

Bulletin 581

BUREAU OF MINES

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# INDEX OF SELECTED GASIFICATION PATENTS

(In Three Parts)

III. Belgian, French, German,  
Italian, and Swedish Patents

Compiled by Simon Klosky and Zane E. Murphy

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# INDEX OF SELECTED GASIFICATION PATENTS

(In Three Parts)

## III. BELGIAN, FRENCH, GERMAN, ITALIAN, AND SWEDISH PATENTS

Compiled by Simon Klosky<sup>1</sup> and Zane E. Murphy<sup>2</sup>

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### *Introduction*

THE Synthetic Liquid Fuels Act (30 U.S.C., 321-325, and amendments) became law April 5, 1944, and a period of intensive research and development in this field was begun by the Bureau of Mines.

As part of this program, bulletins were published on a pressure hydrogenation,<sup>3</sup> the Fischer-Tropsch synthesis,<sup>4</sup> and oil shale.<sup>5</sup>

The Bureau also has published a short bibliography on coal gasification,<sup>6</sup> mostly of a theoretical nature. Because coal gasification is prerequisite to either the Fischer-Tropsch or coal-hydrogenation processes, publishing this sizable collection of technical information in this form will be valuable.

The material is presented in three parts, as follows:

I. United States Patents.

II. United Kingdom, Australian, Canadian, and South African Patents.

III. Belgium, French, German, Italian, and Swedish Patents.

The domestic patents for this bulletin were collected between 1953 and 1955.

Some of the Foreign Patents were collected at the same time and a few of them later in 1961.

Part I was published in 1960; Part II was published in 1962.

WASHINGTON, D.C.  
JUNE 12, 1962

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<sup>2</sup> Chemical engineer, Bureau of Mines, Washington, D.C.

<sup>3</sup> Wiley, J. L., and H. C. Anderson. Bibliography of Pressure Hydrogenation. II. Patents. Bu. Mines Bull. 485, 1951, 236 pp.

<sup>4</sup> Anderson, H. C., J. L. Wiley, and A. Newell. Bibliography of the Fischer-Tropsch Synthesis and Related Processes. II. Patents. Bu. Mines Bull. 544, 1955, 965 pp.

<sup>5</sup> Klosky, Simon. An Index of Oil-Shale Patents. Bu. Mines Bull. 468, 1949, 650 pp.

<sup>6</sup> Busche, R. M., H. R. Batchelder, and W. P. Armstrong. A Selected Bibliography of Coal Gasification. Bu. Mines Rept. of Inv. 4926, 1952, 28 pp.

Work on manuscript completed June 1962.



## BELGIUM PATENTS

Belgium, 366,857

### PROCESS FOR TREATMENT OF SATURATED HYDRO-CARBONS OR OF GASEOUS MIXTURES WHICH CONTAIN THEM

Société d'Etudes Scientifiques et d'Entreprises Industrielles, Ougrée, Belgium

*Jan. 11, 1930. Application filed in Germany. Jan. 14, and July 29, 1929, in the name of M. Voituren. Brussels, 253,505.*

*Cl. E*

A mixture of saturated hydrocarbons, of water vapor, and of oxygen are made to pass at high speed across a reaction chamber, the temperature of which shall be at least 1,300° and the quantity of oxygen being such that the gaseous mixture arising from the reaction shall not contain any notable quantity of unconverted hydrocarbons. The products of the reaction are acetylene, carbonic oxide [CO], and hydrogen.

Belgium 367,040

### PROCESS FOR THE DIRECT OBTAINING OF TOWN GAS BY THE CLASSIFICATION OF COAL

Compagnie Anonyme Continentale pour la Fabrication des Compteurs et Autres Appareils, 53 rue de Birmingham, Brussels, Belgium. Represented by E. Parette, Brussels, Belgium

*Jan. 18, 1930. Application filed in France on Jan. 22, 1929, in the name of the Compagnie Continentale pour la Fabrication des Compteurs et Autres Appareils. Brussels, 253,632.*

*Cl. E*

A mixture is made of industrial gases, for example, whole gasification gas, with hydrogen originating from treatment of water gas extracted in the apparatus producing the industrial gas.

Belgium 367,784

### DISTILLATION PROCESS AND APPARATUS

J. Deschamps, Place Voltaire, Paris, France. Represented by G. Vander Haeghen, Liège, Belgium

*Feb. 14, 1930. Application filed in Germany June 17, 1929. Liège, 25,762.*

*Cl. E*

The products to be distilled are pulverized and distilled in the same crushing apparatus, which is maintained at the desired temperature; distillation can be completed in another apparatus. The operations are effected in the presence of gas or vapor designed to react chemically on the products treated, and serving to carry along the particles of materials.

Belgium 370,999

### IMPROVEMENTS IN THE DISTILLATION OF LIGNITE

Debauche, H., Couillet. Represented by H. and C. Plucker, Brussels, Belgium

*June 11, 1930. Application filed in Great Britain Dec. 17, 1929. Brussels, 256,393.*

*Cl. E*

The lignite is progressively subjected to low-temperature distillation and then to high-temperature distillation; the pieces of semicoke obtained agglomerate easily with a binder, thus producing briquettes or pellets.

The figure (in the original patent) shows an appropriate furnace for this treatment.

Belgium, 371,172

### PROCESS FOR THE PRODUCTION OF WATER GAS AND THE ELIMINATION OF CARBON MONOXIDE FROM SUCH GAS OR ANALOGOUS GASES

Oesterreichisch Amerikanische Magnesite A. G., Radenthein, Carinthia, Austria. Represented by H. and C. Plucker, Brussels, Belgium

*June 17, 1930. Application filed in Austria June 18, 1929. Brussels, 265,515.*

*Cl. E*

The direct catalytic production of mixtures of hydrogen and carbon dioxide containing little or no carbon monoxide is effected in contact with a mixture of oxide, hydroxide, or of magnesium carbonate or of coal at a temperature higher than the dissociation temperature of the magnesium carbonate, but not substantially exceeding 750°.

Belgium 371,946

### PROCESS AND APPARATUS FOR TREATMENT OF FUELS

Hereng, A. J. A., Paris, France. Represented by P. Desguin, Brussels, Belgium

*July 14, 1930. Application filed in France July 18, 1929. Brussels, 257,057*

*Cl. E*

A vertical shaft for receiving the fuel is arranged inside a vertical chamber for evacuating gases supplied by gasification; this vertical chamber empties into a horizontal gasification chamber in which there is an endless conveyor that transports the fuel.

Belgium 373,595

### A PRACTICAL MEANS FOR THE LOW TEMPERATURE DISTILLATION OF COALS, LIGNITES, AND OTHER FUELS

Steven, H., Namur, Belgium

*Sept. 20, 1930. Principal Patent 364,324. Oct. 5, 1929.*

*Cl. E*

The distillation retort is composed of a series of pipes of small diameter; a link chain circulates inside each pipe and carries the coal along a pipe of one row in order to cause it to pass into a pipe of the following row; the coal dried in these pipes passes into those below, where the distillation takes place.

Belgium 374,656

### PROCESS FOR THE PRODUCTION OF GAS

Cohn, H., Berlin, Germany. Represented by H. and C. Plucker, Brussels, Belgium

*Nov. 3, 1930. Application filed in Germany Nov. 2, 1929, and Jan. 28, 1930. Brussels, 258,950.*

*Cl. E*

Gases of lower quality, such as generator-gas or water-gas, are rendered equivalent to illuminating town-gas by the elimination of harmful constituents and by the addition of combustible gaseous constituents. The carbon monoxide is transformed into methane by hydrogen with a nickel catalyzer.

Belgium 374,669

PROCESS FOR OBTAINING LIGHT HYDROCARBONS STARTING FROM COMPLEX ORGANIC COMPOUNDS (TARS, LIGNITES, COALS, ETC.)

Florentin, J. M. F. D., and Kling, A. J., Paris, France. Represented by J. Gevers, Anvers, Belgium

Nov. 4, 1930. Patent, Nov. 21, 1928, under No. 355,982 and applied for in France Nov. 18, 1929.

Cl. E

The transformation of heavy products into light hydrocarbons, in the presence of hydrogen under pressure and of catalyzers, is achieved not only in a liquid phase, but also in the gaseous or mixed phase.

Belgium 374,706

SUPPLEMENTARY COMBUSTION GAS GENERATOR FURNACE

Indugas Industrie und Gasofen-Bau G.m.b.H., Krefeld-Linn am Rhein, Germany. Represented by J. Gevers, Anvers, Belgium

Nov. 5, 1930. Anvers, 18762.

Cl. E

The gas emerging from an intake conduit penetrates by means of burners into a combustion compartment. The heated air arrives from air conduits by means of combustion blast pipes. Further arrival of air from the air ducts takes place inside the heating flues. The completely burned residual gases are collected by means of gas collector ducts and sent on for recovery.

Belgium 375,143

DOUBLE CLOSURE FOR RETORT OVENS FOR THE PRODUCTION OF GAS AND COKE

Limberg, H. J., Essen-Ruhr, Germany. Represented by Jeunehomme et Delbrouck, Brussels, Belgium

Nov. 20, 1930. Application filed in Germany on Dec. 23, 1929, and Oct. 29, 1930 (addition). Brussels, 259,275

Cl. E

A membrane of sheet metal in the form of a framework is locked into place against the boss of the joint of the door framework by means of an asbestos band, one-half of which is applied against the sheet-metal framework while the other half is applied directly to the boss of the joint.

Belgium 376,104

PROCESS FOR THE VAPORIZATION OF RESIDUAL GASES ORIGINATING FROM THE MANUFACTURE OF HYDROGEN BY THE "IRON-WATER-VAPOR" REACTION

Société des Mines de Dourges, Henin-Liétard, France. Represented by G. Vander Haeghen, Brussels, Belgium

Dec. 27, 1930. Application filed in France Feb. 28, 1930. Brussels, 259,933.

Cl. E

The iron oxides resulting from the manufacture of hydrogen by means of the "Iron-Water-Vapor" reaction are reduced by coke-oven gas or by town gas. This gas, at the outlet of the apparatus which produces the hydrogen, is channeled into an oven analogous to a gas retort containing coke maintained, by external heating, at a constant temperature of approximately 1,200°.

Belgium 376,567

PROCESS FOR MANUFACTURING HYDROGEN

Société Anonyme des Ateliers, Générax de Construction, Brussels, Belgium. Represented by J. Bède et Cie., Brussels, Belgium

Jan. 16, 1831. Brussels, 260,247.

Cl. E

Pure hydrogen is obtained by the reaction of water to gas on slaked lime in retorts heated externally; ferric oxide or red hematite may be added to it.

Belgium 378,673

IMPROVEMENTS IN THE PROCESSES FOR THE MANUFACTURE OF CARBON BY DISSOCIATION OF THE CARBON MONOXIDE DERIVED FROM A FUEL TREATED IN A GENERATOR

The General Carbonalpha Co., Wilmington, Del., U.S.A. Represented by G. Vander Haeghen, Brussels, Belgium

Mar. 31, 1931. Application filed in France Apr. 1, 1930.

Cl. E

A circuit for the recovery and manufacture of carbonic gas is combined with the reaction circuit by using the gas produced during the blowing period, this carbonic gas being introduced as an addition to the main gaseous stream before the generator.

Belgium 379,075

IMPROVEMENTS IN THE OVEN FOR THE DISTILLATION OF COAL AT LOW TEMPERATURE

Dryon, P., Auveldis, Belgium. Represented by F. Michaux, Brussels, Belgium

Apr. 15, 1931. Brussels, 261,929.

Cl. E

A series of cells suitable for receiving the material to be distilled are arranged in the form of a continuous unit, for example, in the form of moveable rings encircling and delimiting one or several spaces through which a heating agent passes; these cells are subjected to heating action increasing progressively from the charge point to the discharge point. The open spaces which occur between the cells permit access of the heating agent to several and up to five of their surfaces.

Belgium 379,412

PROCESS AND DEVICE FOR THE MANUFACTURE OF GAS LOW IN CARBON MONOXIDE

Bossner, F., and Marischka, C., Gaswerk Simmering and Gaswerk Leopoldau, respectively, both of Vienna, Austria. Represented by J. Bède & Cie, Brussels, Belgium

Apr. 28, 1931. Filed in Austria Apr. 28, 1930. Brussels, 262,208.

Cl. E

The invention consists of a process of purification of town gas in order to remove from it all or most of the carbon monoxide which it contains. Elimination takes place by the action of lime at 500° in the presence of water vapor, which transforms this oxide into carbonate. Regeneration of the lime is next obtained by calcination of the carbonate of lime at a temperature of 800° to 900°. Regeneration takes place during the gas-production phase, a fact which makes it possible to use a portion of the reaction heat for the regeneration.

Belgium 379,672

PROCESS AND INSTALLATION FOR THE MANUFACTURE OF HYDROGEN AND SIMILAR GASES

L'Oxydrique Française (Sté.), Malakoff, France. Represented by H. and C. Plucker, Brussels, Belgium

May 8, 1931. Patented in France Mar. 25, 1929. Brussels, 262,391.

Cl. E

The installation includes a cylindrical generator equipped with rotating blades and in which is one of the reagents, such as caustic soda. The other reagent, ferrosilicon, is located in a reservoir, the lower part of which is equipped with a regulatable distributor. Above the generator there is a steam dome by means of which the hydrogen gas produced goes into a condenser. The gaseous hydrogen next goes into a gas tank by the means of a duct and a valve.

Belgium 380,106

## PROCESS AND DEVICE FOR TREATMENT OF SOLID FUELS

Hereng, A. J. A., Paris. Represented by P. Desguin, Brussels, Belgium

*June 26, 1931. Application filed in France May 30, 1930. Brussels, 262,655.*

Cl. E

The fuel, to be treated by distillation advances gradually through the furnace, is spread out in a bed on a horizontal conveyor, which is permeable by gas, and which is subjected on its lower surface to exhaust action which removes the distillation gases as they are produced. When the fuel has executed a part of its course, the crust which has been formed at the upper part of the fuels is disintegrated by rotating teeth.

Belgium 380,576

## PROCESS FOR THE DISTILLATION OF LIGNITE

Szigeth, G., Budapest, Hungary. Represented by G. Vander Haeghen, Brussels, Belgium

*June 15, 1931. Application filed in Hungary June 25 and July 10, 1930. Brussels, 263,012.*

Cl. E

The gases liberated by a highly heated zone of the charge are evacuated in such a way that the water vapor and the carbonic acid formed during the first heating cycle are transformed into permanent gases in the course of their passage through the highly heated charge, and that the tars as well as the hydrocarbons are decomposed.

Belgium 383,466

## IMPROVEMENTS IN THE PROCESSES AND IN THE RETORTS FOR THE DISTILLATION OF COAL

The Stevens Co., Mich., U.S.A.. Represented by G. Vander Haeghen, Brussels, Belgium

*Oct. 15, 1931. Brussels, 264,966*

Cl. E

The retort includes devices for the continuous introduction of coal, the continuous evacuation of coke, and a device for causing an electric current to pass through the mass, heating it from the inside toward the outside, the coke being the resistance element of the current.

Belgium 385,449

## IMPROVEMENTS IN THE PROCESSES AND INSTALLATIONS FOR THE BURNING AND DISTILLING AT LOW TEMPERATURE OF SOLID FUELS

Compagnie des Mines d'Aniche et Dubrulle (G.E.), both at Aniche, France. Represented by G. Vander Haeghen, Brussels, Belgium

*Jan. 6, 1932. Brussels, 266,325*

Cl. E

The materials to be distilled are placed in direct contact with a gaseous fluid circulating in a closed circuit between a retort that contains the materials and a source of heat such as, for example, a chamber in which the incandescent coke is discharged coming from a battery of coke ovens and which serves at the same time for the extinguishment of the coke.

Belgium 382,498

## PROCESS FOR THE PRODUCTION OF CARBURETED WATER GAS

C. Otto &amp; Co., G.m.b.H., Bochum, Germany

*Sept. 5, 1931. Application filed in Germany Sept. 22, 1930, and Feb. 13, 1931. Brussels, 264,338.*

Cl. E

At the completion of the distillation of the coal in the coking chambers, water vapor is introduced onto

the incandescent surface of the coke by sprayers arranged inside the covers of the filling holes; the water gas formed is exhausted by means of pipes plunging into the mass; after a certain time, tar is introduced as well, and this tar is pulverized by the steam under pressure.

Belgium 382,512

## PROCESS OF COKING OR DISTILLATION OF FUELS

Metallgesellschaft A.G., Frankfurt am Main, Germany.

Represented by E. Laguesse-Hamal, Liège, Belgium

*Sept. 5, 1931. Application filed in Germany Sept. 11 and 17, 1930. Liège, 26,806*

Cl. E

The mixture of fuel with or without addition is fired on a rolling grid, then coked or distilled by introduction of air through pressure or through suction, and then cooled by aspersion of water. Coking or distillation may be effected simultaneously in superimposed layers of fuel.

Belgium 386,312

## PROCESS FOR PREPARATION OF MIXTURES SUITABLE FOR METHANE SYNTHESIS OR HYDROCARBONS DERIVED FROM METHANE

Padovani, C., Piazza Leonardo da Vinci, Milan, Italy.

Represented by H. and C. Plucker, Brussels, Belgium

*Feb. 8, 1932. Brussels, 266,897.*

Cl. E

The mixture to be obtained is: 2 volumes of H for 1 volume of CO. Starting from CH<sub>4</sub>, a part of the latter is oxidized in such a way as to obtain a mixture containing one gram-molecule of CO<sub>2</sub> per two gram-molecules of water, and this mixture is set in motion over the appropriate catalyzers and at the appropriate temperatures.

Belgium 386,469

## IMPROVEMENT IN THE MANUFACTURE OF ENRICHED WATER GAS

Humphrey &amp; Glasgow, Ltd., and Griggs, A. R., Westminster, England. Represented by H. and C. Plucker, Brussels, Belgium

*Feb. 15, 1932. Application filed in Great Britain Aug. 7, 1931. Brussels, 266,997.*

Cl. E

After an ascending blast of air such in the peripheral zone of the fuel bed attains a temperature higher than the central zone, tar is spread only on the said peripheral zone and a descending draft is created so that the vapors and gases of the tar shall, in traversing the fuel, undergo cracking in the presence of excess water gas and steam.

Belgium 387,055

## PROCESS OF MANUFACTURE OF GASEOUS MIXTURES SUITABLE FOR VARIOUS SYNTHESSES

Chaffette, M., Hologne-aux-Pierres. Represented by G. Vander Haeghen, Liège, Belgium

*Mar. 9, 1932. Liège, 27,147.*

Cl. E

The invention consists of manufacturing a mixture of hydrogen, carbon monoxide, and carbon dioxide starting from methane, from water vapor, and from oxygen. Incomplete combustion of the methane is effected at a high temperature, and then the gaseous mixture thus obtained is passed, after possible addition of steam, over a catalyzer at a temperature which shall not be less than 500°.

Belgium 387,252

**IMPROVEMENTS IN THE APPARATUS FOR DISTILLING COAL AND ANALOGOUS CARBONATED SUBSTANCES**Low Temperature Carbonisation, Ltd., London, England.  
Represented by J. Gevers at Antwerp, Belgium*Mar. 19, 1932. Application filed in Great Britain on Apr. 20, 1931. Antwerp, 20,926.*  
*Cl. E*

The invention consists of apparatus in which the coal is first distilled in an upper heated retort, then passes into a lower retort. The gases or steam are drawn off from the latter by a duct provided inside or alongside the upper retort.

Belgium 387,296

**PROCESS FOR PREPARATION OF GASEOUS MIXTURES RICH IN HYDROGEN, CARBON MONOXIDE, AND CARBON DIOXIDE**

Chaffette, M., Hollogne-aux-Pierres. Represented by G. Vander Haeghen, Liège, Belgium

*Mar. 19, 1932. Liège, 27,167.*  
*Cl. E*

Methane or gases containing it are decomposed by steam at temperatures of at least 500°, in the presence of a catalyzer constituted by mixtures with a base of nickel and of metals of the rare earths group, particularly of the ceric earths group.

Belgium 387,470

**PROCESS FOR THE DISTILLING OF FUELS**

Depuy, H., Paris, France. Represented by E. Dellicour, Liège, Belgium

*Mar. 26, 1932. Application filed in France Apr. 3, 1931, and Jan. 19, 1932. Liège, 27,186.*  
*Cl. E*

For starting, or in the event the liberation of hydrocarbons is insufficient, a fuel gas borrowed from an outside source is used, in such fashion that the use of a supercharger is unnecessary.

Belgium 390,577

**IMPROVEMENTS IN THE GASIFICATION OF HEAVY OILS, NOTABLY BY COOLING OF THE GAS OBTAINED**

Huard, F. P., Paris, France. Represented by J. Gevers, Antwerp, Belgium

*Aug. 23, 1932. Antwerp, 21,561.*  
*Cl. E*

The gas is cooled suddenly to a temperature greatly lower than the condensation temperature of the tar which it contains by an injection of steam under pressure into the gas, through an opening made in the pipe linking the gasifier with the washer, in such a way that it forms an annular vein separating this pipe into two parts, the high-temperature region of which it insulates.

Belgium 390,578

**IMPROVEMENTS IN THE GASIFICATION OF HEAVY OILS**

Huard, F. P., Paris, France. Represented by J. Gevers, Antwerp, Belgium

*Aug. 23, 1932. Antwerp, 21,562.*  
*Cl. E*

A permeable body with a broad surface and slight thickness such as a grid [or grate] is placed in the gasification chamber, on the course of one or several jets of a gaseous mixture, and this grid radiates toward the origin of the jets the heat from the gases heated by their passage through it.

Belgium 394,121

**IMPROVEMENTS IN VERTICAL RETORTS FOR CARBONIZATION OF COAL AND ANALOGOUS MATERIALS**

West, F. J.; West, E.; and West's Gas Improvement Co., Ltd., Manchester, England. Represented by J. Bède &amp; Cie., Brussels, Belgium

*Feb. 3, 1933. Application filed in Great Britain on Mar. 12, 1932. Brussels, 272,032.*  
*Cl. E*

The retort includes a retorting chamber, an intermediate chamber and a cooling chamber. The latter can be divided into two by a valve integral with the extremity of the wall and provided with a rack maneuverable with the aid of a pinion. A discharge valve is shutdown by the turning of a cutoff plate which can revolve around a shaft.

Belgium 395,924

**IMPROVED PROCESS FOR LOW TEMPERATURE CARBONIZATION OF COAL**

Caunt, W. A., Hamilton, Ontario, Canada. Represented by G. Etienne, Brussels, Belgium

*Apr. 26, 1933. Brussels, 273,291.*  
*Cl. E*

The material is conducted by a screw, in a continuous fashion, into a slightly inclined rotating retort, and is heated there at such a temperature that the carbonized material forms a core which cokes progressively and does not adhere to the walls; this core is broken up by balls or hammers near the end of the discharge point.

Belgium 396,955

**IMPROVEMENTS IN THE PROCESSES OF CARBONIZATION OF SOLID FUELS AT LOW TEMPERATURE**

British Carbonised Fuels, Ltd., and Hird, H. P., Bradford, Great Britain. Represented by A. Hamssens, Brussels, Belgium

*June 15, 1933. Application filed in Great Britain June 16, 1932. Brussels, 273,969.*  
*Cl. E*

A series of rectangular retorts with conical walls are heated by a circulation system including intake and exhaust passages, a blower, and a gas intake on the pressure side of the blower. The temperature of the carbonized coal does not exceed 420°.

Belgium 397,899

**PROCESS AND APPARATUS FOR THE MANUFACTURE OF GAS**

Air Reduction Co., Inc., New York, N.Y., U.S.A. Represented by A. Hamssens, Brussels, Belgium

*July 27, 1933. Brussels, 274,592.*  
*Cl. E*

Oxygen and a carburated fuel are continuously conveyed to a heated reaction chamber where the carbon is partially transformed into carbon monoxide, the remainder being treated by steam, conveyed into the chamber in a limited quantity so as to produce only carbon monoxide and hydrogen.

Belgium 398,347

**PROCESS AND OVEN FOR LOW TEMPERATURE CARBONIZATION IN RETORTS**

International Holding de Distillation et de Cokéfaction à Basse Température et Minière, Brussels. Represented by H. and C. Plucker, Brussels, Belgium

*Aug. 28, 1933. Application filed in France Apr. 4, 1933. Brussels, 274,886.*  
*Cl. E*

Vertical retort chambers are each placed in hookup



to a return pipe serving to convey to one extremity of the chamber the heat of the exhausted gases emerging at the other extremity thereof, a burner being supplied at the return extremity to furnish additional heat.

Belgium 398,773

PROCESS AND APPARATUS FOR THE OBTAINING OF OIL GAS

Carburetted Gas, Inc., Dover, Del., U.S.A. Represented by E. Laguesse-Hamal, Liège, Belgium

*Sept. 23, 1933. Liège, 28,013.  
Cl. E*

The generator contains an annular vertical chamber, partially filled with contact material and into which, at the top part, oil and steam are injected, and into the lower part, enriching hydrocarbons. A chamber is surmounted with a dome, partially filled with contact material; the oxide mixture of carbon and hydrogen traverses this contact material, the said mixture originating from the combustion of the oil and the oxygen injected into the dome. The various mixed gases are evacuated by the central pipe.

Belgium 398,774

PROCESS OF MANUFACTURE OF OIL GAS

Carburetted Gas, Inc., Dover, Del., U.S.A. Represented by E. Laguesse-Hamal, Liège, Belgium

*Sept. 23, 1933. Application filed in the U.S.A. Oct. 22, 1932, in the name of T. Nagel. Liège, 28,014.  
Cl. E*

The oil enters under pressure into a distillation boiler in such a way as to remain liquid; the hot oil next enters into a vaporizing chamber in which it is gasified, thus yielding oil gas. The coke is deposited in a shaft and the oil gas is cracked in order to yield simple noncondensable hydrocarbons.

Belgium 398,775

PROCESS FOR MANUFACTURE OF FUEL GAS

Carburetted Gas, Inc., Dover, Del., U.S.A. Represented by E. Laguesse-Hamal, Liège, Belgium

*Sept. 23, 1933. Application filed in U.S.A. Jan. 26, 1933, in the name of T. Nagel. Liège, 28,015.  
Cl. E*

Oil and oxygen are introduced continuously into a generator in such fashion as to obtain carbon monoxide and hydrogen in the hot zone. The mixture produced passes into a carburetor after addition of hydrocarbons. The temperature is regulated by introducing water vapor and oil, which also gives rise to the oxide mixture of carbon and hydrogen.

Belgium 398,776

PROCESS FOR MANUFACTURING GAS STARTING WITH OIL

Carburetted Gas, Inc., Dover, Del., U.S.A. Represented by E. Laguesse-Hamal, Liège, Belgium

*September 23, 1933. Application filed in the U.S.A. June 6, 1933, in the name of Th. Nagel. Liège, 28,016.  
Cl. E*

In a receptacle filled with refractory material, air and oil are burned, introduced at the top part of the receptacle in such fashion that carbon is deposited. After combustion of a part of the carbon, steam is introduced and the gases obtained are directed toward a gas holder.

Belgium 398,919

LOW-TEMPERATURE CARBONIZATION OVEN

Société d'Etudes et de Valorisation Industrielle des Combustibles, Paris, France. Represented by H. and C. Plucker, Brussels, Belgium

*Oct. 2, 1933. Application filed in France Oct. 6, 1932. Brussels, 275,276.  
Cl. E*

The oven contains a single heating chamber in which tubular elements are arranged on horizontal planes and tiered; these elements contain a central section equipped with mixtures and propellers and they discharge at one end into a common collector. Heating gases circulate in the passages created between the elements.

Belgium 401,637

PROCESS AND APPARATUS FOR THE TREATING OF CARBONACEOUS MATERIALS AND PROCESSES FOR FORMING THE CHARGES FOR SUCH TREATMENT

Reilly, P. C., Indianapolis, Ind., U.S.A. Represented by F. Michaux, Brussels, Belgium

*Feb. 24, 1934. Brussels, 277,089.  
Cl. E*

The carbonaceous material (coal, lignite, wood, or pitch) is arranged in a charge in a vertical stack around ducts which traverse it from top to bottom. The upper portion of the load is put into contact with a gaseous agent which causes the distillation of the carbonaceous material. The products resulting therefrom are exhausted through the charge by means of the ducts and empty into a collector located at the base of the oven.

Belgium 402,166

PROCESS OF REACTION OF CARBON MONOXIDE WITH WATER VAPOR

Oesterreichisch Amerikanische Magnesit, A. G., Radenthein, Carinthia, Austria. Represented by H. and C. Plucker, Brussels, Belgium

*Mar. 22, 1934. Application filed in Austria Mar. 24, 1933. Brussels, 277,440.  
Cl. E*

The production of water gas is accomplished under high pressure by using a catalyzer formed of carbonated magnesium oxide. The operation takes place in two phases, the first of which occurs between 400° and 500°, and the second between 400° and 320°.

Belgium 403,506

PROCESS FOR THE PRODUCTION OF HYDROGEN GAS BY CONVERSION OF WATER GAS

Natta, G., Paire, Italy. Represented by L. Bercovici, Brussels, Belgium

*June 4, 1934. Application filed in Italy June 13, 1933. Brussels, 278,346.  
Cl. E*

A catalyzer is used constituted of carbon of mineral zinc [zinc spar], possibly calcined, and possibly diluted with hydrates or alkaline carbonates.

Belgium 403,736

PROCESS FOR OBTAINING ILLUMINATING GAS, RICH IN HYDROGEN AND VIRTUALLY FREE OF CARBON MONOXIDE, STARTING WITH SOLID FUELS

Gesellschaft für Linde's Eismaschinene A. G., Holtrieglkreuth bei Munich, Germany. Represented by J. Bède et Cie, Brussels, Belgium

*June 16, 1934. Application filed in Germany on June 24, 1933. Brussels, 278,506.  
Cl. E*

The fuel is gasified under pressure with oxygen obtained by separation of air and with water vapor;

the cooled gas is washed with liquified nitrogen originating from the separation of the air.

Belgium 404,942

**CATALYZER FOR EFFECTUATING THE REACTION OF WATER GAS AND ITS MANUFACTURING PROCESS**

Non-Poisonous Gas Holding Co., Ltd., Vaduz-Lichtenstein, Germany. Represented by E. Laguesse-Hamal, Liège, Belgium

*Aug. 27, 1934. Liège 28,449.*

*Cl. E*

A mixture of an iron compound (ferric hydroxide) and of a substance having an activating action (sodium carbonate) is rendered solid by means of a dehydrating binder (cement).

Belgium 406,999

**IMPROVEMENT IN THE DISTILLATION OF CARBONACEOUS MATERIALS**

Holford, H. J., Southampton, Great Britain. Represented by J. Bède & Cie., Brussels, Belgium

*Dec. 24, 1934. Application filed in Great Britain Jan. 5, 1934. Brussels, 280,713.*

The distillation of the pulverized carbonated material (coal) takes place with the aid of superheated steam and of outside heat introduced while the material is arranged on shelves through the heating zone. The products of gaseous decomposition are collected and passed on toward the condenser.

Belgium 407,446

**PROCESS FOR OBTAINING A MIXTURE OF NITROGEN AND HYDROGEN BY GASIFICATION OF CARBON UNDER PRESSURE**

Ammoniaque Synthétique et Dérivés, Brussels, Belgium. Represented by V. Auerbach, Brussels, Belgium

*Jan. 23, 1935. Brussels, 281,020.*

*Cl. E.*

The coal under pressure is gasified by a mixture of steam and air, preheated in a converter surrounding the gas holder. The gas formed is treated to eliminate any small quantities of carbon dioxide and other impurities. The treated gas is used for the manufacture of ammonia.

Belgium 409,362

**DISTILLATION RETORT MOUNTED IN A BYPRODUCT COKE OVEN FOR THE PRODUCTION OF COKE AND GAS**

Carl Still, G.m.b.H., Recklinghausen, Germany. Represented by H. and C. Plucker, Brussels, Belgium

*May 8, 1935. Application filed in Germany May 16, 1934. Brussels, 282,346*

*Cl. E.*

One or several vertical steel retorts, from which the charge is drawn out from below, are freely suspended from the dome of the chamber; the upper extremity of each retort bells out toward the top in the form of a funnel.

Belgium 410,219

**IMPROVEMENTS IN APPARATUS INTENDED FOR THE CARBONIZATION OR THERMIC TREATMENT OF SOLID MATERIALS**

The Illingworth Carbonization Co., Ltd., Manchester, England. Represented by F. Michaux, Brussels, Belgium

*July 3, 1935. Application filed in Great Britain Aug. 17, 1934, in the name of S. R. Illingworth. Brussels, 282,880.*

*Cl. E*

The invention particularly concerns a retort for the carbonization of coal at low temperature. The material is transported into the heating chamber of the retort, the bed plate of which is surmounted by a metal framing. The latter serves as a pivot support for a

frame equipped with plunger arms which go through the openings made in the wall of the bed plate and which are equipped with small transverse joists on which the heating grates are suspended.

Belgium 410,541

**IMPROVED INSTALLATION OF RETORTS FOR THE RETORTING OF SOLID CARBONACEOUS MATERIALS**

Low Temperature Carbonisation, Ltd., London, England. Represented by J. Gevers, Antwerp, Belgium

*July 24, 1935. Application filed in Great Britain Aug. 21, 1934. Antwerp, 24,994.*

*Cl. E*

Ducts are arranged in the upper part of the combustion chambers, and they are traversed by the heating gases after their passage into the combustion chambers. Furthermore, the upper duct is equipped with intake orifices by means of which the gas enters into the set of ducts in order to traverse the latter.

Belgium 410,542

**IMPROVED INSTALLATION OF RETORTS FOR THE RETORTING OF SOLID CARBONACEOUS MATERIALS**

Low Temperature Carbonisation, Ltd., London, England. Represented by J. Gevers, Antwerp, Belgium

*July 24, 1935. Application filed in Great Britain, Aug. 21, 1934. Antwerp 24,993.*

*Cl. E*

The combustion chambers, arranged between the pairs of retorts, are equipped with two adjacent gas ducts, by means of which the gas is separately distributed, under independent regulation, to the chambers of each pair of chambers. Air-stabilizing chambers are arranged between these ducts.

Belgium 412,861

**APPARATUS FOR THE PRODUCTION OF COKE, GAS, AND BYPRODUCTS AT LOW OR MEDIUM TEMPERATURES**

Gas Chambers & Coke Ovens, Ltd., and Kemp, A. V., Westminster, London, England. Represented by L. Bercovici, Brussels, Belgium

*Dec. 18, 1935. Brussels, 284,868.*

*Cl. E*

Several ovens are enclosed in hollow walls each containing several heating flues. The space between the adjacent walls of two neighboring ovens forms a series of combustion chambers each of which is separately connected to two heating flues arranged on either side of the chamber; these flues are connected, one after the other, directly to a common pipe.

Belgium 414,501

**IMPROVEMENTS IN METHODS OF USING COAL GAS OR ANALOGOUS GASES**

Hans, A. J. E., Ougrée, Belgium. Represented by A. Passagèz, Liège, Belgium

*Mar. 19, 1936. Liège, 29,094.*

*Cl. E*

The coke-oven gas is subjected to oxidation cracking at a very high temperature in the presence of oxygen and water vapor. The cracked gas is used in synthesis of ammonia or for any other hydrogenation operation.

Belgium 416,456

**PROCESS FOR PRODUCING A PURE MIXTURE, COMPOSED OF CARBON MONOXIDE AND HYDROGEN**

Lichtenberger, T., and Kaiser, L., Stuttgart, and 4 Schlossstrasse, Herbede-Ruhr, Germany, respectively. Represented by J. Gevers, Antwerp

*July 9, 1936. Antwerp, 26,169.*

*Cl. E*

Fuel and water vapor are highly heated in a gas

holder. The resulting gases are recovered after having traversed the fuels under their own pressure, and are directed through a saline bath in order to transform the remainder of the elements into carbon monoxide and into hydrogen.

Belgium 417,379

**IMPROVEMENTS IN THE OVENS FOR DISTILLING OF COAL OR LIGNITE AT LOW TEMPERATURE**

Tassarca, F., Genoa, Italy. Represented by E. Laguesse-Hamal, Liège

*Sept. 10, 1936. Application filed in Italy Nov. 4, 1935, and Nov. 21, 1935—addition. Liège, 29,305.*

*Cl. E*

The material is placed in metal cases subdivided by vertical metal diaphragms. The cases are placed in refractory retorts separated from each other by spaces in which combustion of the heating gases is effected.

Belgium 417,743

**PROCESS FOR PREPARATION OF HYDROGEN BY REACTION OF CARBON MONOXIDE, OR OF GASEOUS MIXTURES CONTAINING CO, WITH STEAM**

Oesterreichisch Amerikanische Magnesit, A. G., Radentheim, Carinthia, Austria. Represented by H. and C. Plucker, Brussels, Belgium

*Oct. 2, 1936. Application filed in Austria Oct. 23, 1935. Brussels, 288,144.*

*Cl. E*

The catalyzer is composed of magnesium oxide, of potassium carbonate, of carbonaceous materials, as well as of ferric oxide in the form of iron ores.

Belgium 418,230

**PROCESS FOR CATALYTIC TRANSFORMATION OF CARBON MONOXIDES, BY MEANS OF HYDROGEN INTO SUPERIOR HYDROCARBONS**

Ruhrchemie A. G., Oberhausen, Holton, Germany. Represented by A. Hanssens, Brussels, Belgium

*Nov. 4, 1936. Application filed in Germany Dec. 10, 1935, Dec. 31, 1935, and Apr. 7, 1936—additions.*

*Cl. E*

The regeneration of the catalyzer, the activity of which becomes weakened by the deposit of the non-volatile products, takes place in the synthesis oven and in the range of temperatures used for the synthesis, with the aid of hydrogen, of steam, or of solvents.

Belgium 418,364

**IMPROVED METHODS FOR DISTILLING COAL AND OTHER CARBONACEOUS MATERIAL**

Morgan, J. S., Rodridge Hall, Near Wingate, Great Britain. Represented by G. Vander Haeghen, Brussels, Belgium

*Nov. 12, 1936. Application filed in Great Britain Nov. 12, 1935. Brussels, 288,551.*

*Cl. E*

The carbonaceous material is closely mixed and stirred with incandescent coke, and a part of the coke produced is removed intermittently or continuously.

Belgium 419,822

**IMPROVEMENTS IN THE DISTILLATION AND IN THE APPARATUS FOR DISTILLING SOLID CARBONACEOUS MATERIALS**

British Coal Distillation, Ltd., Broadway, Westminster, England. Represented by J. Gevers, Antwerp, Belgium

*Feb. 4, 1937. Application filed in Great Britain Mar. 20, 1936, by R. D. Hardy, C. Macheu, and E. H. G. Aram. Antwerp, 26,789.*

*Cl. E*

The material subjected to treatment passes outside

pipes in direct contact with a controlled volume of heating gas which is sufficient to sweep along in suspension the vapors freed, the complement of heat for effecting the treatment being applied to the interior of the pipes.

Belgium 420,504

**LOW TEMPERATURE CARBONIZATION OVEN**

Boulanger, L., Brussels, Belgium. Represented by Jeune-homme et Delbrouck, Brussels, Belgium

*Mar. 11, 1937. Brussels, 289,965.*

*Cl. E*

The fuel is progressively displaced in a stationary metal drum, by a conveyor screw; the drum and the screw are horizontally supported in a chamber traversed by the heating gases which circulate, in the lower part, in a direction inverse to the advancement of the fuel.

Belgium 421,880

**PROCESS FOR THE LOW-TEMPERATURE DISTILLATION OF FUELS IN OVENS WITH VERTICAL CHAMBERS**

C. Otto & Co., G.m.b.H., Bochum, Germany. Represented by G. Vander Haeghen, Brussels, Belgium

*June 2, 1937. Application filed in Germany July 18, 1936, and Feb. 13, 1937. Brussels, 290,937.*

*Cl. E*

Metal jacketings composed of U-bars or I-bars extend over the entire surface of the wall of the chambers and subdivide the latter into continuous vertical chambers, the extent of which in the transverse direction is a multiple of their width. The heating chambers operate at temperatures corresponding to coking at high temperature.

Belgium 424,183

**CONTINUOUS PROCESS FOR THE DISTILLATION OF COAL IN A CLOSED VESSEL**

National Fuels Corporation, New York, N.Y., U.S.A. Represented by A. Hanssens, Brussels, Belgium

*Oct. 20, 1937. Application filed in the U.S.A. Oct. 24, 1936, in the name of G. A. Berry. Brussels, 292,475.*

*Cl. E*

Bituminous coal is heated in a series of temperature zones, and this heating is effected by contact with hot gases which do not react with the coal. The rate of heating in the second 500° to 600° zone is maintained at a point below which the treated coal would swell. During the heating the coal is displaced in the [heating] zone in a direction opposite to the heating gas.

Belgium 424,934

**PROCESS AND OVEN FOR THE DISTILLATION OR SEMI-CARBONIZATION OF MATERIALS CARBONIZABLE AT A LOW TEMPERATURE**

Kainscop, D., Paris, France. Represented by A. Hanssens, Brussels

*Nov. 30, 1937. Application filed in France Dec. 2, 1936. Brussels, 292,974.*

*Cl. E*

The material runs successively through an upper drying and preheating hearth and a lower distillation hearth, in a bed measuring approximately 50 mm. constantly stirred and turned by oscillating shovels; the two hearths are heated countercurrently by the gases of a single fire chamber, in which gases successively run through the subjacent flue of the lower hearth and the closed compartments of the upper hearth.

Belgium 426,651

PROCESS FOR PREPARATION OF GASEOUS MIXTURES, RICH IN HYDROGEN, BY PARTIAL COMBUSTION OF METHANE WITH OXYGEN

Gesellschaft für Linde's Eismaschine A.G., Hölriegelskreuth Gei, Munich, Germany. Represented by J. Bède et Cie, Brussels, Belgium

Feb. 26, 1938. Application filed in Germany Mar. 20, 1937.  
Cl. E

Oxygen is diluted by means of gases (methane, water vapor), the products of reaction of which with the gases and the oxygen are the constituents of the gaseous mixture rich in hydrogen which is to be produced.

Belgium 427,663

IMPROVEMENTS IN DISTILLATION OVENS FOR THE PRODUCTION OF SYNTHESIS GAS

Fiorelli, F., Spoleto, Italy. Represented by E. Laquesse-Hamcl. Liège, Belgium

Apr. 19, 1938. Application filed in Italy, Apr. 23, 1937.  
Liège, 29,968.  
Cl. E

The distillation oven is connected to apparatus for drying the fuel and gasifying the coke. It is formed of vertical chambers joined to each other and subdivided, in the lower part, into interior compartments, for high-temperature distillation, and into exterior compartments containing desulphurizing material.

Belgium 428,595

PROCESS AND DEVICE FOR THE PRODUCTION OF A GASEOUS MIXTURE ON THE BASIS OF VAPORS OF HYDROCARBONS

Schachtel, H., Antwerp, Belgium. Represented by G. Vander Haeghen. Antwerp, Belgium

June 14, 1938. Antwerp, 28,638.  
Cl. E

The air is carbureted by mixing a dispersion of compressed air at room temperature into a mass of hydrocarbon.

Belgium 431,706

IMPROVEMENTS IN THE OPERATING PROCESS OF VERTICAL CARBONIZATION RETORTS

Woodall Duckham (1920) Ltd., London, England. Represented by E. Laquesse-Hamcl. Liège, Belgium

Dec. 16, 1938. Application filed in Great Britain Aug. 3, 1938, in the names of H. H. Carey and S. G. Vane. Liège 30,207.  
Cl. E

A cushion or layer of coke, designed to separate the coke column in the retort from the new charge of coal, is placed at the top of the coke column in the retort before causing this column to descend so that the new charge of coal can be introduced.

Belgium 431,707

IMPROVEMENTS IN THE OPERATING PROCESS OF VERTICAL CARBONIZATION RETORTS

Woodall Duckham (1920), Ltd., London, England. Represented by E. Laquesse-Hamcl. Liège, Belgium

Dec. 16, 1938. Application filed in Great Britain Aug. 16, 1938, in the names of H. H. Carey and T. C. Finlayson. Liège, 30,208.  
Cl. E

The relative proportions of the coal and the residual coke are regulated between the limits of the heating zone of the retort, and water vapor is made to pass through that zone in order to produce water gas upon contact with the heated coke.

Belgium 434,042

PROCESS FOR INCREASING THE PRODUCTION OF HYDROCARBONS IN THE HIGH-TEMPERATURE COKING OF FOSSIL COALS

Gelsenkirchener Bergwerks A.G., Essen, Germany. Represented by Jeunehomme and Delbrouck, Brussels, Belgium

Apr. 27, 1939. Brussels, 299,075.  
Cl. E

Gas is introduced into the oven shortly after charging and until the maximum value of gas development shall have been exceeded; the gas inlet tuyères penetrate into the charge in the vicinity of the hearth of the furnace.

Belgium 435,085

PROCESS AND APPARATUS FOR THE DISTILLATION OF COAL, LIGNITE, SHALE, AND THE LIKE

DuSaugey, H., Boulogne-sur-Seine, France. Represented by J. Bède and Cie., Brussels, Belgium

June 24, 1939. Application filed in France June 30, 1938. Antwerp, 299,757.  
Cl. E

The apparatus includes a central enclosure into which the material to be distilled descends; an interior heating enclosure; and an exterior enclosure, separated from the first by a perforated wall, which receives the distillation gases.

Belgium 435,415

COKE OVEN

Puening, F., Claygate, Great Britain. Represented by H. and C. Pluecker, Brussels, Belgium

July 12, 1939. Application filed in Great Britain July 16, 1938. Brussels, 299,965.  
Cl. E

The coking chambers are formed between movable sidewalls internally heated, and are individually shut-off in an air-tight manner, except for an outlet for the distillates; the chambers are opened by moving the side walls.

Belgium 436,077

PROCESS FOR THE MANUFACTURE OF MIXTURES OF HYDROGEN AND CARBON MONOXIDE PREPARED FOR THE SYNTHESIS OF GASOLINE ACCORDING TO THE FISCHER TROPSCH METHOD

Gesellschaft für Linde's Eismaschinen A. G., Hölriegelskreutz, Germany. Represented by J. Bède and Co., Brussels, Belgium

Aug. 22, 1939. Application filed in Germany Aug. 22, 1938. Brussels, 300,392.  
Cl. E

Gaseous mixtures rich in hydrogen and carbon dioxide are cooled to the dewpoint of the latter, in periodically reversing cold accumulators.

Belgium 436,705

PROCESS FOR THE PRODUCTION OF HYDROGEN AND CARBON MONOXIDE

Koppers N. V., Amsterdam, Netherlands. Represented by Jeunehomme et Delbrouck, Brussels, Belgium

Oct. 17, 1939. Application filed in Germany Oct. 17, 1938, in the name of Heinrich Koppers G.m.b.H. Brussels, 300,781.  
Cl. E

The mixture of gas and water vapor and/or of carbonic acid which is to be decomposed, is led into the heat accumulator at the final reaction temperature by progressive heating in such fashion that the temperature difference between the gaseous mixture and the internal lining of the accumulator shall not exceed 300°.

Belgium 437,631

## PROCESS FOR THE CONVERSION OF LUBRICATING OILS INTO FUEL FOR DIESEL ENGINES

Gazan, M. H., Brussels. Represented by A. Hanssens, Brussels, Belgium

*Jan. 10, 1940. Brussels, 301,429.*

Cl. E

The oils are treated, in the vapor state, by an oil of aluminum obtained by the Gustavson or by the Friedel and Crafts reaction on paraffinic bodies.

Belgium 439,398

## ELECTROTHERMIC APPARATUS AND PROCESS FOR GENERATION OF GAS

Société d'Electricité e de Mécanique Procédés Thomas-Houston, Van den Kerchove et Carels, S.A., Brussels, Belgium. Represented by E. Dussart, Brussels, Belgium

*Oct. 1, 1940. Application filed in the U.S.A. May 23, 1939, in the name of C. G. Suits. Brussels, 302,641.*

Cl. E

The gases produced are hydrogen, acetylene, carbon monoxide, and, in general, illuminating and fuel gases. The base material to be carbureted is immersed in the form of particles in electrical contact in water and subjected to successive electrical discharges of very short duration extinguished by the gases discharged.

Belgium 440,640

## PROCESS FOR THE PARTIAL COMBUSTION OF METHANE WITH A VIEW TO THE PRODUCTION OF CARBON MONOXIDE AND HYDROGEN

Gesellschaft für Linde's Eismaschinen A.G., Höllriegelkreuz bei Munich, Germany. Represented by J. Bède et Cie., Brussels, Belgium

*Feb. 21, 1941. Application filed in Germany Feb. 21, 1940. Brussels, 303,460.*

Cl. E

The necessary heat is produced in stacks filled with coke and by means of the combustion of a solid fuel other than the coke in the stacks, and the stream of hot gas thus obtained is added to the principal current of gas passing through the stacks.

Belgium 442,455

## PROCESS FOR THE PRODUCTION OF MIXED GASES, PARTICULARLY WATER GAS, BY A STREAM OF GAS IN CIRCUIT

Bergfeld, K., Berlin-Halensee, Germany. Represented by P. Desquin, Brussels, Belgium

*Aug. 13, 1941. Application filed in Germany Apr. 8, 1942. Brussels, 304,748.*

Cl. E

A stream of gas and/or of water vapors is heated by internal combustion with the aid of making gas or an analogous gas and it is then passed through a gas producer in order to transform the fuels contained therein into gas.

Belgium 445,339

## PROCESS FOR EXTRACTING CARBURETING GAS FOR ENGINES

Gesellschaft für Linde's Eismaschinen A.G., Höllriegelkreuz bei Munich, Germany. Represented by J. Bède, Brussels, Belgium

*Apr. 25, 1942. Application filed in Germany Apr. 3, 1941. Brussels, 306,878.*

The fractions to be separated from the crude gas are collected in a liquid state by cooling at low temperature and under pressure, by making use of the evapora-

tion of the condensation product and of the expansion of the residual gas and of the liquified part. After collection [of the fraction], in particular of the hydrogen, of the nitrogen, and of the methane, the division of the hydrocarbons into separate fractions is continued.

Belgium 447,237

## PROCESS FOR THE PREPARATION OF A GASEOUS MIXTURE SUITABLE FOR THE SYNTHESIS OF AMMONIA

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany. Represented by E. La-guesse-Hamal, Liège, Belgium

*Sept. 21, 1942. Application filed in Germany Mar. 13, 1942. Liège, 31,023.*

Cl. E

A mixture (100 cubic meters) of hydrocarbons (for example, 42 percent  $\text{CH}_4$ ) and air, possibly enriched with oxygen (for example, 58-40 percent  $\text{O}_2$ ), is conducted under pressure (12 atm.) into an explosion chamber where explosion is induced by electric firing. The explosion gases are separated from the lampblack formed, then passed at high temperature ( $450^\circ$ ), after addition of water vapor, over a ferric oxide catalyzer. The conversion of the carbon monoxide with the water is done at ordinary [atmospheric] pressure. Finally, the gases are freed from  $\text{CO}_2$  by washing with water under pressure (30 atm.). There remains a mixture of 25 percent  $\text{N}_2$  and 75 percent  $\text{H}_2$  suitable for synthesis.

Belgium 451,203

## PROCESS AND INSTALLATION FOR THE CARBONIZATION OF THE WASTE PRODUCTS OF SOLID FUELS

Tinant, J., Liège, Belgium. Represented by M. Bockstael, Antwerp, Belgium

*June 23, 1943. Antwerp, 33,527.*

Cl. E

The material is moved in compact and continuous masses between two surfaces close to each other, one of which is mobile and includes a propulsion device so that compactness and continuity may be uninterrupted during carbonization. An annular oven contains a stationary outer cylindrical wall and an interior wall formed by a rotating drum surrounded by a helicoidal element capable of moving the material in a continuous manner. The drum is provided with oblong-shaped orifices for the passage of the gases and vapors into the interior of the drum and into the evacuation duct, which is also equipped with a helicoidal element, which drives the material from a hopper toward the annular carbonization chamber. Since the latter has a very limited cross section, but has a broad contact surface, it accelerates carbonization and liberation of the vapors and the gases.

Belgium 460,968

## CONTROL APPARATUS FOR INSTALLATIONS FOR THE MANUFACTURE OF GAS

Burns, W. L., and Gibson, J. W., Durie Foundry, Leven, Fife, Scotland. Represented by J. Gevers et Co., Brussels, Belgium

*Oct. 27, 1946. Application filed in Great Britain June 20, 1944. Brussels, 318,906.*

Cl. E

Means influenced by the temperature of gas or gases at one or more determined points of the cycle, regulate the operation of the valves controlling the operations of the installation. [This control apparatus is] applicable to the manufacture of water gas.

Belgium 460,969

**SYSTEM OF ELECTRIC CONTROL FOR THE CONTROL OF THE OPERATING OF VALVES ON INSTALLATIONS FOR THE PRODUCTION OF WATER GAS**

Burns, W. L., and Gibson, J. W., Durie Foundry, Leven, Fife, Scotland. Represented by J. Gevers et Cie., Brussels, Belgium

*Oct. 27, 1945. Application filed in Great Britain on Sept. 5, 1944. Brussels, 318,907.**Cl. E*

An apparatus for hourly regulation controls electro-hydraulically impelled apparatus which is connected to a device that controls the valves.

Belgium 461,996

**COMPLETE GASIFICATION INSTALLATION**

Burns, W. L., and Gibson, J. W., Durie Foundry, Leven, Fife, Scotland. Represented by J. Gevers &amp; Co., Brussels, Belgium

*Dec. 24, 1945. Application filed in Great Britain Aug. 3, 1945. Brussels, 319,772.**Cl. E*

[This process is] for the production of water gas. The retort is surrounded by an annular flue which is in communication with the lower region of the gasification zone above the fuel bed, the said flue serving in turn for the passage of the ascending stream of gases exhausted, and for the passage of the descending stream of water vapor, charged with an enriching agent, toward the gasification zone.

Belgium 462,104

**PROCESS FOR THE MANUFACTURE OF FLUID FUEL**

Standard Oil Development Co., Linden, N.J., U.S.A. Represented by J. Gevers &amp; Co., Brussels, Belgium

*Dec. 29, 1945. Application filed in the U.S.A. on June 18, 1943, in the name of E. M. Hawkins. Brussels, 319,869.**Cl. E*

The heat originating from the combustion of a part of the materials carbureted in a dense fluidified suspension is used for carbonization, and the coked residue is converted into a gas (CO and H<sub>2</sub>) with the aid of air and water vapor.

Belgium 462,362

**PROCESS AND EQUIPMENT FOR THE TREATMENT OF HYDROCARBONACEOUS MATERIALS AND HYDROCARBONS**

The Babcock &amp; Wilcox Co., New York, N.Y., U.S.A. Represented by J. Bède, Brussels, Belgium

*Jan. 14, 1946. Application filed in the U.S.A. Mar. 23, 1944, in the name of E. G. Bailely. Brussels 320,097.**Cl. E*

Hydrocarbons or hydrocarbonaceous materials are subjected to thermic decomposition or to pyrolysis, during which certain components are gasified in a continuous manner under conditions such as to assure maximum value to the products obtained, condensed or not, which, after subsequent treatment, are used as carburants, aromatic hydrocarbons, etc. The drawing [in the original patent] represents the retort which serves to carry out the process.

Belgium 463,234

**PROCESS FOR THE PRODUCTION OF HYDROGEN**

Hercules Powder Co., Wilmington, Del., U.S.A. Represented by H. and C. Plucker, Brussels, Belgium

*Feb. 20, 1946. Application filed in the U.S.A. Feb. 6, 1945, in the name of J. H. Shapleigh. Brussels, 320,833.**Cl. E*

A gaseous mixture of steam and of a petroliferous

hydrocarbon normally liquid is put in contact with a nickel catalyzer at high temperature. The gaseous product obtained contains hydrogen and oxides of carbon and substantially no other carbon containing materials.

Belgium 467,740

**CATALYZER FOR THE PRODUCTION OF SYNTHESIS GAS**

Standard Oil Development Co., Linden, N.J., U.S.A. Represented by J. Gevers &amp; Co., Brussels, Belgium

*Sept. 4, 1946. Application filed in the U.S.A. on Sept. 7, 1945, in the name of B. G. Gillespie. Brussels, 324,534.**Cl. E*

Methane mixed with CO<sub>2</sub> is put in contact with a catalyzer (copper and active carbon) at high temperatures during a period sufficient to effect the conversion of the reaction products into CO and H<sub>2</sub>. The crude products containing paraffinic fuels are recovered.

Belgium 470,025

**PROCESS AND EQUIPMENT FOR THE PRODUCTION, BY THE USE OF COALS CONTAINING VOLATILE MATERIALS, OF GASES WHICH CAN BE USED FOR CHEMICAL SYNTHESSES**

Forni ed Impianti Industriali Ingg. de Bartolomeis, Milan, Italy. Represented by F. Michaux, Brussels, Belgium

*Dec. 20, 1946. Application filed in Italy June 10, 1943. Brussels, 326,388.**Cl. E*

Gasification is effected in a chamber by the injection of steam and oxygen through the mass of incandescent fuel; next, the gases obtained are sent through a bed of incandescent coal contained in a second chamber, in which pyrogenation and hydrogenation of the tar and the hydrocarbons takes place.

Belgium 470,238

**PROCESS FOR MANUFACTURING HYDROGEN AND WATER GAS**

Grasso, D. J. B., 30 Molenweg, Hofstade

*Dec. 31, 1946. Brussels, 326,571.**Cl. E*

The water gas, with steam added if necessary, is sent into quicklime cooled by elements in the lime, vaporizing the water or any other liquid, or otherwise cooled.

Belgium 470,292

**GASIFICATION OF COAL**

Standard Oil Development Co., Elizabeth, N.J., U.S.A. Represented by J. Gevers et Cie., Brussels, Belgium

*Jan. 3, 1947. Application filed in the U.S.A. on Apr. 18, 1946, in the names of H. G. M. Fischer and A. B. Welty Jr.**Brussels, 326,637.**Cl. E*

The temperature in the reaction zone is maintained by the withdrawal of a part of the carbureted substance out of the generator and the passage of this substance into a transfer pipe which is in contact with air for a relatively short time.

Belgium 470,904

**APPARATUS FOR THE DISTILLATION OF SOLID CARBONACEOUS MATERIALS**

Low Temperature Carbonisation, Ltd., London, England. Represented by J. Gevers et Cie., Brussels, Belgium

*Feb. 1, 1947. Brussels, 327,130**Cl. E*

Distillation is effected in retorts suspended transversally in a heating chamber. The retorts include lateral outlets by means of which the vapors and gases liber-

ated pass into a hydraulic collector arranged in the direction of the movement of the retorts through the heating chamber.

Belgium 478,320

PROCESS FOR THE MANUFACTURE OF A SYNTHESIS GAS  
Texaco Development Corp., Wilmington, Del., U.S.A. Represented by G. Vander Haeghen, Brussels, Belgium

Dec. 18, 1947. Application filed in the U.S.A. Dec. 19, 1946, in the names of E. Eastman and L. P. Gaucher. Brussels, 332,682.

Cl. E

A carbonaceous material and oxygen are introduced into a reaction zone in which they react exothermically, and the reaction of these products is permitted to proceed following an endothermic reaction in a space surrounding the exothermic reaction zone in order to use the heat released by the latter.

Belgium 479,136

PROCESS AND APPARATUS FOR GASIFICATION

Koller, K., and Esztergaly, F., Budapest, Hungary. Represented by J. Bède, Brussels, Belgium

Dec. 31, 1947. Application filed in Hungary Oct. 26, 1942. Brussels, 333,434.

Cl. E

The carboniferous materials or the carburants, and the oily deposits, are electrically gasified in a continuous operation by means of a gaseous agent containing combined oxygen. This gasification occurring within an electromagnetic field in such fashion that the necessary quantity of heat is indirectly supplied by electrical induction energy.

Belgium 499,130

OVEN FOR DISTILLING AND GASIFYING FUELS RICH IN ASH

Otto-Simon-Carves N.V., The Hague, Netherlands. Represented by G. Vander Haeghen, Brussels, Belgium

Nov. 30, 1950; application filed Nov. 3, 1950.

Cl. E

The invention consists of an oven for degassing and gasification of fuels rich in ash with vertical chambers operating continuously, having a rectangular cross section, in which chambers the blowing agent flows through the fuel from one wide wall to another, characterized by the fact that the ratio of the height of the fuel to which the blowing agent is admitted at the thickness of the fuel bed is greater than 10:1.

Belgium 501,930

PROCESS FOR THE PRODUCTION OF FUEL GASES STARTING WITH LIQUID FUELS

Heinrich Koppers G.m.b.H., Essen, Germany. Represented by M. Bockstael

Mar. 31, 1951; application filed Mar. 15, 1951. Applications filed in Germany Mar. 15, Aug. 31, 1950, and Feb. 27, 1951.

Cl. E.

The invention consists of a process for the production of high quality fuel gases containing hydrogen and carbon monoxide, through the conversion of hydrocarbons with the aid of oxygen and steam (reactants), using a system of regeneration by reversal of circulation and including at least two regenerators (accumulators of heat supplied by preheating) for the alternate preheating of the reactants, characterized by the fact that additional heat to effect complete conversion is supplied to the hot mixture of the hydrocarbons and the preheated reagents.

Belgium 502,804

PROCESS AND DEVICE FOR COKING LIQUID BITUMINOUS MATERIALS AT A HIGH TEMPERATURE

Rütgerswerke A.G., Frankfurt am Main, Germany. Represented by H. and C. Plucker, Brussels, Belgium

May 15, 1951; application filed Apr. 25, 1951. Application filed in Germany May 8, 1950

Cl. E

The invention consists of a process for coking liquid bituminous materials at a high temperature, for example, lignite pitches or coal tars, petroleum residues, or other analogous materials, characterized by the fact that the material, which may be preheated, is freed of its volatile components, at a temperature higher than its melting point, through distillation, oxidation, polymerization, or by another analogous process, until it attains a viscous state, and is then brought to a solid state by the action of higher temperatures.

Belgium 503,223

IMPROVEMENTS RELATING TO THE CONVERSION OF LIQUID FUELS INTO FIXED GASES

C. B. Francis, Pittsburgh, Pa., U.S.A. Represented by J. Gevers & Cie, Brussels, Belgium

May 31, 1951; application filed May 12, 1951. Application filed in the U.S.A. May 12, 1950.

Cl. E

The invention consists of a method for converting a liquid carbureted material, such as hydrocarbureted oils, tars, and the like, into a combustible mixture of fixed gases, by putting the liquid in contact with a heated porous catalyzer of the "X" type (as defined in the original patent) in the presence of a gaseous oxidizing agent, in which the catalyzer occurs in the form of a column, in the mass of which the liquid is introduced in an intermediate zone of the column at the upper extremity of which the mixture of fixed gases is released.

Belgium 503,241

PROCESS FOR THE PRODUCTION OF FUEL GASES

Heinrich Koppers, G.m.b.H., Essen, Germany. Represented by M. Bockstael

May 31, 1951; application filed May 15, 1951. Application filed in Germany May 23, 1950.

Cl. E

The invention consists of a process for the production of gas of value by means of gasification in suspension of finely divided fuels with gaseous agents, either in the form of steam reacting exothermically and endothermically in a reaction chamber at high temperature into which the fuel is blown, characterized by the fact that the fuel is blown in mixed with oxygen and a gaseous agent; or in the form of steam reacting endothermically and the fact that the composition, the temperature, and the speed of flow of the components of the mixture are established in such fashion that the heat necessary at the interior of the reaction chamber for the endothermic reaction is essentially produced by the exothermic reaction between the fuel and the oxygen.

Belgium 503,577

PROCESS AND INSTALLATION FOR THE EXECUTION OF ENDOTHERMIC REACTIONS BETWEEN SOLID AND GASEOUS MATERIALS

Heinrich Koppers G.m.b.H., Essen, Germany. Represented by M. Bockstael

June 15, 1951; application filed May 29, 1951. Application filed in Germany May 30, 1950.

Cl. E

The invention consists of a process for the execution of endothermic reactions between finely divided solid

materials and materials in a state of gas or vapor in a reaction chamber, which is at a high temperature. The finely divided solid material being held in suspension in the gas or the vapor, and the said process being characterized by the fact that the pace of the endothermic reaction is accelerated, in the reaction chamber, by the action of sound waves on the materials reacting mutually in an endothermic fashion.

Belgium 505,407

**PROCESS AND APPARATUS FOR THE MANUFACTURE OF GAS RICH IN HYDROGEN**

United Engineers & Constructors, Inc., Philadelphia, Pa., U.S.A.

*Sept. 15, 1951; application filed Aug. 23, 1951. Application filed in the U.S.A. Aug. 23, 1950, in the name of J. S. Haug.*

*Cl. E*

The invention consists of a cyclical process for the manufacture by the transformation of a hydrocarbon in a gaseous state and steam of a gas rich in hydrogen and in products from the oxidation of carbon, principally carbon monoxide consisting, in one period of the cycle, of burning a fuel in a combustion chamber, of dividing the hot products resulting from the combustion into two streams, of causing these streams to pass simultaneously and in a parallel manner along two separate passages, each of which includes a first heat-storage zone of refractory material, a zone enclosing a transformation catalyzer, and a second heat-storage zone of refractory material for storing heat in the latter and, in another period of the cycle, of causing hydrocarbon in a gaseous state and steam to pass in series along these two passages, in a direction opposite to the direction of this first-mentioned passage of the hydrocarbon and the steam, forming thereby a gas rich in hydrogen and in carbon oxidation products, principally carbon monoxide, and of collecting this gas.

Belgium 508,602

**MANUFACTURE OF GAS BY GASIFICATION OF FINES OF SOLID FUELS**

Ammonia Casale Società Anonima and L. Jequier, Massagno and Basel, Switzerland, respectively

*Feb. 15, 1952; application filed Jan. 21, 1952. Application filed in Switzerland on Jan. 29 and Apr. 19, 1951.*

*Cl. E*

The invention consists of a process for the gasification of fines of solid fuels maintained in suspension at the stage of dense fluidization, characterized by the use of a gasification zone in cone or pyramid shape widening from the bottom toward the top, by the maintenance in that zone of a temperature such that at the commencement of softening of the ashes of the fuel utilized can be attained, and by the use of the sensible heat of the gases emerging from the gasification zone for the reheating of the means of gasification entering into that zone.

Belgium 509,042

**PROCESS AND APPARATUS FOR THE MANUFACTURE OF CARBURETED WATER GAS**

United Engineers and Constructors, Inc., Philadelphia, Pa., U.S.A.

*Feb. 29, 1952; application filed Feb. 7, 1952.*

*Cl. E*

The invention refers to a process of cyclical manufacture of carbureted water gas by blowing air and injecting water vapor, consisting, during the period corresponding to the heating cycle, of blowing air onto a lighted bed of solid fuel so as to raise the temperature of the latter and to store heat there, of burning the resulting producer gas with secondary air and of

storing its heat by channeling the hot combustion products along a passageway for storing heat in contact with refractory material for storing heat situated within this passageway and, during the period corresponding to the cycle for producing carbureted water gas, of utilizing a part of the heat stored during blowing for the endothermic reaction of the water vapor with the fuel bed so as to produce blue water gas, and of simultaneously using another part of the heat thus accumulated for the gasification of heavy petroleum oil in the presence of water vapor and this blue water gas, characterized by the fact that this heavy petroleum oil is preheated before its gasification by subjecting, during the period corresponding to the air-blowing cycle, a relatively undisturbed charge of this oil, held in metal tubes within a preheating zone, to the indirect transmission of heat departing from these hot combustion products channeled across this preheating zone, and [by the fact that] during the period corresponding to the vapor-injection cycle, oil is made to flow in, raised by preheating to a temperature above approximately 315° C. and under sufficiently high pressure to keep such oil in a substantially liquid phase at that preheating temperature, starting from that preheating zone to the oil-gasification zone of the system for manufacturing carbureted water gas, at the same time resupplying the said preheating zone with oil to be subjected there to preheating during the subsequent blowing period, and the pressure on the said oil is reduced between the said preheating zone and the said oil-gasification zone in order to cause instantaneous vaporization of a considerable proportion of the preheated oil . . . in the said oil-gasification zone by virtue of the heat stored there, through preheating with the depositing of nonvaporized material on the upper portion of the fuel bed, the volume of oil subjected to preheating in the system, at any given moment, at a temperature above approximately 315° C., not exceeding the volume of such preheated oil used during three successive cycles of this process.

Belgium 509,315

**IMPROVEMENTS IN GAS GENERATORS WITH FORMATION OF DRY LIME**

L'Air Liquide Société Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

*Mar. 15, 1952. Application filed Feb. 18 (date blurred), 1952. Application filed in France Feb. 20, 1951, in the name of La Soudure Autogène Française.*

*Cl. E*

The invention consists of a gas generator, for example, an acetylene gas generator, with formation of dry lime and purifying of the gas formed by washing with water, characterized by the fact that the outlet pipe of the gaseous mixture is provided immediately at its outlet from the generator chamber with devices for introducing the washing water.

Belgium 511,123

**IMPROVEMENTS IN THE PROCESSES FOR MANUFACTURING HYDROGEN BY MEANS OF CATALYTIC REDUCTION OF THE WATER VAPOR THROUGH HYDROCARBONS**

Société Chimique de la Grande Paroisse (Azote et Produits Chimiques), Paris, France

*May 31, 1952. Application filed May 2, 1952. Patent application filed in France May 4, 1951.*

*Cl. E*

The invention consists of a process and a device for preparing hydrogen through oxidation of the hydrocarbons by means of water vapor, alone or associated with gases which may contain carbonic acid and oxygen, consisting of introducing progressively, at a series of successive points, the primary mixture con-



taining the hydrocarbon preheated to a temperature which shall at most equal the thermic pyrolysis threshold, into the secondary fluid raised to such temperature that, after mixture, the whole shall have a temperature higher than the threshold of the reaction of the carbon on the water vapor.

Belgium 512,251

**PROCESS FOR THE PRODUCTION OF COMBUSTIBLE GASES**

Heinrich Koppers, G.m.b.H., Essen, Germany

July 15, 1952. Application filed June 20, 1952. Application filed in Germany July 13, 1951.

Cl. E

The invention consists of a process for the production of combustible gases by transformation of finely divided fuels and, in particular, of solid fuels in suspension in oxygen and of endothermically reactive gasification agents, such as water vapor or carbon dioxide, whereby a preformed mixture of the fuel and of the gasifying agents serving as a carrier gas is blown into a reaction chamber maintained at a high temperature, this process being characterized by the fact that the bodies in reaction are directed, across the reaction chamber, first of all in a rectilinear stream and remaining parallel thereto, the stream of the said bodies being then laterally deviated before the endothermic reaction shall have been completed.

Belgium 516,269

**IMPROVEMENTS IN THE PROCESS FOR PRODUCTION OF GAS CONTAINING HYDROGEN BY CONVERSION OF HYDROCARBON AND EQUIPMENT FOR PUTTING THIS PROCESS INTO OPERATION**

Office National Industriel de l'Azote, Toulouse, France

Dec. 31, 1952. Application filed Dec. 15, 1952. Application filed in France Feb. 19, 1952.

Cl. E

The invention consists of a cyclical and catalytic process for producing gas containing hydrogen by converting liquid or gaseous hydrocarbons by means of water vapor, characterized by the fact that each successive cycle is made up of a conversion phase and a heating phase, separated by steam washings.

Belgium 516,699

**PROCESS FOR THE ENRICHMENT OF GENERATOR GAS**

Heurtey & Cie., Paris, France

Jan. 31, 1953. Application filed Jan. 2, 1953. Application filed in France Jan. 8, 1952.

Cl. E

The invention consists of a process for enriching water gas, according to which process a reintroduction is effected into the gasification apparatus of the oily products which originate from the purification of the gas itself, from the carbureted water gas, or from the carbureted whole gas.

Belgium 516,765

**PROCESS FOR THE PRODUCTION OF HYDROGEN OR HYDROGEN GAS**

Lurgi Gesellschaft für Warmetechnik m.b.H. and Gesellschaft für Linde's Eismaschinen A. G., Frankfurt am Main and Hollriegelskreuth bei Munich, Germany, respectively

Jan. 31, 1953; application filed Jan. 6, 1953. Application filed in Germany on Jan. 7, 1952.

Cl. E

The invention consists of a process for manufacturing hydrogen or hydrogen gases, particularly gas containing nitrogen and hydrogen, suitable for the synthesis of ammonia, for example, starting with gas originating from the distillation of fuels, from gasification, or from

similar gases, in which, in addition to hydrogen, large quantities of methane are found, characterized by the fact that, preferably after first separating the constituents with a high boiling point, such as naphthalene, the sulphur-base combinations with a high boiling point, the tar oils, the benzol, and the water if need be, after possible elimination of the hydrogen sulphide and, if need be, after compression, to the extent that the gases are not under pressure, as well as after possible conversion, the gases are cooled to temperatures below 0° C., going for example from -10° to -80° C., preferably with the addition of an organic or inorganic polarising liquid or solution, and are then washed, in one or several phases, at those temperatures or at even lower temperatures, with fluids, particularly organic fluids, preferably polarising fluids, containing water if need be, and are next subjected to decomposition by cooling at low temperatures in the ranges of -140° to -190° C., after which the carbonic oxide (CO) is eliminated from the gas in the last phase of the decomposition by washing with liquid nitrogen.

Belgium 517,196

**PROCESS FOR OBTAINING VALUABLE FUEL GAS STARTING WITH CAKING BITUMINOUS FUELS**

Thyssensche Gas- und Wasserwerke G.m.b.H., Duisburg-Hamborn, Germany

Feb. 14, 1953; application filed Jan. 27, 1953. Applications filed in Germany on Jan. 29 and Feb. 23, 1942 (two applications), and Nov. 5 and Dec. 3, 1952 (two applications).

Cl. E

The invention consists of a process for producing valuable gas starting with finely divided caking coal and from fine ore, with the obtaining of metals or metallic alloys, in which, first, a mixture of coal and fine ore is first coked, thereby forming fuel gas and next gasifying the coke formed, characterized by the fact that starting with the metalliferous coke produced by coking the mixture of coal and fine ore, fuel gases are produced in a low shaft furnace in the form of a gas generator with a draw hole, by gasification with the aid of oxygen and if need be with endothermically reactive gasification agents, and by reducing the ore contained in the coke and liquefying the metal and the ashes, the metal formed and the slag being extracted by themselves in a liquid state from the shaft furnace, in a continuous or in an intermittent manner.

Belgium 517,525

**PROCESS AND APPARATUS FOR GASIFICATION OF PULVERIZED COAL**

The Babcock & Wilcox Co., New York, N.Y., U.S.A.

Feb. 28, 1953. Application filed Feb. 9, 1953.

Cl. E

The invention consists of a process for the continuous production of synthesis gas by the reaction at high temperature of oxygen and water vapor on a solid fuel containing carbon, characterized by the fact that this oxygen, this water vapor, and this fuel are made to react following a distinctly exothermic reaction at the extremity or in the neighborhood of the extremity of an approximately closed primary zone arranged in a reaction chamber in such a way as to raise the temperature of the constituents of the reaction sufficiently to permit an endothermic reaction of the water vapor on the products of this exothermic reaction, and to determine the distinctly endothermic reaction producing the synthesis gas while the constituents of the reaction are crossing a secondary approximately closed zone receiving the said constituents and proceeding from the considered extremity of the primary zone.

Belgium 519,600

## INSTALLATION FOR THE GASIFICATION OF FINELY DIVIDED SOLID FUELS

Heinrich Koppers G.m.b.H., Essen, Germany

May 15, 1953. Application filed Apr. 30, 1953. Applications filed in Germany May 10, 1952 and Apr. 13, 1953.  
Cl. E

The invention consists of an installation for the gasification of finely divided fuels in suspension with oxygen and, if need be, with endothermically reacting gasification agents, in which at least a partial utilization is produced of the sensible heat of the useful gas produced for the production of steam, this installation being characterized by the fact that the chamber in which the reaction of the fuel with the gasification agents is effected (chamber I), and the chamber in which the indirect exchange of heat is effected between the hot gases produced and the water which gives rise to the production of steam (chamber II), constitute a constructive unit, so that the useful gases produced make their way from the gasification chamber (I) directly into the steam-producing chamber (II), without having to undergo the intermediate treatment which is perforce connected with a drop in the temperature.

Belgium 520,591

## PRODUCTION OF OIL GAS ACCORDING TO AN ASH CIRCULATION PROCESS

Union Rheinische Braunkohlen Kraftstoff A.G., Wesseling, Germany

June 30, 1953. Application filed June 10, 1953. Application filed in Germany June 19, 1952.  
Cl. E

The present invention consists of:

A process permitting of gasifying fuels and their own ashes by fusion conducted over a circuit, a separation of the gasification and reheating processes being assured by regulating the introduction, into the circuit of the ashes, of the fuel and of exothermically and endothermically reactive gasification agents; a process characterized by the fact that the gases formed in the endothermic gasification chamber are enriched with hydrocarbons, with the purpose of production of gas of high calorific value, and poor in nitrogen having, for example, the quality of town gas or pipeline gas or of gas with the highest possible percentage of non-saturated hydrocarbons.

Belgium 521,252

## PROCESS FOR THE PRODUCTION OF HYDROGEN AND CARBON MONOXIDE DERIVED WITH LIQUID FUELS (HEAVY MINERAL OILS)

G. Fauser, Milan, Italy

July 31, 1953; application filed July 6, 1953. Application filed in Italy July 11, 1952, in the name of Montecatini Società Generale per l'Industria e Chimico.  
Cl. E

The invention consists of a process for the production of synthesis gas (hydrogen and carbon monoxide) starting with dense liquid fuels (heavy mineral oils) by means of atomization and catalytic reaction with steam and oxygen, characterized by the fact that the catalyst is added to the oil before mixture by atomization with the steam, the temperature of the reaction between the oils and the steam being produced by the heat developed by the reaction between the oils and a regulated quantity of oxygen in mixture with the said steam.

Belgium 522,082

## PROCESS FOR LOW TEMPERATURE DISTILLATION OR DEGASIFICATION OF COAL

Inventor: K. Schaff

Applicant: Steinkohlen-Elektrizität A.G., Essen, Germany  
Aug. 31, 1953; application filed Aug. 11, 1953. Principal patent 513,538 of Aug. 14, 1952; improvement patent applied for in Germany, Aug. 14, 1952.  
Cl. E

The invention concerns the gradual distillation and degasification of coal in a steam boiler characterized by the fact that the nest or nests of boiler tubes used for distillation or degasification are placed in a boiler chamber (precombustion chamber) separately heated, the burned gases of which are mixed with the gas from fumes of the boiler in a suitable place; and by the fact that, to the extent required, the walls of the precombustion chamber are cooled by the nest of tubes of the boiler.

Belgium 522,459

## INSTALLATION FOR THE PRODUCTION OF HYDROGEN GAS

Sabem, S.A. Société Holding, Freiburg, Switzerland

Sept. 15, 1953; application filed Aug. 29, 1953. Patent applied for in Switzerland Sept. 4, 1952, in the name of E. Michiels.  
Cl. E

The invention consists of the production of hydrogen gas intended especially to serve as fuel for activating an engine, characterized by the fact that it includes a first chamber inside which a vaporizer vaporizes water, a second chamber supplied with an offtake pipe and containing a reductive substance, a conduit connecting the two aforementioned chambers, and a heat source intended to furnish the necessary heat, on the one hand to the first chamber in order to perform there the operation of drying the water vapor before the latter shall have gone beyond the said pipe leading it to the second chamber; and, on the other hand, to the second chamber in order to lead the said reductive substance to that chamber at a temperature such that the oxygen of the water vapor led into that chamber by the said conduit shall adhere to the said substance and shall permit the hydrogen to escape by the said offtake pipe.

Belgium 522,834

## PROCESS OF PREPARATION OF GASEOUS MIXTURES CONTAINING PRINCIPALLY HYDROGEN AND CARBON MONOXIDE

Oesterreichische Stickstoffwerke A.G., Linz, Austria

Oct. 15, 1953; application filed Sept. 16, 1953. Application filed in Austria Sept. 25, 1952.  
Cl. E

Process for the preparation of gaseous mixtures containing principally hydrogen and carbon monoxide, and possibly nitrogen, by reaction during the course of a first stage of liquid or fusible products of oils or tars, with oxygen or with mixtures of air and oxygen in the event that steam is present, in order to produce a mixture of H<sub>2</sub>, CO, CO<sub>2</sub>, and steam and possibly N<sub>2</sub>, characterized by the fact that a reaction is induced in this hot gaseous mixture obtained from oil and tar products and not containing lampblack, just as it is formed during the course of the first stage and without any notable cooling in the course of a second operational stage following immediately after the first stage, with coke present in a runoff generator at such temperature that evacuation of the coke ash is effected in a liquid state.

Belgium 525,869

**IMPROVEMENTS IN APPARATUS FOR PRODUCTION OF OIL GAS**

Société de Construction d'Appareils pour Gaz à l'Eau &amp; Gaz Industriels, Montrouge, France

*July 20, 1954; application filed Jan. 20, 1954. Principal Patent 525,842 of Jan. 19, 1954. Patent applied for in France Apr. 10, 1953.**Cl. E*

Improvements in apparatus for producing oil gas described in the principal patent, consisting in the adjunction of at least one heat accumulation chamber, filled or not filled with checkerwork, permitting reheating of the reactional fluid or fluids by recovery of the sensible heat of the manufactured gas.

Belgium 528,655

**PROCESS FOR DRY DISTILLATION OF FUELS**

S.A. Vogogas, Zürich, Switzerland

*May 31, 1954; application filed May 6, 1954. Application filed in Germany on May 27, 1953, in the name of J. Bähr.**Cl. E*

Process of dry distillation of fuels consisting, characteristically, of incorporating a prepared pulverized fuel with a layer of fuel advantageously heated between 800° and 1,200° C., and of mixing the cold and hot constituents by the admission of an appropriate quantity of gas or of steam.

Belgium 529,204

**PROCESS FOR UNDERGROUND STORAGE OF GAS UNDER PRESSURE**

S.A. pour l'Achat, la Vente et la Distribution du Gas, Liège, Belgium. Represented by Vander Haeghen

*Nov. 29, 1954; application filed May 28, 1954.**Cl. E*

The invention consists of a process for underground storage of gas under pressure in which, in a gastight geological stratum, an approximately spherical chamber is artificially created, this chamber is filled with a porous mass impregnated with a liquid fluid forced in from outside the said mass at the same time conducting into it the gas under pressure originating from a compression station.

Belgium 529,413

**IMPROVEMENTS ON PROCESSES FOR CARBONIZING BITUMINOUS COALS**

Pittsburgh Consolidation Coal Co., Pittsburgh, Pa., U.S.A. Represented by C. T. Plucker, Brussels, Belgium

*Dec. 6, 1954; application filed June 5, 1954. Applications filed in Great Britain June 8, 1953, and in the U.S.A. May 4, 1954, in the names of R. T. Struck, E. Gorin, W. E. Lough, and N. E. Sylvander.**Cl. E*

The invention consists of a process for carbonizing

bituminous coal and caking coal at a temperature between 425° and 760°, characterized by the fact that the coal is subjected to preoxidation, under nonagglutinating conditions, in the zone of plasticity of the coal until the coal shall have become, in substance, non-agglutinating when it is heated at the above-mentioned carbonization temperature.

Belgium 533,843

**PROCESS AND DEVICE FOR GASIFICATION OF GRANULAR FUELS**

L. &amp; C. Steinmüller G.m.b.H., Gummersbach, Rhineland, Germany. Represented by Vander Haeghen

*Dec. 31, 1954; application filed Dec. 3, 1954. Application filed in Germany Dec. 4, 1953.**Cl. E*

The invention consists of a process for gasification of granular fuel with granularity ranging from dust to pieces, which is fed onto a grate in a thin layer in proportion to its lateral extension, and which is put in undulating movement by means of a gasification agent, characterized by the fact that the fuel is conducted centrally from above and is distributed radially from the inside toward the outside on the grate, while the gasification agent arrives through the interstices of the grate under such pressure that at least a part of the fuel to be gasified is lifted and is gasified while it is in a floating state, the reaction heat being supplied by partial combustion of the fuel itself.

Belgium 534,409

**PROCESS AND INSTALLATION FOR THE PRODUCTION OF FUEL GASES**

Heinrich Koppers G.m.b.H., Essen, Germany. Represented by S.A. Brevoc

*Jan. 15, 1955; application filed Dec. 24, 1954. Application filed in Germany Dec. 24, 1953.**Cl. E*

The invention consists of a process for the production of fuel gases derived from gaseous or liquid hydrocarbons, according to which a mixture of hydrocarbons, oxygen, and, if necessary, of endothermically reactive gasification agents is blown into a reaction chamber which is at a high temperature and is there ignited, preferably by thermic radiation, characterized by the fact that, apart from the mixture of hydrocarbon and oxygen (first mixture), there is also introduced into the reaction chamber a homogeneous mixture (second mixture) of finely divided solid fuel and of excess oxygen (in proportion to total combustion of the fuel), in such fashion that the carbon of the second mixture burns partially or totally thus giving rise to the formation of a white flame, the thermic radiation originating from the flame of the second mixture accelerating the ignition of the first mixture.

# FRENCH PATENTS

France 469,967

**VERY HIGH-TEMPERATURE DISTILLATION RETORT WITH FREE EXPANSION, FORMING A GAS-PRODUCER HOPPER FOR COKING ALL TYPES OF FAT OR BITUMINOUS FUELS BEFOREHAND WITHIN THE GAS PRODUCER**

Henri Mastang and Louis Monnier, France

*June 4, 1914; application filed Mar. 23, 1914 at Lille. Application filed in Belgium on Jan. 10, 1914.*

*Gr. 15, Cl. 3*

The invention consists of a new arrangement of the distillation retort working on a free expansion basis and at a very high temperature on the gas-producer shaft.

This retort, which is open at both ends, is placed at the head of the gas generator. It serves at the same time as a charging hopper and as a fuel reservoir.

The objective . . . is to permit the distillation and coking of all fuels, no matter what their form, lean coal, fat coal, or bituminous, at present impossible to use feasibly in gas producers, so that, without interruption, the said fuels do not arrive in the shafts for gasification until they have been completely transformed to the state of permeable coke and freed of all recoverable byproducts.

France 471,196

**IMPROVED PROCESS AND APPARATUS FOR CHARGING COAL INTO GASIFICATION CHAMBERS**

Lackmann & Meinecke, Germany

*July 3, 1914; application filed in Paris Apr. 21, 1914. Application filed in England on Apr. 21, 1913.*

*Gr. 15, Cl. 3*

The invention consists of a process and apparatus for central charging of retorts or gasification chambers, characterized by the fact that the filling apparatus, which is at the top of the retort, is so shaped and placed at such a height above the region where the charge is in contact with the walls of the retort, that the pieces of coal are automatically separated from the fines while rolling toward the walls of the retort, whereas the fines remain in the center, thereby determining the regular distribution of the charge, in all the horizontal sections, which favors the progress of the gasification and coking, at the same time leaving for the gas produced a large section for passage, thanks to the steepness of the slope from the top of the charge of coke and to the extent of the surfaces of the slope.

France 472,307

**IMPROVEMENTS IN GAS PRODUCERS**

Harry Ford Smith, U.S.A.

*July 31, 1914; application filed in Paris May 16, 1914.*

*Gr. 15, Cl. 1*

The present invention consists of a gas producer characterized:

(1) By a rectangular jacketing with a central flue for the outlet of the gas through the upper part and in the direction of the largest dimension of the gas producer, fuel chambers being laterally arranged on each side of this flue and a grate which, converging toward the bottom and mechanically driven, extends from each side in a direction parallel to the flue.

France 473,149

**APPARATUS FOR THE CONTINUOUS PRODUCTION OF WATER GAS**

Société Française d'Exploitation de Fours Spéciaux à Haute Température, France, and Mr. Antoine Verzier, France

*Sept. 10, 1914; application filed Sept. 8, 1913.*

*Gr. 15, Cl. 3*

The invention consists of an apparatus for the continuous production of water gas including a basin arranged in the very midst of the ashpit of the apparatus serving as a boiler and characterized by the fact that the fuel is arranged above a tank of water heated from below solely by the radiation from the combustion gases, the water in the tank being thus vaporized and transformed into superheated steam which traverses the thick mass of fuel, thereby creating water gas, in the presence of the necessary quantity of automatically superheated air, without any expenditure whatsoever, of the fuel itself, and conducted by a pipe traversing the collector.

France 473,937

**PROCESS AND APPARATUS FOR THE MANUFACTURE OF WATER GAS**

Société pour l'Exploitation des Procédés de Production de Gaz Industriels, France

*Oct. 24, 1914; application filed in Paris June 22, 1914. Application filed in Germany June 26, 1913.*

*Gr. 15, Cl. 3*

The invention concerns a process for the manufacture of water gas characterized by the fact that, in one and the same gas generator, the air traverses in a parallel manner two columns of coal during the blowing period and the steam traverses in series these two columns of coal during the gas manufacturing period; with a change of direction of the circulation of the steam at each manufacturing period, with a view to increasing the production of the gas generator and the quality of gas produced.

France 474,558

**EXHAUST GAS PRODUCER**

Gabriel Martin, France

*Dec. 8, 1914; application filed in Paris July 3, 1914.*

*Gr. 15, Cl. 3*

The subject of this invention is an exhaust gas producer, characterized by the arrangement, at the lower part of the hearth, of a metal coking plate supporting the fuel and serving as a lid for a vaporization tank containing water, to which the plate transmits heat; the upper part of the apparatus including an annular gas inlet surrounding the hopper, and equipped with one or several gas intakes by means of which the suction is produced.

France 475,407

**IMPROVED APPARATUS FOR PRODUCING WATER GAS**

Alfred Coury, France

*Feb. 22, 1915; application filed in Paris July 16, 1914.*

*Gr. 15, Cl. 3*

The invention is characterized by an apparatus which operates on an alternating basis, by a special

shape, and by a special device, the objective of the entire combination being to produce water gas by using all the calories produced, in so far as is possible.

France 475,528

**CONTINUOUS MANUFACTURE OF WATER GAS BY THE USE OF INDUSTRIAL OXYGEN**

Raoul Pierre Pictet, England

Mar. 4, 1915; application filed in Paris July 21, 1914.  
Application filed in England Oct. 27, 1913.

Gr. 15, Cl. 1

The subject of the invention is:

(1) A process for continuous manufacture of water gas, essentially characterized by the fact that the decomposition of steam is effected on coal, in the presence of pure oxygen, this latter gas being intimately mixed with steam, and in a proportion calculated in such fashion that the reaction of the said oxygen on the coal brought to a high temperature, and which yields carbon monoxide, shall supply a quantity of heat exactly equal to the calorific deficit resulting from the decomposition of the water by the coal, which makes it possible to maintain the temperature of the mass of the coal constant, and to effect continuous manufacture of water gas, without loss of either heat or of fuel, in such fashion that the water gas thus obtained (formed only of hydrogen and carbon monoxide) proves to be thermically equivalent to the coal engaged in the reaction.

France 476,095

**PROCESS AND APPARATUS FOR THE PRODUCTION OF A FUEL GAS**

Pierre Mauvernay, France

Apr. 20, 1915; application filed in Paris Apr. 3, 1914.  
Gr. 15, Cl. 3

This invention concerns essentially:

(1) A process for the production of a fuel gas consisting of sending on a mixture of coke and carbonate of lime (or lime) first air blown then water or vapor charged with water and finally steam, under the appropriate conditions, with a view to producing a fuel gas formed essentially of hydrogen, of methane, and of carbon monoxide and having a very low carbonic acid content, and of regenerating the carbonate of lime formed during the reaction.

France 477,279

**IMPROVEMENTS IN ASH-FUSION GAS GENERATORS**

Heinrich Koppers, Germany

July 10, 1915; application filed in Paris July 28, 1914,  
Two applications filed in Germany July 30, 1913, and  
July 3, 1914.

Gr. 15, Cl. 1

The present invention concerns a process for the use of ash-fusion gas generators, in which a part of the hot gases flows with the slag through the holes for slag runoff, to be collected then, preferably in a forehearth; the gas can be led back from the said forehearth into the gas generator and this, if necessary, after combustion, with the object of heating the slag in the forehearth; in this case, the combustion gases are reduced in the gas generator; the circulation movement can be produced by means of blowing or by means of a naturally existing difference of pressure; if the forehearth takes the form of a cone plunging into a liquid, the slag therein can be immediately and completely extinguished and can be easily removed from the receptacle.

France 480,249

**IMPROVEMENTS IN GAS GENERATORS**

Samuel Glover and John West, England

Apr. 11, 1916; application filed in Paris Nov. 16, 1915.  
Gr. 15, Cl. 3

The subject of the invention is a device for the removal and extraction of the ashes in a gas generator, characterized by the combination, with a table forming a coking plate on which an extractor in the form of an arm moves, of a chamber encircling the said extractor and forming an entrance for air for the gas generator, as well as of a receiving device with a hydraulic closure destined to receive the ashes discharged by the extractor.

France 482,305

**IMPROVED GAS GENERATOR SYSTEM**

Vicente Cervera, Spain

Dec. 14, 1916; application filed in Paris July 21, 1916.  
Gr. 15, Cl. 3

The invention concerns an improved gas generator system in which all refractory material is completely eliminated, the said gas generator being characterized by:

(1) The arrangement of the vaporizer and of the hearth, the latter being able to be opened and closed at will, as well as the door which closes the ashpit, which, in addition to the fact that, owing to its oblique arrangement, it serves as an escape valve in the event of excessive production of steam or of gas if it is closed, can also remain open without this causing the apparatus to cease operating perfectly.

France 483,601

**IMPROVEMENTS IN GAS GENERATORS**

Arthur Henry Lynn, England; Lewis Adams Riley, U.S.A.;  
and Niels Edward Rambush, England

Apr. 30, 1917; application filed in Paris Nov. 25, 1916.  
Application filed in England Nov. 2, 1915.  
Gr. 15, Cl. 3

The invention consists of an agitator apparatus for [agitating] the charge of fuel being treated in the gas generators, including an ashpit of a rotating type and a grate (with regular or irregular surfaces for the lifting and lateral movement of the fuel) and in which all or part of the surface air of the grate takes on the form of an incomplete spiral, of a screw, or an analogous shape, in such fashion that the surfaces remount very gradually and terminate in abrupt and very pronounced shoulders, the said shoulders being angularly greatly spaced out, so that they do not exceed four in number.

France 484,075

**GAS GENERATOR WITH TURNING COKING PLATE**

Paul-Victor Parsy, France

June 9, 1917; application filed in Paris Mar. 9, 1916.  
Gr. 15, Cl. 3

The invention concerns a gas generator system with a turning coking plate, characterized essentially by the combination:

(1) Of a coking plate receiving a movement of rotation and including a central opening for the evacuation of residue and slag, the said plate supporting andirons on which the bars of the grate are arranged.

France 484,578

**COUPLING DEVICE FOR GAS GENERATORS**

Soc. J. &amp; O. G. Pierson, France

*July 28, 1917; application filed in Paris Apr. 26, 1916.  
Gr. 15, Cl. 3*

The present invention concerns a coupling device for gas generators of the "bypass" regulating type, including a gas tank characterized by rods terminating in cones which penetrate more or less inside the pipes linking the gas tank to the gas generators, in such fashion as to cause the flow to vary or to limit it following the position occupied by the cone of the gas tank; the gas tank being placed in communication with the open air by means of an orifice which is uncovered when the points of the above-mentioned pipes disengage themselves.

France 484,973

**APPARATUS AND PROCESS FOR THE MANUFACTURE OF A WATER GAS USEABLE AS ILLUMINATING GAS**

Joseph-Émile Haennig and Ernest-Pierre Beha, France

*Sept. 4, 1917; application filed in Paris Mar. 31, 1917.  
Gr. 15, Cl. 3*

The invention concerns an apparatus and process for the manufacture of a water gas useable as illuminating gas, essentially characterized by the following special features:

(1) The continuous production of a water gas composed for the major part of hydrogen, of very low carbon monoxide content. This result being obtained by the combustion of the coal fed by the superheated steam which has been mixed with pure oxygen.

France 486,057

**IMPROVEMENTS IN GAS GENERATORS**

Frederic Thuman, England

*Dec. 11, 1917; application filed in Paris July 5, 1917.  
Application filed in England on Sept. 16, 1916.  
Gr. 15, Cl. 3*

The invention includes:

(1) A gas generator of the type which is equipped with a turning grate in its base, formed of an ash crusher and a nozzle for the distribution of steam and air, in which gas generator water intake and evacuation pipes, carried by the grate and coaxial with the latter at the places where they are coupled to the main arrival and departure conduits, are linked to the water-circulation conduits formed in the grate.

France 486,567

**PROCESS FOR ELIMINATING SLAG IN A LIQUID STATE IN GAS GENERATORS AND ASH-FUSION GENERATORS**

Georges Rivière and Compagnie Générale de Construction de Fours, France

*Jan. 25, 1918; application filed in Paris Jan. 19, 1917.  
Gr. 15, Cl. 3*

The invention consists of processes for the automatic elimination of slag in a liquid state during the course of the gasification of any and all fuel in a gas generator, consisting of creating a zone for the fusion of ashes in which the calorific effects are regulatable and absolutely independent of the fuel in the course of gasification.

France 486,773

**PROCESS AND APPARATUS FOR THE MANUFACTURE OF WATER GAS**

Compagnie pour la Fabrication des Compteurs et Matériel d'Usines à Gaz, France

*Feb. 14, 1918; application filed in Paris Jan. 31, 1917.  
Gr. 15., Cl. 3*

The invention consists of a process for the manufacture of water gas, whereby high and substantially

equal temperature is maintained throughout all the fuel mass, and whereby all excess production of carbon monoxide is avoided during the blowing, a large height of fuel being operated on throughout the process, the fuel being divided, to this end, into two equal superimposed zones through which air is alternately blown.

France 487,132

**IMPROVEMENTS BROUGHT ABOUT IN THE CONSTRUCTION OF GAS GENERATORS**

The International Construction Co., Ltd., England

*Mar. 16, 1918; application filed in Paris Oct. 12, 1917.  
Application filed in England Apr. 12, 1917.  
Gr. 15, Cl. 3*

The blowing apparatus improved for gas generators is characterized by . . . the establishment of devices permitting of regulating directly the surfaces of the blowing openings leading air into the fuel bed in the various zones of the base of the gas generator, without influencing the pressure inside the wind box located at the rear and inside all the said openings, these devices being susceptible of being activated during the operation of the gas generator.

France 487,894

**GAS GENERATOR FOR HEATING**

Paul Beaudequin, France

*May 14, 1918; application filed in Orléans Feb. 13, 1917.  
Gr. 15, Cl. 3*

The present invention consists of a system of a direct combustion gas generator suitable for producing gas destined for heating, characterized by the fact that the coking fuel is introduced under pressure into the gas generator by lateral orifices emptying the upper portion of the fuels introduced in ignition, which the fuel distills, the volatile products mingling themselves directly to the totality of the gases, and the coke cannot agglomerate nor form a dome, and [thus] assures proper feeding of the hearth without chimneys or vents; and further by the fact that the gas generator system is supplied with a rotating basin supporting separate orifices for air and steam in order to assure through their simultaneous passage the fusion of the ashes, their cooling, and their bursting, at the same time assuring the decomposition of the steam.

France 488,223

**GAS GENERATOR WITH AUTOMATIC POKING**

Paul-Victor Parsy, France

*June 10, 1918; application filed in Paris Apr., 11, 1917.  
Gr. 15, Cl. 1*

The present invention consists of . . . a gas-generator system with automatic poking, characterized essentially by the fact that . . . the general arrangement of the gas generator includes, in combination, a fixed coking plate and a moving grate for automatic poking; and by the fact that . . . the coking plate is formed by a basin of cast iron the base of which presents a truncated conical part open at its top for the passage of air under pressure, this basin being equipped laterally with a or several openings for the evacuation of slag.

France 488,226

**DEVICE FOR GENERATING WATER GAS**

Société d'Exploitation des Appareils Rateau, France

*June 10, 1918; application filed in Paris Jan. 24, 1917.  
Gr. 15, Cl. 3*

The invention concerns a device for generating water gas by alternating the blowing of air and steam, characterized by the fact that the steam engine which activates the blower exhausts into a steam accumulator or other similar apparatus which then gives the steam

to the gas producer during the arresting of the blower, in such fashion as to use for the production of water gas the steam which has served for the air blowing.

France 490,812

**GAS PRODUCER OF THE AUTO-GENERATOR STEAM TYPE FOR THE MANUFACTURE OF WATER GAS**

Louis-Victor Simonet, France

*Jan. 13, 1919; application filed in Grenoble on June 20, 1918.  
Gr. 15, Cl. 3*

The present invention consists of a device making it possible to recover in a water-gas generator the heat put into play in the said gas generator, for the manufacture of the gas, the consequence of which device is the elimination of independent boilers for the manufacture of water gas.

France 491,677

**GAS PRODUCER**

Louis Fornas, France

*Feb. 12, 1919; application filed in Paris Feb. 13, 1918.  
Gr. 15, Cl. 3*

The invention consists of a single or multiple gas producer composed principally of loaders arranged above a smoke chamber; of dryers arranged below [the] loaders and in a chamber for the arrival of air forming a circular and recovering current; of hearths arranged below [the] dryers in a chamber for the circulation of gas and deposit of ashes; and finally, below the grate, an ashpit, with its door.

France 491,712

**GAS GENERATOR**

Chapman Engineering Co., U.S.A.

*Feb. 13, 1919; application filed in Paris Sept. 11, 1918.  
Application filed in the U.S.A. on Apr. 20, 1918.  
Gr. 15, Cl. 3*

The invention concerns a gas generator characterized by the fact that . . . a relative movement of rotation is produced between the device for supporting the fuel bed and an agitator extending inside the latter and capable of coming close to and moving away from the said fuel bed; and [by] a device which makes it possible to determine the elevation of the agitator by the resistance set up in opposition to this relative movement by the engagement of the agitator with the fuel.

France 492,450

**IMPROVEMENTS IN GAS PRODUCERS**

Samuel B. Sheldon, U.S.A.

*Mar. 19, 1919; application filed in Paris Oct. 23, 1918.  
Gr. 15, Cl. 3*

The invention concerns improvements in gas producers, and is characterized particularly by the following points:

(a) The gas producer includes a beam mounted in such fashion that it can turn and on which are mounted pokers intended to act on the entire fuel bed during a single turn of the beam.

(b) The feed hopper is combined with several pushing devices activated in such fashion as to deliver fuel to a device which distributes it to the inside of the gas producer, and the pushing devices and the distributor being activated by a common device.

France 494,456

**IMPROVEMENTS IN GAS PRODUCERS**

Victor-Léon Cazes, France

*May 31, 1919; application filed in Paris Jan. 3, 1919.  
Gr. 15, Cl. 3*

This invention concerns a gas producer which yields a gas which is not saturated with water and rich in

hydrogen, this gas producer being characterized essentially by the fact that it includes at an appropriate height a circular exhaust-type collector, the gas exhausted being not charged with water, since it does not traverse the higher beds of coal, and the gas not exhausted and charged with water redescends to the ashpit in order to reascend through incandescent beds, resulting in disassociation of hydrogen.

France 494,966

**DEVICE FOR AUTOMATIC POKING FOR GAS PRODUCERS**

Jean Moussiaux, Belgium

*June 13, 1919; application filed in Paris Jan. 21, 1919.  
Application filed in Belgium Dec. 7, 1916.  
Gr. 15, Cl. 3*

The present invention concerns a device for automatic poking for gas producers including a turning coking plate supporting a bed of ashes, presenting the following characteristics:

(1) Descent chutes project from the coking plate and are constantly filled with ashes; the base of these chutes is closed and the cinders emerge by one or several openings arranged in the walls of the chute at the lower part.

France 496,053

**IMPROVEMENTS IN GAS PRODUCERS**

John Stewart, England

*July 21, 1919; application filed in Paris Feb. 22, 1919.  
Gr. 15, Cl. 3*

This invention concerns improvements brought about in a gas producers and characterized by the fact that . . . A vertical chamber always operating by upward draft is combined by one or several inclined chambers following a certain angle and operating always by downward draft, the said vertical chamber being fed hot fuel coming from other chambers.

France 497,808

**ROTATING GRATE FOR GAS PRODUCER**

Joseph Lambot, Belgium

*Sept. 25, 1919; application filed in Paris Apr. 3, 1919.  
Gr. 15, Cl. 3*

The invention consists of a rotating grate with automatic poking which is continuous and characterized by the fact that . . . the shape of the upper part of this grate presents an undulated dentiform surface with a gentle slope of the anterior side, following the direction of its rotation, in order to produce local and periodic liftings of the fuel, in order to prevent agglomeration of the slag and the formation of blowholes.

France 498,047

**PROCESS FOR PREVENTING IRREGULARITIES OF OPERATION OF GAS PRODUCERS OF THE ASH-FUSION TYPE**

Jules Raizen, Luxembourg

*Oct. 3, 1919; application filed in Paris Apr. 9, 1919.  
Gr. 15, Cl. 3*

The purpose of the invention is a process for preventing irregularities in the operation of gas producers of the ash-fusion type, this process consisting of adding inside the gas producer a metal which, arriving in a molten state at the lower part of the gas producer, brings heat, which prevents the premature cooling and consequent solidification of the slag.

France 499,881

**IMPROVEMENTS IN THE CONSTRUCTION OF GAS PRODUCERS**

Pierre Batigne, France

*Dec. 1, 1919; application filed in Paris May 21, 1919.  
Gr. 15, Cl. 3*

The invention concerns gas producers and brings about improvements the principal purpose of which is

to effect regular and automatic charging with the use of run-of-the-mine coal, and to effect automatic and regular poking.

These improvements are characterized principally by:

(1) A Distributive rotating spout, constituted by a conical base including radial gutters which distribute the fuel to the periphery of the shaft.

France 500,521

**PROCESS AND APPARATUS FOR GASIFICATION WITHOUT PRODUCTION OF SLAG IN THE GAS GENERATOR**

Henri Francart, Belgium

*Dec. 22, 1919; application filed in Paris June 6, 1919. Application filed in England on June 9, 1918.*

*Gr. 15, Cl. 3*

The invention consists of a gasification process according to which the air feeding the gas generator is placed in contact, inside a special chamber called the combustion chamber, with a quantity of gas substantially greater than that which would be necessary to assure perfect combustion, in such fashion that combustion takes place there at a lower temperature than the fusion temperature of the ashes in the gas generator, and that the total gaseous mass thus produced be capable of heating in a regular and uniform manner, throughout its entire cross section and its entire height, the fuel chamber in which regeneration of the gas takes place.

France 500,692

**NEW GAS GENERATOR WITH CENTRAL HEARTH**

Société des Moteurs Gnome et Rhône, France

*Jan. 2, 1920; application filed in Paris, June 13, 1919.*

*Gr. 15, Cl. 3*

The subject of the invention is a gas generator with a central hearth characterized essentially by the very clear separation of the hearth, in which combustion takes place, from the reaction chamber where the carbon which the said chamber contains brings about the transformation upon contact of the gasses produced in the hearth; as well as by the arrangement of the fuel storage [area] in relation to the reaction chamber, in such fashion that all the distillation products of the fuel be reduced to a gaseous state.

France 501,200

**GAS GENERATOR**

Albert L. Galusha, U.S.A.

*Jan. 19, 1920; application filed in Paris June 30, 1919. Two applications filed in the U.S.A. on July 15, 1918, and May 6, 1919.*

*Gr. 15, Cl. 3*

The present invention consists of an apparatus for the preparation of generator gas, characterized by one or several of the following points:

(a) The quantities of air and steam to be distributed to the generator are regulated automatically in proportion to the volume of gas produced by the apparatus;

(b) The gases from the discharge of the internal combustion motor fed by the gas generator determine the volume of steam which is distributed to the generator, the said volume of steam in turn determining the quantity of air distributed to the said generator;

(c) The steam is engendered by water poured into the evacuation duct of the motor, the said steam being turned away from the top of the said duct by a deflector, preferably adjustable;

(d) The use of an adjustable lid to more or less close the mouth of the air admission duct;

(e) The air and steam necessary for the production of the gas are distributed to the generator under pressure approximately equal to that of the atmosphere.

France 501,988

**IMPROVEMENTS IN WATER-GAS GENERATORS**

Herbert Edward Smith, England

*Feb. 9, 1920; application filed in Paris July 26, 1919.*

*Application filed in England Aug. 3, 1918.*

*Gr. 15, Cl. 3.*

The present invention consists of a device, in a water-gas generator of the single or double type, and in the event that the said generator be contained either in a single or in two separate cylinders, and that the gas is manufactured in an intermittent manner with alternating periods of "operating" and "blowing", improved in such fashion that central valves with dry surfaces, appropriately arranged for the blowing direction of the gases and of the blowing gases, are suitably coupled to operate in conjunction with the steam connection.

France 502,253

**PROCESS FOR THE GASIFICATION OF SOLID FUELS SUCH AS COAL, LIGNITE, PEAT, WOOD, WOOD WASTE, AND OTHER ANALOGOUS GASIFIABLE MATERIALS**

Friedrich Godfried Carl Rincker, Netherlands

*Feb. 17, 1920; application filed in Paris Aug. 6, 1919. Application filed in the Netherlands Feb. 24, 1919.*

*Gr. 15, Cl. 3.*

The subject of the invention is a process for the gasification of solid fuels such as coal, lignite, peat, wood, wood waste, and analogous gasifiable materials, characterized by the fact that the said gasification takes place by the action of water gas in a generator whereby . . . the gas produced in one of the generators during the production phase of the gas is used to act on the fuel to be gasified which is in the other generator, in such manner that, on the one hand, the gases characteristic of the fuel to be gasified and their byproducts are freed, and on the other hand, the fuel is transformed into coke which will be used in the following phase according to an inverse operation in order to obtain water gas.

France 502,734

**RETORTS AND APPARATUS FOR MANUFACTURING GAS**

Drakes, Ltd., and Jonas Wilfrid Drake, England

*Feb. 27, 1920; application filed in Paris Jan. 9, 1919. Application filed in England Oct. 4, 1917.*

*Gr. 15, Cl. 3.*

The invention includes an apparatus for the manufacture of gases constructed and arranged in such fashion that, at a given moment, coal gas can be produced continually by the apparatus, while at another moment producer gas alone can be produced in a continuous manner, or else that, when desired, these two gases can be produced in a continuous manner and be mixed together in any desired proportions, inside a coal-gas retort or retorts, in such fashion that, combined in that form, these gases may be continuously delivered, this apparatus being further characterized by the fact that . . . coal gas, producer gas and water gas can be produced separately and continuously, or a mixture of these three gases can be continuously produced, the mixture being made inside the retort in any desired proportions.

France 502,737

**GAS PRODUCER SYSTEM PERMITTING THE USE OF ALL TYPES OF COMBUSTIBLES**

Joseph-Eugène-Marie Briest, France

*Feb. 27, 1920; application filed in Paris Jan. 18, 1919.*

*Gr. 15, Cl. 3.*

The present invention concerns a gas-producer system permitting the use of all types of fuels, even those which distill most easily, such as wood, and including



. . . an arrangement of the hearth presenting a rectangular horizontal section and a diamond-shaped vertical section, the very pronounced incline of the coking plate of the hearth permitting an easy flow of the liquified materials; the introduction of the fuel in the angle of the upper part of the bottom; the exit of the gases in the lower part of the bottom; the air heated by the gases which escape from the hearth being distributed throughout the entire periphery of the coking plate by the appropriate blast orifices.

France 503,072

#### EXHAUST-TYPE GAS GENERATOR

The Efficient Gas Power Co., Ltd., Australia

Mar. 8, 1920; application filed in Paris Aug. 26, 1919.  
(Two applications filed in Australia on Sept. 6, 1918, and May 2, 1919.)

Gr. 15, Cl. 1

The invention includes:

A suction-type gas generator including a refractory-lined generator with a grate hearth, this generator presenting above the said grate hearth a closed gas-collector space, provided with a gas-outlet orifice; a chamber for the generation and superheating of steam surrounding this generator and attached thereto; means for supplying water, or water and air, to this chamber; an ashpit, below the grate, provided with several openings in its walls for communication with the said chamber; means for supplying fuel to this hearth, and means for inducing a current of air, of steam, or of steam and air, into the fuel bed which is inside the hearth, this gas generator likewise characterized by one or several special features.

France 505,428

#### IMPROVEMENTS IN APPARATUS FOR PRODUCING GAS

John Wells, Egypt

May 6, 1920; application filed in Paris Oct. 17, 1919.  
Gr. 15, Cl. 3

The invention concerns a gas producer composed essentially of a double jacketing, the space included between the two jacketings being arranged to receive water for the purposes indicated, and presenting in addition the following special features:

(1) The air is admitted into an inside chamber through air-inlet pipes or blast orifices which are extended through the space filled with water.

France 506,129

#### IMPROVEMENTS IN GAS GENERATORS

Société Anonyme des Anciens Établissements Loy & Aubé  
France

May 21, 1920; application filed in Paris Nov. 15, 1919.  
Gr. 15, Cl. 3

The present invention concerns a gas generator with closed shaft and continuous operation including essentially an air distributor in an annular shape with an outside diameter less than the inside diameter of the shaft and having air-outlet orifices directed toward the interior and toward the exterior in order to distribute the air in the fuel as uniformly as possible.

France 506,278

#### GAS GENERATOR USING THE HEAT FROM THE FORMATION OF CARBON MONOXIDE FOR INDUSTRIAL USES

Alfred-Jean-André Héreng, France

May 26, 1920; application filed in Paris Nov. 22, 1917.  
Gr. 15, Cl. 3

This invention concerns a gas generator constructed in such fashion that it shall be possible to use the calories released by the combustion of coal to form gas. This gas completely retains all its calories for ordinary uses.

France 507,490

#### IMPROVEMENTS IN GAS GENERATORS

Ernest Hope Crush, England

June 24, 1920; application filed in Paris Dec. 16, 1919.  
Application filed in England on Dec. 17, 1918.  
Gr. 15, Cl. 3

The invention includes . . . a gas generator in which the gas intake is arranged at the upper part of the gas chamber, and in which the steam generator includes water pipes which slope or are curved back toward the interior at the upper part, with a view to facilitating the deposit of dust contained in the gas engendered.

France 508,384

#### IMPROVEMENT IN THE CONSTRUCTION OF WATER-GAS GENERATORS, GENERATORS FOR PRODUCER GAS, HYDROCARBONS GAS, AND OTHER ANALOGOUS APPARATUS

Oscar Dacosta, France

July 22, 1920; application filed in Paris Jan. 13, 1920.  
Gr. 15, Cl. 3

The invention concerns . . . an improvement in the construction of generators for producing water gas, producer gas, or other apparatus including a refractory wall or lining housed hitherto inside a sheet-metal casing, characterized by the fact that the said sheet-metal casing is replaced by a reinforced cement casing in a single piece which forms the true body of the apparatus and which, as a result of its own resistance, makes it possible, under the desired conditions of air- and/or water-tightness, to protect and to support the refractory wall housed inside in a much more effective manner than is possible with a single sheet-metal casing.

France 508,836

#### INSTALLATION FOR THE SIMULTANEOUS PRODUCTION OF WATER GAS AND ILLUMINATING GAS

James Lowe, New Zealand

Aug. 4, 1920; application filed in Paris Jan. 22, 1920.  
Application filed in New Zealand Aug. 19, 1919.  
Gr. 15, Cl. 3

The present invention concerns an installation for the production of water gas including two generators arranged in such fashion that the water-gas is formed in one of them while the firebox of the other is fed by air and hence revived, the production of water gas and of producer gas being alternated in such fashion as to assure continuous production of these two gases, this installation being combined with a series of gas retorts in which coal is carbonized and through which the water gas produced in the said installation passes, this water gas being also capable of being introduced into illuminating gas during any one of its manufacturing phases, and the whole being so arranged that the generator gas produced in the water-gas installation shall be consumed in the fire boxes for heating the gas retorts, or in any other fire boxes.

France 509,994

#### IMPROVEMENTS IN GAS GENERATORS

Établissements Poulenc Frères and Jean Gohin, France

Aug. 28, 1920; application filed in Paris June 7, 1919.  
Gr. 15, Cl. 3

The present invention concerns a gas generator without a grate applicable to the distillation of various fuels which do not yield caking ash, characterized by the arrangement at the base of the shaft of a horizontal air-blowing orifice which drives away the gases and the ashes through a wide opening which gives access to the washing and saturation column, from which the gases empty, on the one hand, and from

which, on the other hand, the ashes are pulled away by the washing itself.

France 511,035

**NEW GAS-PRODUCER APPARATUS**

Mora et Bonet, Spain

*Sept. 17, 1920; application filed in Paris Mar. 3, 1920.  
Gr. 15, Cl. 3*

The present invention concerns a new gas-producer apparatus, characterized by the . . . fact that . . . [it includes] a grate for ejecting the ashes, which can be a disc rotating on ball bearings, or on an axis; or a series of moveable sloping plates; . . . the application of an absorbent pipe in the lower part of the apparatus in order to purify the gases of tarry substances by causing them to traverse the incandescent mass in the firebox; . . . orifices arranged in spiral around the firebox create an appropriate current of air destined to maintain live combustion.

France 512,048

**GAS-GENERATOR HEARTH FOR POWDERED COAL**

Anciens Établissements Loy & Aubé, S.A., France

*Oct. 3, 1920; application filed in Paris Mar. 19, 1920.  
Gr. 15, Cl. 1*

The invention concerns . . . a process of heating through powdered fuels consisting of first transforming these fuels into carbon monoxide in a forehearth, then of burning this gas to carbonic acid in the heating enclosure, the primary and secondary air necessary for these successive combustions being reheated by recovery and appropriately introduced in the proper proportions.

France 512,598

**WATER-GAS GENERATOR**

Dellwick-Fleischer Wassergas G.m.b.H., Germany

*Oct. 16, 1920; application filed in Paris Apr. 15, 1916.  
Application filed in Germany Jan. 14, 1915.  
Gr. 15, Cl. 3*

The present invention concerns a water-gas generator, specially intended for small industries, in which the shaft of the gas generator is connected to the scrubber without interposition of mechanical closing devices, characterized by the fact that a safety valve in the form of a pipe entering at a shallow depth into a receptacle which communicates with the water of the scrubber is inserted, behind a single valve, in the hot air exhaust duct connected to the gas-outlet duct.

France 517,332

**IMPROVED PROCESS FOR THE DISTILLATION, CARBONIZATION, OR GASIFICATION, ETC., OF SOLID CARBONIFEROUS MATERIALS**

William Everard Davies, England

*Dec. 17, 1920; application filed in Caen Aug. 20, 1919.  
Application filed in England on May 13, 1919.  
Gr. 15, Cl. 3*

The present invention concerns an improved process for the distillation, carbonization, or gasification of solid carboniferous materials, such as coal, peat, wood, detritus, or other similar organic materials, together with an improved apparatus for carrying out such distillation, etc., operating in an intermittent or continuous fashion.

The characteristic part of the process consists of the introduction of the appropriate gases at various temperatures and mixed or not mixed with the combustion products of the heating flues, in a distillation chamber, through holes in the heating wall, the distribution of the said gases on the surface of the charge being as

regular as is desired, and the said gases passing afterward through the charge and from thence together with the products of distillation or gasification into an extraction chamber through a perforated wall, preferably of the type described in the original patent.

France 512,723

**GENERATOR OF GAS UNDER PRESSURE BY CONTINUOUS COMBUSTION IN A CLOSED VESSEL**

René-Lucien-Joseph Pierrel, France

*Oct. 21, 1920; application filed in Paris Jan. 5, 1920.  
Gr. 15, Cl. 3*

The subject of the invention is the production, by combustion under pressure and in a closed vessel, of a quantity of gas at a relatively low temperature . . . including a blowpipe [which] is fed by any gaseous, liquid, solid, or pulverized fuel, or by any gaseous, liquid, solid or pulverized comburent; it burns under pressure in a boiler. The gases supplied by the combustion are at a variable temperature according to the materials chosen, but in any case too high to be used. These residual combustion gases are cooled by the addition of air or of any other gas, or by an injection of water or steam . . . or any other material susceptible of being gasified under the effect of the existing heat.

France 513,506

**GAS GENERATOR FOR THE PRODUCTION OF BLUE WATER GAS**

Société J. & O.-G. Pierson, France

*Nov. 3, 1920; application filed in Paris Apr. 9, 1920.  
Gr. 15, Cl. 3*

The present invention concerns a gas generator for the production of blue water gas, characterized by a hearth with a jacketing of water forming a boiler, an appropriate set of piping making it possible to blow air under the grate in order to activate the fire until the pressure in the boiler shall have attained a certain limit, blowing ceasing at this point and the steam of the boiler being then sent under the grate in order to produce, while traversing the incandescent fuel, blue water gas, and thus until the pressure having dropped again in the boiler to a certain value, the admission of steam shall have been cut off and blowing shall have begun again, and so on. The functioning of the gas generator can be operated manually or automatically.

France 513,285

**GAS GENERATOR FOR THE PRODUCTION OF PRODUCER GAS OR WATER GAS WITH BITUMINOUS FUELS SUCH AS COAL, LIGNITE, OR OTHER SIMILAR MATERIALS IN MIXTURE WITH THE GASES FROM THE DISTILLATION OF COAL, IN CYCLIC OPERATION**

Eugen Dolensky, Germany

*Oct. 29, 1920; application filed in Paris Sept. 5, 1916.  
Two applications filed: one in Germany July 5, 1915;  
the other in the U.S.A. May 31, 1916.  
Gr. 15, Cl. 1*

The present invention concerns . . . a process for the production of gas in mixture with distillation gases by means of bituminous fuel, characterized by the fact that . . . the blast air intended for heating passes alternately from one side of the gas generator to the other side above a heating fire bridge and at the same time brings the hearth of the gas generator to the desired temperature and promotes the formation of clinkers at the air inlet.

France 514,299

## CLOSURE OF POKING ORIFICE FOR GAS GENERATORS AND SIMILAR APPARATUS, ENCLOSING GASES UNDER PRESSURE

Façoneisen-Walzwerk L. Mannstaedt &amp; Cie., and Hugo Bansen, Germany

Nov. 13, 1920; application filed in Paris Apr. 23, 1920. Application filed in Germany on July 25, 1916.

Gr. 15, Cl. 3

The invention includes . . . a closure of the poking orifice for gas generators, in which gas is prevented from escaping from the open orifice by the current of a gasiform block-off agent running counter to the gas current and brought in by passageways in the closing device; the closure consists of a moveable cap, connected to the reservoir of block-off agent by a flexible duct, in such fashion that a single and only cap suffices for all the poker orifices.

France 515,181

## PROCESS FOR THE PRODUCTION OF CARBURETED WATER GAS

Émile Bastin, Belgium

Nov. 22, 1920; application filed in Paris Apr. 30, 1920. Application filed in Belgium Dec. 1, 1919.

Gr. 15, Cl. 3

The invention consists of a process for the production of carbureted water gas by the introduction into ordinary water-gas generators of petroleum in the form of a fog with a view to obtaining closer contact with the incandescent coke, more perfect heat transmission, and as a result, a more complete dissociation, and hence, more abundant production of gas with less forming of tar.

France 516,819

## IMPROVEMENTS IN GAS GENERATORS

Paul Beaudequin, France

Dec. 10, 1920; application filed in Orléans Oct. 31, 1919.

Gr. 15, Cl. 3

The present invention concerns improvements in gas generators.

The first [improvement] applies particularly to reverse combustion gas generators and the purpose thereof is to exhaust and condense the steam by connecting the upper part of the gas generator to a blower, this blower being cooled by an injection of water.

France 517,733

## DEVICE FOR UNIFORM CHARGING AND DISTRIBUTION OF FUEL IN GAS GENERATORS

Remo de Bartolomeis, Italy

Dec. 21, 1920; application filed in Paris June 24, 1920. Application filed in Italy Apr. 30, 1919.

Gr. 15, Cl. 3

The subject of the invention is a device applicable to gas generators for charging with uniform distribution of the fuel, a device which includes one or several hoppers from which the fuel falls close to the wall of the chamber and one or several rakes mounted below each hopper and endowed with a to-and-fro movement for distributing and equalizing the fuel as it is charged, this device being also characterized by one or several additional points, as follows: (a) Each hopper forms at the bottom a mouth adjacent to one wall of the chamber of the gas generator and occupied by a paddle wheel having approximately the same length as the said wall of the chamber.

France 517,734

## INSTALLATION FOR THE GASIFICATION OF FUELS WITH A HIGH WATER CONTENT

Remo de Bartolomeis, Italy

Dec. 21, 1920; application filed in Paris June 24, 1920. Two applications filed in Italy June 6, 1918, and Apr. 30, 1919.

Gr. 15, Cl. 3

The subject of the invention is an installation for the gasification of producer-fuels with a high water content and characterized by the fact that . . . it includes a gas generator the upper chamber of which is divided, for the passage of the fuel which should be subjected beforehand to drying, into compartments adjacent to a dome housed in the central zone of the chamber and communicates by its lower mouth with the chamber itself, at a determined height above the grates, and on the other hand with the discharge of the gas, in such fashion that it forms a central intake for the gas and causes the latter to heat the fuel charged.

France 519,726

## GAS GENERATOR

James William Parker and Ernest Goldsmid-Abrahams, England

Jan. 28, 1921; application filed in Paris July 8, 1920. Application filed in England Oct. 29, 1918.

Gr. 15, Cl. 3

The invention concerns a gas generator for the production of gas starting with a solid fuel, characterized by the fact that its shaft is composed of metal cylinders which are superimposed, and is surrounded by a metal box in such fashion that between the shaft and the box an annular chamber is formed, intended to conduct under the grate of the gas generator the air needed for the combustion, the lower cylinder, at least, being equipped with blades in such fashion that the annular chamber is divided into a certain number of air ducts.

France 522,315

## WORKING PROCESS FOR GAS GENERATORS AND DEVICES MAKING IT POSSIBLE TO CARRY OUT THIS PROCESS

Ernst Hilger, Germany

Mar. 26, 1921; application filed in Paris Aug. 11, 1920. Application filed in Germany on Aug. 16, 1919.

Gr. 15, Cl. 3

The present invention concerns (1) a working process for gas generators characterized by the fact that gas is uniformly disengaged throughout the entire [cross] section of the gas generator, as a result of rotation which does not permit the drops of slag which form to agglomerate into blocks or balls; (2) a gas generator, characterized by the fact that . . . in addition to the grate, the shaft is likewise rotating.

France 523,201

## IMPROVEMENT IN THE CONSTRUCTION OF TEMPERATURE EXCHANGERS USED IN GAS GENERATOR INSTALLATIONS

Société Franco-Belge de Fours à Coke, S.A., Belgium

Apr. 15, 1921; application filed in Paris Aug. 30, 1920. Application filed in Belgium on Feb. 23, 1920.

Gr. 15, Cl. 3

The invention concerns a temperature exchanger between two fluids, characterized by the fact that . . . it is composed of juxtaposed chambers, the even chambers of which are connected with each other in order to form the circuit of one of the fluids, while the odd chambers are connected with each other in order to form the circuit of the other fluid, the connections being made by means of exterior pipes.

France 523,714

**PROCESS AND APPARATUS FOR THE PRODUCTION OF WATER GAS**

Nicolaas Josephus Martinus Willemsse, Netherlands

*Apr. 27, 1921; application filed in Paris Sept. 7, 1920. Two applications filed in the Netherlands July 29, 1919, and May 12, 1920.*

Gr. 15, Cl. 3.

The present invention concerns . . . a process for the production of water gas in which the fuel, during air blowing, transfers its heat to an envelope of water which surrounds it, the steam thus produced being used for the production of gas in the gas generator.

France 524,111

**IMPROVED GAS GENERATOR DEVICE**

Société Française de Matériel Agricole et Industriel, France

*May 7, 1921; application filed in Paris on Apr. 17, 1916.*

Gr. 15, Cl. 3.

The invention consists of an autoreductive gas generator with completely reversed operation, functioning by means of the combination of several supplementary rows of air arranged at various heights above the grate, characterized by the constitution of the shaft in an oblong shape, with the objective of facilitating the access of supplementary air to the midst of the fuel over the entire surface of the shaft and, as a result, a better utilization of the volume of the shaft and of the outlet surface of the gases, as well as a more perfect transformation of the tars and the hydrocarbon gases; the oblong shape of the shaft being, preferably, combined with the corresponding fractionation of the outlet grid for the gas, each fraction corresponding to a grid element capable of being easily shaken from outside; these devices being, moreover, susceptible of combination with an appropriate number of outlets of gas from the ashpit and of charging hoppers for high-power apparatus [in which case] they should, consequently, be very long.

France 525,068

**PROCESS AND GAS GENERATOR FOR THE PRODUCTION OF PURE CARBON MONOXIDE**

André Helbronner, France

*May 27, 1921; application filed in Paris Apr. 2, 1920.*

Gr. 15, Cl. 3.

The present invention concerns:

(1) A process for the production of pure carbon monoxide, characterized by the fact that fuel gases are used in a firebox burning any type of fuel, and by the fact that the carbonic acid contained in these gases are caused to be absorbed by an alkaline carbonate which is transformed into bicarbonate, which appropriately heated, yields a reuseable carbonate and pure carbonic acid which is converted into pure carbon monoxide by reaction on coal heated in a closed oven.

France 526,311

**IMPROVEMENT IN SLAGGING GAS GENERATORS**

Henri-Jean-François Philipon and Auguste Dessemond, France

*June 29, 1921; application filed in Paris Oct. 21, 1920.*

Gr. 15, Cl. 3.

The invention concerns the use of a hot blast in slagging gas generators with a view to obtaining apparatus which can burn small quantities of fuels having any content of ash, at the same time achieving a temperature suitable for the fluidity of the slag and its easy removal.

France 528,582

**APPARATUS FOR DRY DISTILLATION AND GAS GENERATOR**

Fernand-Émile Lefebvre, France

*Aug. 20, 1921; application filed in Paris on Dec. 14, 1920.*

Gr. 15, Cl. 3

The subject of the present invention is an apparatus for dry distillation and a gas generator characterized essentially by the fact that the introduction of air or comburent gas into the combustion zone is brought about by one or several orifices with small cross sections, in such fashion as to produce inside the apparatus one or several air jets for high-speed combustion, forming a sort of blowpipe, the flame or flames of the blowpipe spreading out and producing a high-temperature zone favorable for the production of gas with a relatively high calorific power.

France 529,887

**PROCESS FOR PREVENTING DIFFICULTIES IN THE OPERATION OF GAS GENERATORS EQUIPPED FOR EVACUATION OF THEIR LIQUID SLAG**

Georgs-Marien Bergwerks und Hütten-Verein A.G., Germany

*Sept. 19, 1921; application filed in Paris Jan. 17, 1921.*

*Application filed in Germany on July 19, 1916.*

Gr. 15, Cl. 3

The present invention concerns:

(1) A process for preventing difficulties in the operation of gas generators equipped for evacuation of [their] liquid slag, characterized by the use of an addition of metal which prevents premature cooling and, as a result, the solidification of the slag.

France 530,436

**PROCESS FOR THE PREPARATION, BY INTERMITTENT OPERATION, OF AN OIL GAS OF THE WATER-GAS TYPE, WITH RECOVERY OF THE TARRY BYPRODUCTS THEREOF**

Dellwik Fleischer Wassergas G.m.b.H., Germany

*Oct. 1, 1921; application filed in Paris Feb. 1, 1921.*

*Application filed in Germany Feb. 13, 1920.*

Gr. 15, Cl. 3

The present invention concerns a process for the preparation, by intermittent operation, of a rich gas of the water-gas type starting with a bituminous fuel, with recovery of the tarry byproducts thereof, characterized by the fact that the blast gases conducted in a known manner only through the part of the fuel which produces the water gas, and are evacuated with the aid of an offtake pipe which penetrates as far as the core of the gasified fuel.

France 530,962

**GAS GENERATOR OF LARGE DIMENSIONS WITH TURNING GRATES FOR THE PRODUCTION OF WATER GAS, PRODUCER GAS, OR OTHER GASES STARTING WITH SOLID FUELS**

Eugen Dolensky, Germany

*Oct. 12, 1921; application filed in Paris Feb. 12, 1921.*

*Application filed in Germany on Feb. 21, 1917.*

Gr. 15, Cl. 3

The invention concerns gas generators of large dimensions with turning grates for the production of gases starting with solid fuels, characterized by the arrangement of fire bridges, partitions, etc., in such manner as to subdivide the lower part of the shaft, and by the use of a turning grate in each of the compartments thus created.

France 531,989

**IMPROVEMENTS BROUGHT ABOUT IN THE PRODUCTION OF A MIXTURE OF GAS FROM THE DISTILLATION OF COAL AND WATER GAS**

Hugo Strache, Austria

*Nov. 4, 1921; application filed in Paris Jan. 13, 1921.  
Application filed in Austria Jan. 13, 1921.**Gr. 15, Cl. 3*

The invention concerns improvements brought about in the production of a mixture of gas from the distillation of coal and water-gas, the said improvements consisting principally—at the same time that the water gas is led into a retort which is placed at the upper part of the gas generator and which, during the period of blowing of hot air, is heated externally—of collecting, during the blowing of hot air, the distillation gases into a free space of which the offtake pipe is closed, and of forcing these gases outside this free space only during the steam injection period and after opening the offtake pipe, by the water gas produced by means of this injection; the offtake pipe next being maintained open at the beginning of the period following the blast until total evacuation outside the above-mentioned free space of the mixture of distillation gas and water gas.

France 531,990

**IMPROVEMENTS BROUGHT ABOUT IN THE DISTILLATION OF COAL IN GAS GENERATORS WITH ALTERNATING SERVICE**

Hugo Strache, Austria

*Nov. 4, 1921; application filed in Paris Jan. 13, 1921.  
Application filed in Austria June 28, 1916.**Gr. 15, Cl. 3*

The invention consists of improvements brought about in the distillation of coal in gas generators with alternating service, the said improvements consisting principally—at the same time that they consist in having recourse to gas generators the distillation chamber of which is externally heated—in injecting during the gasification period steam at the place where the distillation chamber empties into the gas generator shaft. It envisages, more particularly, certain methods of carrying out the said improvements, and further, more particularly, and this by way of new industrial products, gas generators including the application of these same improvements, as well as the special elements appropriate for establishing them.

France 533,908

**IMPROVEMENTS IN GAS GENERATORS, PARTICULARLY IN THOSE OF REINFORCED CONCRETE**

Otho Robert Verity, Italy

*Dec. 22, 1921; application filed in Paris Apr. 8, 1921.  
Application filed in Italy May 18, 1920.**Gr. 15, Cl. 3*

The invention concerns improvements in gas generators, particularly in those of reinforced concrete, the said improvements consisting principally in causing the shaft of the gas generator to rest on the lower edge of a jacketing which is itself supported by vertical pillars. It is aimed more particularly at certain methods of executing these improvements, and still more particularly, and this by way of new industrial products, at gas generators of the type in question including the application of the said improvements and the special elements appropriate for their establishment.

France 534,249

**IMPROVEMENTS IN THE BOTTOMS OF THE CHAMBERS OF WATER-GAS GENERATORS AND OTHER CHAMBERS**

Humphreys and Glasgow, Ltd., England

*Jan. 3, 1922; application filed in Paris Apr. 19, 1921.  
Gr. 15, Cl. 3*

The invention includes:

An internally conical bottom for a chamber, constituted by means of bricks the two opposite faces of which are conical both in a lengthwise and thicknesswise direction of the brick, and the upper and lower surfaces of which, as well as the two extremities of which are respectively parallel, the said bricks having one of their end parts cut away in relation to the other.

France 534,601

**IMPROVEMENTS IN INSTALLATIONS AND PROCESSES INTENDED FOR THE GASIFICATION OF COAL AND OTHER CARBONIFEROUS MATERIALS**

Woodall, Duckham &amp; Jones (1920), Ltd., and Sir Arthur MacDougall Duckham, England

*Jan. 9, 1922; application filed in Paris Apr. 25, 1921.  
Patent application filed in England on Apr. 28, 1920.  
Gr. 15, Cl. 3*

This invention includes:

(1) A process of gasification of coal or of an analogous body, according to which the material, after carbonization in an externally heated vessel, passes directly to a generator where the residue is converted into water gas which, in its sum or in part, traverses the retort and is mixed with the coal gas during its passage in the retort, characterized by the fact that any desired proportion of this water gas, before or after mixture with the coal gas, can be used for the external heating of the carbonization vessel, in order to assure proper distillation of the hydrocarbons in the coal, before the residue shall have entered the generator.

France 534,634

**IMPROVEMENTS IN INSTALLATIONS FOR THE GASIFICATION OF FUELS**

Woodall, Duckham &amp; Jones (1920), Ltd., and Sir Arthur MacDougall Duckham, England

*Jan. 9, 1922; application filed in Paris Apr. 26, 1921.  
Application filed in England May 14, 1920.  
Gr. 15, Cl. 3*

The invention includes, in an installation for the total gasification of a fuel of the type described in the text hereof, a method for rendering approximately constant the ratio between the pressure prevailing in the upper part of the retort and that prevailing in the upper part of the gas generator, the said method consisting of supplying the offtake pipe of the retort with an hydraulic seal and of rendering the depth of the seal a function of the pressure of the gas in the upper part of the gas generator.

France 535,000

**IMPROVEMENTS IN GAS GENERATORS**

Otho Robert Verity, Italy

*Jan. 17, 1922; application filed in Paris Apr. 8, 1921.  
Application filed in Italy May 18, 1920.**Gr. 15, Cl. 3*

The invention concerns improvements in gas generators, the said improvements consisting, principally, of assuring the extraction of the ashes or analogous products with the aid of a fluid under pressure such as, for example, water, air, or steam, the said fluid being capable of acting in a continuous or intermittent manner; and of arranging in the hydraulic joint at

the lower part of gas generators an inclined plane on which the ashes will fall and from which the said ashes will be driven by a fluid under pressure acting on all or on a part of the said inclined plane.

France 536,047

**APPARATUS FOR AUTOMATIC CHARGING AND STIRRING OF FUEL IN GAS GENERATORS**

Anciens Établissements Loy & Aubé, France

Feb. 4, 1922; application filed in Paris May 27, 1921.  
Gr. 15, Cl. 3

The invention consists of a gas generator with a fixed shaft characterized by the fact that its arch is mounted in such fashion that it can turn and carrying a distributor of fuel, as well as the appropriate mechanisms for distributing and stirring the fuel in the shaft.

France 536,182

**GAS GENERATOR WITH SEPARATE REACTIONS**

Henri Danon, France

Feb. 7, 1922; application filed in Paris Apr. 23, 1921.  
Gr. 15, Cl. 3

The invention concerns the use of a part of the fuel gases produced by a gas generator, and this in a separate enclosure of the hearth of this apparatus, and their mixture with air, in order to assure their combustion, the burned bases thus produced being next returned to the gas generator and placed in contact with the fuel contained in the firebox of that apparatus in order, through this contact, to assure reactions the aim of which is the production of fuel gas, a part of which will be directly used in the utilization apparatus served by the gas generator and the other part of which will be derived for the purpose indicated above; the principal advantages of all these arrangements being the avoiding in so far as possible the forming of carbon dioxide in the gas generator and, consequently, of decreasing the temperature in the firebox and avoiding the disadvantages resulting from a high temperature; of causing the gas generator to function with a low thickness of fuel; and of making it possible to use powdered fuels or fuels charged with volatile materials, or high ash fuels, or fuel wastes.

France 537,545

**IMPROVEMENTS IN PRODUCER-GAS GENERATORS**

J. & O.-G. Pierson, France

Mar. 6, 1922; application filed in Paris Jan. 15, 1921.  
Application filed in Belgium on Nov. 21, 1913.  
Gr. 15, Cl. 3

The invention concerns improvements in producer-gas generators [operating] by open-hearth draft, consisting of admitting air and steam throughout the entire cross section of the fire, the air and steam being likewise susceptible of admission in the ordinary manner around the cone for causing the fuel to drop down.

France 538,162

**AUTOREGULATOR APPARATUS FOR THE CONTINUOUS PRODUCTION OF WATER GAS**

Maurice-Félix Hunecu, France

Mar. 15, 1922; application filed in Paris July 12, 1921.  
Gr. 15, Cl. 3

The invention concerns a continuously operating apparatus for the production of water gas, in which the heat necessary to maintain combustion is supplied by the combustion of a part of the gas produced.

It includes a boiler with a variable vaporization surface heated by the gases burned having served for the heating of the retort. Automatic regulation of production is obtained by automatically variable feeding of the boiler.

France 538,581

**IMPROVEMENTS IN THE INTERIOR LININGS OF GAS GENERATORS**

Ferrolite, Ltd., England

Mar. 21, 1922; application filed in Paris July 21, 1921.  
Two applications filed in England Dec. 2, 1920, and Apr. 15, 1921.

Gr. 15, Cl. 3

The invention concerns an interior lining for gas generators, formed of chromite, or of chromite and ferrosilicon ground to an appropriate size and mixed with a binder, for example an alkaline silicate, the said lining being applied in a plastic state and packed or tamped around a central core.

France 544,217

**ROTATING GRATE FOR GAS GENERATORS, SHAFT OVENS, ETC.**

Hermann Goehtz, Germany

June 16, 1922; application filed in Paris Dec. 5, 1921.  
Gr. 15, Cl. 3

The subject of the invention is a rotating grate presenting construction in the form of a shaft for gas generators, shaft ovens, etc., characterized by the fact that a body extends throughout the cross section of the shaft and includes pipes for evacuating the ashes which are approximately radial or tangential.

France 544,308

**IMPROVEMENTS IN THE CONSTRUCTION OF GAS GENERATORS**

Samuel Moore and Mrs. Hunter née Charlotte Smith, England

June 20, 1922; application filed in Paris Dec. 8, 1921.  
Gr. 15, Cl. 3

The present invention concerns gas generators of the type in which water gas and coal gas are produced in a single apparatus including a retort for the production of coal gas and a generator for the production of water gas. The invention is aimed at combining, in the said apparatus, the following various organs:

A feed hopper for fuel controlled by a shutter gate, a mechanism for discharging the coke or the ashes, the two last-named mechanisms being placed respectively in the upper part and the lower part of the apparatus; a device intended to extinguish the coke, constituted by a system which lets water fall drop by drop, or by a steam injector, means for injecting liquid hydrocarbons when extraordinary enrichment is required, a chamber in which steam is formed, a superheater, heating chambers traversed by secondary currents of air, a series of regenerators in the baffle formation, in which combustion takes place, and mechanisms to control the upper and lower cycles of the gases.

France 545,431

**PROCESS FOR THE COOLING OF INCANDESCENT COKE WITH SIMULTANEOUS RECOVERY OF WATER GAS AND STEAM**

Sulzer Frères, S.A., Switzerland

July 20, 1922; application filed in Paris Dec. 31, 1921.  
Application filed in Switzerland Jan. 3, 1921.  
Gr. 15, Cl. 3

The invention includes:

A process for cooling incandescent coke, the said process characterized by the fact that heat is used for the formation of the water gas, the said heat being withdrawn into a higher temperature zone with a quantity of coke poured into a receiving device, while the heat withdrawn into a lower temperature zone is used with the same quantity of coke to produce the necessary steam for the formation of water gas with

a view to rendering unnecessary a special source of heat for the production of the steam.

France 545,432

**RECEIVING DEVICE FOR DRY COOLING OF COKE BY A CURRENT OF NEUTRAL GASES CIRCULATING IN A TEMPERATURE EXCHANGER**

Sulzer Frères, S.A., Switzerland

July 20, 1922; application filed in Paris Dec. 31, 1921.  
Application filed in Switzerland Jan. 3, 1921.

Gr. 15, Cl. 3

The invention includes:

A receiving device for dry cooling of coke by means of a current of neutral gases circulating through a temperature exchanger, this receiving device being characterized by the fact that the part, constituting the bottom of the receiving device which receives the coke and can be progressively emptied, is composed of two funnels arranged on the same axis in relation to the receiving device, the lower funnel being provided with an emptying device and the cooling gas being blown through the space located between the two funnels through the coke, in order to avoid, on the one hand, by means of the hopper-shaped space, a choking of the inlet pipe of the cooling agent by the coke, and on the other hand, to achieve uniform blowing of the coke throughout the entire cross section of the receiving device, and, moreover, to make it possible to empty the receiving device by layers.

France 545,813

**PROCESSES AND APPARATUS MAKING IT POSSIBLE TO CHARGE WITH STEAM THE AIR DESTINED FOR THE MANUFACTURE OF GAS IN GAS GENERATORS**

Victor Léon Cazes, France

Aug. 2, 1922; application filed in Paris Jan. 12, 1922.

Gr. 15, Cl. 3

The invention consists of . . . a process for charging with steam the air destined for the manufacture of gas in gas generators, a process characterized by the fact that water is sprayed in a current of air previously heated at a proper temperature, the gaseous mixture thus obtained being next admitted into the gas generator.

France 548,428

**DISCONTINUOUS WATER-GAS GENERATOR**

Heurtey et Sauvageon (Associés en Nom Collectif), France  
Oct. 21, 1922; application filed in Paris June 8, 1921.

Gr. 15, Cl. 3

The invention concerns a cyclic generator for carbureted or noncarbureted water-gas, the characteristics of which are . . . as follows:

(1) Arrangement of the active fuel bed between two regenerators, one constituted by ducts of refractory pieces, the other by a thick layer of slag, the purpose of which is to return alternatively to the reaction chamber the heat removed by the combustion gases during the heating period and the heat removed by the water gas during the production period.

France 548,601

**DEVICE FOR ELIMINATING SLAG IN A LIQUID STATE IN GAS GENERATORS**

Compagnie Generale de Construction de Fours, France  
Oct. 26, 1922; application filed in Paris July 13, 1921.

Gr. 15, Cl. 3

The present invention consists of the combination with the lower part of the shaft of a gas generator with one or several lateral extensions or enlargements of the said shaft constituting combustion chambers free of all nonmolten slag and fuels, the said combustion chambers being independently fed with gaseous,

liquid, or solid fuel and air, making it possible to achieve with complete certainty the high temperature necessary to obtain the fusion of the slag coming from the gas generator, normally blown, on the other hand, by air in conjunction with steam; the burned gases coming from the combustion chamber mixing themselves in the apparatus for the burned gases which result from the action in the zone of the blast orifices for the air blown on the incandescent fuel and being swept along at the same time and for the same purpose as the said gases, in order to be reduced in the upper part of the apparatus into fuel gas by the incandescent carbon, following the normal reactions of gas generators, the effect of fusion of the slag being achieved with complete certainty as a result of the foregoing, and without any substantial disadvantage in so far as the thermic production of these apparatus is concerned.

France 550,325

**PROCESS FOR SLAGGING GASIFICATION OF COALS, LIGNITES, AND BITUMINOUS FUELS WITH A VIEW TO THE RECOVERY OF THE BYPRODUCTS AND PRODUCTION OF A RICH GAS WITH A CONSTANT COMPOSITION AND ON THE BASIS OF CONTINUOUS OPERATION**

Société Anonyme de Construction de Fours à Coke (SIMPLEX), Belgium

Dec. 11, 1922; application filed in Paris Apr. 19, 1922.

Gr. 15, Cl. 3

The invention consists of a process for slagging gasification of coals, lignites, bituminous schists, etc., with any and all content of ash, for the purpose of recovery of the byproducts (light tars, hydrocarbons, ammonium, etc.) and of the simultaneous production of only one gas with a low carbonic acid content and high calorific value, on the basis of continuous operation; characterized, moreover, by:

(1) The most appropriate temperature regime in the gas chamber being of a permanent nature, with maximum recovery of the light tars, hydrocarbons, ammonia, etc., without fear of a decomposition of the said byproducts, resulting from other special characteristics.

France 550,930

**IMPROVEMENTS IN THE MANUFACTURE OF GAS**

Humphreys and Glasgow, Ltd., England

Dec. 23, 1922; application filed in Paris May 3, 1922.

Gr. 15, Cl. 3

The invention includes:

A process for using heavy oil in the manufacture of gas, this process consisting of gasifying heavy oil by introducing it into a checkerwork of previously heated bricks, and of consuming the carbon deposit thus formed with the aid of a current of air heated beforehand, for example by causing a current of air to pass in an inverse direction through the checkerwork of bricks; this process being further characterized by the following individually or in combination: (1) alternating inverse blowing with normal blowing in such fashion as to regulate the heat of the checkerwork; (2) admitting the heavy oil into the checkerwork of heated bricks at separate points so as to distribute the deposits of carbon, with the objective of facilitating their combustion by the current of air.

France 551,785

**IMPROVEMENTS IN GENERATORS OF GAS WITH FUSION OF ASHES**

Georges Marconnet, France

Jan. 13, 1923; application filed in Paris May 20, 1922.

Gr. 15, Cl. 3

The present improvements brought about in genera-

tors of gas with fusion of ashes are, principally, as follows:

(1) Means, the effect of which is to maintain the fusion zone in the neighborhood of the hearth and the blast orifices constituted by vertical pushing devices causing the charge to descent, in combination with horizontal pokers placed permanently in the blast orifices, the said vertical pushing devices and the said horizontal pokers being periodically moved by hand or by an appropriate mechanical device.

France 551,973

**IMPROVEMENTS IN PROCESSES AND APPARATUS FOR GASIFYING BITUMINOUS FUELS**

Albert Breisig, Austria

*Jan. 16, 1923; application filed in Paris May 24, 1922.  
Application filed in Austria May 25, 1921.*

*Gr. 15, Cl. 3*

The invention concerns a process and apparatus for obtaining total gasification of bituminous fuels in gas generators of the alternate operation type, by using with the aid of a superheater the heat lost from the blowing gases; the said invention consisting principally of causing the mixture of water gas and distillation gas produced during gasification to pass into heat accumulators in which the heat proper and the heat from combustion of the gases in the gas generator have been accumulated, and to lead this mixture back into the charge of fuel and this at the place of junction of the gas generator and the distillation chamber in order to lead back, in a closed cycle, the gases loaded with heat into the said charge of fuels.

France 552,049

**PROCESS FOR THE GASIFICATION AND CARBONIZATION OF COAL AND OTHER FUELS**

Société Lyonnaise des Eaux et de l'Éclairage, France

*Jan. 17, 1923; application filed in Paris Oct. 7, 1921.*

*Gr. 15, Cl. 3*

A process for the gasification and carbonization of coal and other fuels, characterized by:

(1) Continuous blowing of extremely finely divided coal in chambers heated red hot;

(2) The simultaneous injection of hydrogenous gas in such fashion as to maintain in the atmosphere in the chamber a persistent partial pressure of hydrogen higher than that which would result from the dissociation of the hydrocarbon elements contained in the coal or which are released during its pyrogenation.

(3) The evacuation of the gases produced, without filtration, through a crust or thickness of red coke.

(4) Regulation of the temperature and the flow of the hydrogenous gas, in such fashion as to successively favor hydrogenation of the nonsaturated hydrocarbons, then their decomposition into gases carbureted in an excess of hydrogen, and finally the direct combining of one part of the residual carbon with the excess hydrogen.

France 552,100

**IMPROVEMENTS IN THE MANUFACTURE OF WATER GAS**  
Trent Process Corporation, U.S.A.

*Jan. 17, 1923; application filed in Paris May 26, 1922.  
Application filed in the U.S.A. on June 21, 1921.*

*Gr. 15, Cl. 3*

The invention consists of a process for the manufacture of water gas in which a generator is charged with a material with a carbon base, steam and air being alternately sent through the bed of fuel with a carbon base in a state of ignition, characterized by the fact that the fuel is introduced into the generator in a finely divided form, during the periods of manufacture of the gas, in such fashion that the volatile products of the fuel which arrive in the generator are vaporized

and evacuated from the generator, before the subsequent blowing periods.

France 552,151

**PROCESS FOR THE MANUFACTURE OF FUEL GASES**

Pierre-Hugo Ledebøer, France

*Jan. 17, 1923; application filed in Caen Oct. 13, 1921.  
Gr. 15, Cl. 3*

Process for the manufacture of fuel gases, characterized by the use of a very finely pulverized fuel injected with the steam into a gasification chamber, the refractory walls of which are heated at a temperature higher or at least equal to that of the production of water gas;—the fuel being of any type whatsoever, used alone or in mixture with one or several others;—the gasification chamber being susceptible of being heated either by the combustion of a part of the pulverized fuel intended for gasification, or by an external heat source; this chamber susceptible of being internally free, or filled with fragments of refractory materials leaving spaces between each other;—the dimensions of the chamber being susceptible of being any dimension desired according to the manufacturing requirements;—it being possible for the powdered fuel admitted to receive fuel of the same type or of different types; and it being possible for the gases obtained to be treated, if warranted, by the recovery of byproducts engendered at the same time.

France 552,821

**AUTOMATIC AIR-ADMISSION REGULATOR FOR GAS GENERATORS WITH AIR BLAST**

Léon Tréfois, Belgium

*Jan. 30, 1923; application filed in Paris June 13, 1922.  
Application filed in Belgium June 17, 1921.*

*Gr. 15, Cl. 3*

The subject of the invention is a device for the automatic regulating of the admission of air in gas generators which operate under the influence of pressure variations produced in the gas-outlet pipes.

The system includes a water-sealed bell so mounted on the gas offtake pipe of the gas generator as to rise and fall with fluctuations in the pressure within this pipe and connected by cable or any other manner to a throttle valve placed in the air-admission pipe.

France 552,877

**IMPROVEMENTS IN GENERATORS OF GAS WITH ASH FUSION**

Anctole Fichet, France

*Jan. 31, 1923; application filed in Paris Nov. 7, 1921.  
Gr. 15, Cl. 3*

The purpose of the invention is a slagging gas generator, characterized by the fact that . . . the sloping surfaces of the bosh above the hearth are extended as far as the arch and the charging holes are in such relationship to the walls as to provide a continuous thin sheet of coal and, at the same time, an extensive surface for disengagement of the gas; and by the fact that the cross section of the crucible is rectangular or elongated, which makes it possible for blowing to occur at less pressure and to assure a better distribution of air throughout the mass.

France 553,894

**GAS GENERATOR WITH AUTOMATIC STEAM-GENERATING EQUIPMENT AND REVERSIBLE BLOWING, FOR THE MANUFACTURE OF WATER GAS**

Société Veuve Descours & Fils, France

*Feb. 20, 1923; application filed in Lyon July 12, 1922.  
Gr. 15, Cl. 3*

The invention consists of a gas generator with automatic steam-generating equipment and reversible



blowing, for the manufacture of water gas in small industrial plants, including a chamber of refractory masonry, in which the fuel is placed by means of an appropriate opening; air ducts located below and above the mass; a pipe for the introduction of steam under the grate; a water-circulation grate; a steam boiler placed in the path of the combustion gases, evacuated from the gas generator by means of a single vent, controlled by two flap valves, the steam used in the gas generator originating from the boiler and a single blower.

France 554,272

GAS GENERATOR

Charles-Marie Stein, France

Feb. 27, 1923; application filed in Paris Nov. 30, 1921.  
Gr. 15, Cl. 3.

The invention concerns a generator apparatus for the total gasification of coal, including a shaft at the top of which the distillation of the coal takes place, whereas at the lower part the coke resulting from the distillation is converted to water gas the said shaft being surrounded by a double jacketing forming an annular chamber containing a boiler heated by the products of combustion emitted during the periods of heating of the coke, in such fashion that total gasification takes place without any consumption of coal or any other fuel outside the generator.

France 554,476

IMPROVEMENTS RELATING TO THE PROCESS AND APPARATUS FOR MANUFACTURING FUEL GASES

Mrs. Charlotte Hunter née Smith, England

Mar. 2, 1923; application filed July 26, 1922, in Paris.  
Gr. 15, Cl. 3

The invention includes:

(1) A process for the manufacture of mixed water and coal gas in a gas generator of the vertical type, in which, after air has been forced through the incandescent fuel in the chamber which generates the water gas, the steam for the production of the water gas is admitted by the lower part of the apparatus into the incandescent fuel, the water gas produced being driven toward the top through the coal being carbonized in the vertical coal-gas retort above the said chamber; the mixture of gas thus obtained being discharged from the apparatus, during the said ascending phase, by means of a discharge at the top of the apparatus; the characteristic of which is that, after the following forcing of air, the following admission of steam for the production of water gas will take place by the upper part of the apparatus in the top of the coal-gas retort, and will be forced, from there, toward the bottom through the coal being subjected to carbonization in the said retort, and, from there, into the incandescent fuel in the chamber for generating water gas, the mixed water and coal gas resulting from this down-driving action being discharged from the apparatus (during this descending phase) by means of a discharge opening at the base of the apparatus, and so on, in alternating ascending and descending drafts.

France 555,630

IMPROVEMENTS IN GAS GENERATORS

Edmond Hanappe, Belgium

Mar. 27, 1923; application filed in Paris Sept. 2, 1922.  
Gr. 15, Cl. 3

The invention concerns a gas generator with a moveable coking grate characterized by the fact that the coking grate, supported at its central portion, can be turned or shaken from outside around a vertical axis.

The present gas generator can also be characterized by the fact that . . . the moveable coking plate bears a vertical axis traversing the bottom of the ashpit and

furnished with a lever which makes it possible to shake the coking plate from outside.

France 556,456

PROCESS AND DEVICE FOR THE OBTAINING OF A MIXTURE OF GAS IN TWO GAS GENERATORS

Werner Alfred Paul Berg, Japan

Apr. 14, 1923; application filed in Paris, Sept. 22, 1922.  
Gr. 15, Cl. 3

The invention concerns a process and a device for obtaining a mixture of gas in two gas generators, in which the gas obtained in one of the generators is superheated by the blast gases before entering the second gas generator, and by a device for the application of the process whereby a superheater is introduced between the two gas generators and is heated by the blast gases and serves for superheating of the gases originating from the first gas generator.

France 557,252

IMPROVEMENTS IN THE MANUFACTURE OF HYDROGEN OR OF GASES RICH IN HYDROGEN

Seiichi Takahata, Société Tully Gas Plants, Ltd., John Henry West, and Arthur Jaques, England

Apr. 30, 1923; application filed in Paris Oct. 10, 1922.  
Application filed in England on Oct. 13, 1921.  
Gr. 15, Cl. 3

The present invention concerns a process for the production of hydrogen by means of the complete gasification of coal, a process in which carbonization of the fuel in a retort is followed by treatment of the carbonized fuel in another part of the apparatus with steam for the production of water gas, and with air for the combustion of that part of the charge of fuel intended for maintaining the reaction of the gas to water, this process being further characterized by the fact that . . . the retort and gas-generator parts of the apparatus are arranged in open communication with one another in such fashion as to permit continuous passage of the carbonized coal from the retort into the gas generator, while the dissociation of the steam and of the gases produced during carbonization of the coal in the chamber of the retort takes place by conducting them next in a descending direction through the zone of maximum temperature located at the part or near the part of the fuelbed which is at the base of the retort part and at the top of the gas generator part of the apparatus; and that the method of admission and the quantities of steam and air used are regulated in an appropriate manner, so that the temperature diminishes progressively from that maximum temperature zone downward to a relatively low temperature prevailing in the base of the chamber of the gas generator where the gases are removed, so that the principal reactions which take place—namely, the reaction of the water gas and the direct combustion of one part of the carbonized fuel into carbon monoxide, are executed in such a manner as to favor, in their final result, the oxidation of the carbon into carbon dioxide, in such fashion that the gases obtained shall contain a relatively high proportion of carbon dioxide.

France 559,755

DISCHARGING DEVICE FOR GAS GENERATORS

Metallbank und Metallurgische Gesellschaft A. G., Germany  
June 21, 1923; application filed Dec. 13, 1922. Two applications filed in Germany on Jan. 30 and Oct. 16, 1932.

Gr. 15, Cl. 3

The discharging device for gas generators is essentially characterized by a plate revolving around one of its points, and the axis of rotation of which

revolves simultaneously around the axis of the shaft of the gas generator.

The invention is also characterized by the fact that . . . the ashpit controls the grate by means of an eccentric notch; and that the ashpit is provided with a wall protecting the contact surface between the system of the grate and the ashpit, against access by water and ashes; and that the grate system is connected to the ashpit in a concentric manner; and that the rotation of the grate around its own axis takes place independently of the rotation of the ashpit, for example, by means of a special control, or by friction, etc.

France 560,163

**COMPLETE GAS GENERATOR WITH REVERSING OF FLAMES**

Stephen Blérard and Pierre Breuillé, France

*June 30, 1923; application filed in Paris Dec. 22, 1922.*

*Gr. 15, Cl. 3*

This invention concerns a complete gasification generator—that is, one which fulfills the conditions most nearly approximating the ideally operating gas generator—the said apparatus being characterized by:

Discharge of the gases at a high temperature owing to the fact that the said discharge takes place in the vicinity of the complete combustion zone of the gas generator;

A complete cooling of the combustion zone resulting from the said discharge, making it possible to regulate the temperature of the said zone at a degree of heat lower than the fusion temperature of the slag.

A reserve of fuels placed in the path of the gas produced;

A horizontal grate in the case of a fixed gas generator, or a vertical grate in the case of a moveable gas generator;

A full wall next to the vertical grate channeling air in a vertical direction with the objective of heating it by radiation and of regulating the pressure at the different levels of this vertical grate.

France 561,134

**ROTATING GRATE FOR GAS GENERATORS**

Franz Kühnl, Czechoslovakia

*July 28, 1923; application filed in Paris Jan. 17, 1923.*

*Gr. 15, Cl. 3*

The invention consists of a rotating grate for gas generators, constituted by a cone with steps, operating with a slight incline toward the outside, and with blast orifices in the risers of the steps, characterized essentially by the fact that the axis of the blast orifices forms an acute angle with the risers of the steps in such fashion that the current of air emerging from the blast orifices passes above the risers of the steps at a distance which increases gradually as it goes toward the outside.

France 561,584

**GAS GENERATOR**

Gustave Chambet, France

*Aug. 10, 1923; application filed Jan. 30, 1923, in Paris*

*Gr. 15, Cl. 3*

The invention concerns a gas generator in which the body of the gas generator, above the usual grate and the usual ashpit, is traversed at an appropriate height by a set of pipes forming a pocket which receives water and communicates with a chamber surrounding the discharge pipe of the gases and itself connected to the ashpit.

It further concerns . . . the arrangement, on the generator body, of a charging hopper that may be emptied by means of a foot valve and filled at the

top through a lid, and communicating with a vent by means of a regulatable opening.

France 562,097

**IMPROVEMENTS IN THE MANUFACTURE OF ORE BRIQUETTES, FUELS, OR OTHER TYPES OF BRIQUETTES, AND THE APPARATUS USED FOR SUCH MANUFACTURE**

Andrews and Co., Ltd., England

*Aug. 25, 1923; application filed Feb. 13, 1923 in Paris.*

*Application filed in England Feb. 18, 1922.*

*Gr. 15, Cl. 3*

This invention includes:

(1) In the manufacture of ore, fuel, and other types of briquettes, making use of residual sulphite solution as an agglutinant, a process which consists of heating the briquettes formed in a bath of molten metal, at approximately 450° C.

(2) In combination with the process specified under (1), transporting the briquettes at a determined speed, in such manner that they shall, first, be exposed to air or to hot gases, and then pass across the bath of molten metal.

France 562,348

**PROCESS FOR THE CARBONIZATION OR GASIFICATION OF FUEL BY MEANS OF ZONES**

William Everard Davies, England

*Aug. 31, 1923; application filed in Paris Feb. 17, 1923.*

*Gr. 15, Cl. 3*

The invention concerns a process for the gasification or carbonization of fuels, characterized by heating the charge by means of separate zones through one of the walls, sides, or limits enveloping the load; and by means of disengagement or evacuation staged by one wall or the other, of the gases generated and of the steam of the distillation coming from the retort; the said wall being also perforated by zones or sections; and by the equilibrated constitution of the walls, sides, or limits of the chamber containing the fuel. The retort shall be rectangular or square in its cross section; the heat is conducted to it by one of the sides, while from the other the evacuation of the distillation products takes place. The retort may have a circular or elliptical cross section and the heat is in such case led over the entire surface, or approximately the entire surface of the wall, while evacuation of the byproducts takes place by means of an appropriate central concentric device. Heating of the fuel is effected from outside by a part of the walls and from the inside by the appropriate arrangements, these two heatings being achieved by zones. These two heatings are combined in the same region of the wall or jacketing of the retort. For the internal heating of the load, flue gases are used, or steam, hydrogen, oxygen, air, internal gases, CO, CO<sub>2</sub>, hydrocarbons, or other gases introduced are used. Other gases are introduced to perform the special reactions in the fuel, in order to prevent such compounds as may be contained in the fuel, for example oxygen, from preventing the formation of the coke. Such gases as CO, CO<sub>2</sub>, hydrogen, etc., can be introduced either separately or in combination with steam.

France 563,351

**IMPROVEMENTS RELATING TO THE MANUFACTURE OF A GASEOUS FUEL DEPARTING FROM LIME-KILN GASES**

Thomas Anderson Reid, England

*Sept. 24, 1923; application filed in Paris, Mar. 6, 1923.*

*Application filed in England Apr. 18, 1922.*

*Gr. 15, Cl. 3*

The invention consists of the combination of a kiln for roasting limestone, or a similar carbonate, operating with producer gas, and of two gas producers each operating successively first as a generator to produce

the said producer gas, then as a converter, including the following essential characteristics:

(1) Means for introducing air or air rich in oxygen into the gases which leave the lime kiln and enter the converter, in such fashion that the carbon monoxide from the lime-kiln gases shall be burned and the temperature of the converter shall be maintained;

(2) Means for heating the said air beforehand by the heat released by the fuel gas obtained.

France 563,406

**IMPROVEMENTS IN THE PROCESS FOR THE MANUFACTURE OF GAS STARTING WITH COAL AND/OR OTHER SOLIDS AND/OR CARBONACEOUS MATERIALS**

Travers & Clark, Ltd., England

*Sept. 25, 1923; application filed in Paris, Mar. 8, 1923. Application filed in England Mar. 9, 1922.*

*Gr. 15, Cl. 3*

The present invention concerns a process for the manufacture of water gas consisting of heating a heat regenerator by means of the gas produced in the first manufacturing cycle during which air is blown onto coal; and of using this heat recuperator to heat the gas produced by the second cycle, in which steam is blown on the incandescent coke, in order to return this reheated gas into the mass of coal to be gasified.

France 563,582

**IMPROVEMENTS IN ASH-FUSION GAS GENERATORS**

Georges Marconnet and Compagnie Générale de Construction de Fours, France

*Sept. 28, 1923; application filed in Paris, June 14, 1922.*

*Gr. 15, Cl. 3*

In a slagging gas generator having one or several tap holes at one or two extremities, the arrangement of the tuyères following rows which are appropriately sloped toward the runoff holes.

France 566,178

**PROCESS AND APPARATUS FOR THE COMPLETE GASIFICATION OF FUELS**

Joseph-Émile Haennig, France

*Nov. 19, 1923; application filed in Paris, May 14, 1923.*

*Gr. 17, Cl. 3*

The invention concerns a process for the complete gasification of fuels making possible the production of a gas with a high calorific value and a very low carbon monoxide content, at the same time that possible recovery takes place of the nitrogenized and carburated byproducts of condensable hydrogen. This process consists of effecting distillation in an appropriate retort at the lower part of which is injected a mixture of steam and blowing air previously heated by circulation in the appropriate coils or enclosures subject to the heat of the gases originating from the gasification.

France 566,727

**IMPROVEMENTS IN GAS GENERATORS**

Jacques-Gustave Schulz and Henri-Jean-Marie Lorient, France

*Nov. 26, 1923; application filed in Paris, May 5, 1923.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator characterized by the fact that its bottom forms a reservoir in which is gathered the lower part of the load of fuel, air arriving in a convergent fashion at an appropriate height above the bottom of the said reservoir, the said height being such that the combustion zone formed in the mass of coal can develop both below and above the said blasts of air, in order that the air may reach into the very heart of the mass in ignition.

France 566,812

**IMPROVEMENTS IN THE PROCESSES AND APPARATUS FOR GASIFICATION OF BITUMINOUS FUELS**

Albert Breisig, Austria

*Nov. 27, 1923; application filed in Paris May 29, 1923.*

*Gr. 15, Cl. 3*

The invention concerns a process and apparatus for the gasification of bituminous fuels in gas generators with alternating operation, the said invention consisting principally:

Of superheating the mixture of water gas and products of the main distillation, engendered by the introduction of water gas into the retort, with the objective of transforming the products of the main distillation into products of gaseous distillation, which are no longer condensed at ordinary temperatures, and consequently to obtain a mixture of gas of a higher calorific power.

France 567,975

**IMPROVED GAS GENERATOR**

Gaston-Henri-Emmanuel Vigreux, France

*Dec. 14, 1923; application filed in Paris Sept. 14, 1922.*

*Gr. 15, Cl. 3*

The invention consists of a gas generator constituted by a hearth surmounted with air-inlet channels which traverse a jacketing of steam and water surrounding the said hearth, which is fed by a large reserve of fuel which, in distilling, emits steam collected in the appropriate chambers located at varying heights. The fuel resting on a flagstone under which is arranged a chamber where the gas exhaust pipes empty, the said gas being thus forced, before it emerges, to traverse a certain thickness of the fuel.

France 568,317

**IMPROVEMENTS IN GAS GENERATORS**

Frederick Joseph West, Ernest West, and the West's Gas Improvement Co., Ltd., England

*Dec. 20, 1923; application filed in Paris July 3, 1923.*

*Application filed in England Jan. 10, 1923.*

*Gr. 15, Cl. 3*

The invention concerns improvements in gas generators equipped with grates of the step type, in which gas generators the entire grate freely receives atmospheric air. . . . and characterized by the fact that . . . the position of the grate with steps in relation to the bed of material in combustion is such that the minimum distance between the grate and the said bed corresponds substantially to the middle of the grate.

France 569,524

**WATER-GAS GENERATOR WITH STEAM GENERATOR FUNCTIONING BY MEANS OF RECOVERED HEAT**

Henry Hug, France

*Jan. 7, 1924; application filed in Paris Aug. 7, 1923.*

*Gr. 15, Cl. 3*

The invention concerns a water-gas generator including a steam generator mounted on it and which functions by means of heat recovered from combustion gases and from combustible gases, the said gases being also able to serve to superheat the steam produced and to heat the water for feeding the steam generator.

France 572,773

**PROCESS FOR THE PRODUCTION AND UTILIZATION OF HYDROGENOUS MEDIA IN THE GASIFICATION OF COAL**

Société Lyonnaise des Eaux et de l'Éclairage, France

*Feb. 28, 1924; application filed in Paris Jan. 13, 1923.*

*Gr. 15, Cl. 3*

The invention concerns a production process, and a process of introduction and utilization of hydrog-

enous media in the gasification of coal, characterized by:

(1) The introduction beforehand around each particle of coal, charged in mass or pulverized form, of an atmosphere of hydrogenous gas such as to cause the partial concentration of hydrogen in that atmosphere to be higher than that which would result from the pyrogenized dissociation of the elements of each particle.

France 573,145

PROCESS FOR THE MANUFACTURE OF CARBURETED WATER GAS

Humphreys and Glasgow, Ltd., England

Mar. 5, 1924; application filed in Paris Nov. 15, 1923.  
Gr. 15, Cl. 3

The invention includes:

A process for the manufacture of carbureted water gas essentially characterized by the fact that atomized heavy oil is deposited onto a hot zone of an annular shape at the top of the fuel bed, which hot zone has been produced by the blowing of secondary air at the edge of the upper part, or above, of the bed in question, the heavy oil being gasified during the operation and the pitch deposited by it being coked and consumed during successive cycles.

France 573,175

PROCESS FOR THE MANUFACTURE OF CARBURETED GAS

Humphreys and Glasgow, Ltd., England

Mar. 6, 1924; application filed in Paris Nov. 16, 1923.  
Gr. 15, Cl. 3

The invention includes:

A process for the manufacture of carbureted gas consisting essentially of vaporizing a fog of atomized oil by means of the heat radiated by the walls of a vaporization chamber which is nonobstructed, in such fashion that the residue of the oil is deposited in a granular form in the bottom of the chamber, the walls of which should preferably be heated beforehand by internal combustion of a mixture of gas and air; and of carbureting a gas with this oil vapor by causing this gas to pass from top to bottom through the said chamber while the oil is atomized in the upper part thereof.

France 573,555

GAS GENERATOR WITH MIXED FUEL

Edmond Warnant, Belgium

Mar. 13, 1924; application filed in Paris Nov. 22, 1923.  
Gr. 15, Cl. 3

The invention consists of a gas generator for the production of producer gas, characterized by the fact that it consists of a gas generator with solid fuel, in the combustion zone of which a liquid, gaseous, or pulverized solid fuel can be injected, this with the purpose of being able to rapidly modify the rate of operation of the gas generator.

France 573,978

GAS GENERATOR WITH MECHANICAL POKING

Jean Sauvageot, France

Mar. 21, 1924; application filed in Paris Nov. 23, 1923.  
Gr. 15, Cl. 3

The invention consists of a gas generator equipped with a grate with mechanical poking, composed of bars with a transverse cross section, in star or semistar form, coupled, and rolling following their longitudinal axis.

France 574,183

PROCESS AND APPARATUS FOR THE GASIFICATION OF BITUMINOUS COAL AND OTHER ANALOGOUS MATERIALS

Humphreys and Glasgow, Ltd., England

Mar. 26, 1924; application filed in Paris Nov. 14, 1923.  
Application filed in the U.S.A. on June 7, 1923.  
Gr. 15, Cl. 3

The invention includes:

(1) A process for the gasification of bituminous coal, essentially characterized by:

(a) The establishment, in a fuel bed, of two hot zones; superheating of the gas engendered in one of the zones, by causing it to pass through the other zone, and carbonization of the bituminous coal by means of passage through it of the superheated gas; and by the fact that gasification of the fuel and carbonization of the coal are effected in separate vessels, or at different levels with a single vessel;

(b) Formation of the two hot zones in question by air blowing and preferably by causing air, or the forced air draft, to pass through a bed of coke in a fashion alternating from bottom to top and from top to bottom;

(c) Returning of the gas into circulation through the coke and the bituminous coal in alternation with the other operational cycles of the process in order to dry the fuel and reheat it.

France 574,305

PROCESS AND DEVICE FOR THE GASIFICATION OF COAL AND OF OTHER SOLID FUELS

Gorges Patart, France

Mar. 27, 1924; application filed in Paris Dec. 11, 1923.  
Gr. 15, Cl. 3

The invention concerns a process . . . which consists essentially of operating in the same apparatus, simultaneously but separately: on the one hand, the distillation of the coal by external heating obtained by means of any type of fuel gas and, on the other hand, gasification of the product of this distillation by varying, at will, during the very course of the operation and within the most extensive limits, the proportion and composition of the gaseous products supplied by each of the two stages, the said products being collected separately or mixed in any and all proportions or directed partially or totally through any one of the zones where the distillation and the gasification, respectively, are effected.

France 574,382

IMPROVEMENTS IN GAS GENERATORS

Céleste Gérard, France

Mar. 28, 1924; application filed in Paris Dec. 12, 1923.  
Gr. 15, Cl. 3

The present invention consists of a device intended to mechanically effect the regulation and the poking of gas generators, including a revolving grate principally characterized by the fact that arms mounted on a solid support of the revolving grate and of a determined height according to the nature of the coal used, constantly stir the incandescent mass.

France 574,760

PROCESS FOR THE CARBONIZATION AND GASIFICATION OF PEAT, LIGNITE, SAPROPEL, AND ANALOGOUS BITUMINOUS FUELS

Naamlooze Vennootschap Handelsonderneming (FEYNALD), Netherlands

Apr. 4, 1924; application filed in Paris Dec. 19, 1923.  
Application filed in Germany on Dec. 20, 1922.  
Gr. 15, Cl. 3

The invention concerns a process for the carbonization or distillation and gasification of peat, lignite,

sapropel, and analogous bituminous fuels, characterized by the fact that . . . in the said fuels are incorporated prior to carbonization certain catalyzers in a metallic state or their oxidized combinations; the fuel and the catalyzers are mixed in a dry state; the fuel in suspension in water is mixed with the dry catalyzers; the fuel in suspension in water is mixed with the catalyzers in suspension in water; the dry fuel or fuel in suspension in water is treated with colloidal solutions of catalyzers; the fuel is treated with a metallic salt solution, and the metals or their oxidized combinations are separated in the fuel by precipitation, heating or some other known manner; the catalyzer is separated from the metallic combinations contained in the fuel, either in the metallic state, or in the state of oxidized combinations, by precipitation at a high temperature, with or without pressure; and in the event that peat is obtained by the hydropeat process, the catalyzer is incorporated with the peat to be carbonized or gasified by the addition of injected water.

France 576,975

**PROCESS AND DEVICE FOR THE PRODUCTION OF WATER GAS AND STEAM**

Wilhelm Neu, Germany

*May 24, 1924; application filed in Paris Feb. 8, 1924. Gr. 15, Cl. 3*

The invention consists of a water-gas generator with steam boiler located above the said generator and heated by the hot blowing gases, characterized by the fact that the combustion chamber of the hot blowing gases is located directly above the filling of the gas generator, and that the device which directs the emerging gases is arranged behind channels of the boiler.

France 577,199

**PROCESS AND APPARATUS FOR OBTAINING, IN A GAS GENERATOR, A MIXED GAS WITH A HIGHER CALORIFIC VALUE BY REHEATING OF THE PRIMARY AIR**

Société Anonyme D'Exploitation des Brevets Cousin: Le Chauffage Industriel, France

*May 30, 1924; application filed in Paris Feb. 15, 1924. Gr. 15, Cl. 3*

The invention concerns:

(1) A process for operating a gas generator whereby the production of water gas in the said gas generator is principally characterized by the heating beforehand of the primary air, making it possible to produce in the gas generator a higher proportion of water gas, and the elevation of temperature of the gases produced which results from the reheating of the primary air correcting the effect of the endothermic reaction of the production of water gas, at the same time that the presence of the latter increases the calorific value of the gases.

France 577,390

**IMPROVEMENTS IN GAS GENERATORS**

Paul-Marie-André Beaudequin, France

*June 4, 1924; application filed in Paris Apr. 18, 1923. Gr. 15, Cl. 3*

The present invention concerns improvements in gas generators with reversed combustion.

The first [improvement] is aimed at condensing the moisture which is released from the fuel contained in the reserve of the gas generator by means of a casing cooled by circulation of water.

The second improvement is aimed at [the installation of] a moveable grate mounted on an axis and easily maneuverable from outside.

France 578,071

**PROCESS FOR INCREASING GAS PRODUCTION**

Ernst Goffin, Germany

*June 21, 1924; application filed in Paris Mar. 5, 1924. Gr. 15, Cl. 3*

The invention concerns:

(1) A process for increasing gas production in the horizontal or sloping degasification spaces, completely or almost completely filled with degasification material, without interference until the emptying process, and with introduction of steam above the material to be degasified, in the direction of the outlet of the gases, as early as in the first half of the degasification cycle, the said process characterized by the fact that heating is pushed to such a point and steam is brought in, in such quantities and under such conditions, that separations of the carbon are not prevented, and that the temperature prevailing in the upper space shall not be reduced below the necessary temperature for the production of water gas.

France 578,716

**IMPROVEMENTS IN THE MANUFACTURE OF FUEL GAS**

Henry Oscar Loebell, U.S.A.

*July 9, 1924; application filed in Paris Feb. 9, 1924. Gr. 15, Cl. 3*

The present invention concerns a process and an apparatus, both improved, for the manufacture of fuel gas, and the invention includes the following characteristics:

(1) The process consists of causing fuel to pass into a column through a furnace, of maintaining a high temperature zone in the median part or in the lower part of the column by blowing air through the column, of evacuating the blowing gases through a heat regenerator, of admitting air to the regenerator in order to burn the escaping gases in this regenerator, of directing water into the heated regenerator for the direct formation of steam, and of causing the steam thus formed to pass into the column of heated fuel.

France 581,613

**SYSTEM OF DISTILLER AND GASIFIER GAS GENERATOR**

Pierre Breuillé, France

*Sept. 30, 1924; application filed in Paris May 13, 1924. Gr. 15, Cl. 3*

The invention concerns a system of distillation and gasification generator performing simultaneous distillation and gasification of fuels containing a heavy proportion of water and yielding a high production of volatile materials, characterized by a special internal construction of the fixed shaft placed above the lower revolving shaft of a known type. The said special fixed shaft presents the following characteristics:

(1) Two concentric vertical sheet steel cylinders open below and having different heights; the larger one being higher than the smaller one and being placed concentrically and at a slight distance from the cylindrical wall of refractory materials constituting the fixed shaft; the annular space between these two steel cylinders forming the reservoir into which the fuel selected descends; this annular chamber being constantly connected to a fixed or rotating upper hopper serving to feed the fuel.

France 581,838

**IMPROVED PROCESS FOR THE INTRODUCTION OF A JET OF STEAM IN THE FUEL BED OF A WATER-GAS GENERATOR**

Humphreys & Glasgow, Ltd., U.S.A.

*Oct. 3, 1924; application filed in Paris May 20, 1924. Gr. 15, Cl. 3*

The invention consists of a process for the introduc-

tion of a jet of fluid, for example a jet of steam, in a diffused and expanded form and in a uniform manner throughout the surface of a water-gas generator, the said process being characterized by the fact that a rotary or rotating movement is imparted to the jet by discharging it tangentially onto and along a curved surface before it strikes the fuel bed.

France 582,823

**PROCESS AND APPARATUS FOR THE MANUFACTURE OF WATER GAS**

George Edward Whitwell, U.S.A.

*Oct. 22, 1924; application filed in Paris Apr. 25, 1924.  
Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the fabrication of water gas characterized by the fact that at certain intervals a mixture of steam and gas is caused to pass successively through the superheater, the carburetor, and the generator or an analogous apparatus.

France 583,937

**IMPROVEMENT IN APPARATUS FOR GASIFICATION IN TWO CYCLES**

Société Anonyme des Appareils de Manutention et Fours Stein, France

*Nov. 10, 1924; application filed in Paris July 22, 1924.  
Gr. 15, Cl. 3*

The invention consists of an improvement in the method of operation of gas generators in which gasification takes place in two cycles, characterized by the fact that the carbon monoxide taken from the gas produced, is burned in the gas generator during the period of blowing, which has the effect of increasing, by a determined weight of fuel, the production of gas with a low carbon monoxide content.

France 583,957

**GAS GENERATOR**

Karl Koller, Hungary

*Nov. 10, 1924; application filed in Paris July 23, 1924.  
Gr. 15, Cl. 3*

The invention consists of:

(1) The arrangement in a gas generator of a hollow distributor for the mixture of steam and air, the external edges of the outlet openings of the said distributor being vertically arranged one on top of the other.

France 584,677

**GENERATOR FOR THE PRODUCTION OF A NONILLUMINANT GENERATOR GAS STARTING FROM BITUMINOUS FUELS**

Rudolf Geipert, Germany

*Nov. 24, 1924; application filed in Paris Aug. 18, 1924.  
(Two applications filed in Germany on Aug. 18, 1923,  
Aug. 22, 1923, and Aug. 9, 1924.)  
Gr. 15, Cl. 3*

The invention consists of:

(1) A generator for the production of a nonluminous gas from bituminous fuels, in which the gases produced by the said fuels traverse a hot bed of coke or similar material, characterized by the fact that combustion air is conducted both to the bituminous fuels and to the coke, and that these two fuels are arranged in the generator in such fashion that the products cannot burn at the point of passage into the coke.

France 585,741

**IMPROVEMENTS IN APPARATUS FOR PRODUCING WATER GAS**

Thomas Francis Holden, U.S.A.

*Dec. 13, 1924; application filed in Paris Sept. 17, 1924.  
Gr. 15, Cl. 3*

This invention relates to improvements in apparatus for producing water gas, and is characterized by the following features:

(1) A generator connected to a carburetor and equipped with entrances for steam and air;

(2) A chamber arranged beside the carburetor and connected to the generator, this chamber having an outlet connected to a primary fixing chamber, such fixing taking place with the help of a horseshoe-shaped wall in the upper part of the carburetor; and to a secondary mixture chamber arranged in the body and lower part of the carburetor and filled with a checker-work of masses and spaces for regenerating the heat.

France 585,742

**PROCESS FOR THE MANUFACTURE OF WATER GAS**

Thomas Francis Holden, U.S.A.

*Dec. 13, 1924; application filed in Paris Sept. 17, 1924.  
Gr. 15, Cl. 3*

This invention relates to a process for manufacturing water gas, and includes the following characteristic features:

The manufacture of water gas in a generator by an alternating succession of blasting from below to above and from above to below, by causing the water gas to pass in a single stream into a high-temperature chamber, then subdividing this stream into several others by contact with the walls of a primary mixing chamber brought to a high temperature and making them pass into that chamber, where the water gas is enriched by means of vaporized oil, then through a refractory zone in a second mixing chamber, and finally from there through a second refractory zone into a fixing or reheating chamber.

France 586,160

**IMPROVEMENTS RELATING TO THE GASIFICATION AND DISTILLATION OF CARBONACEOUS MATERIALS**

Harold Nielsen and Bryan Loing, England

*Dec. 23, 1924; application filed in Paris Aug. 14, 1924.  
Application filed in England on Aug. 17, 1923.  
Gr. 15, Cl. 3*

The present invention concerns a process for fabricating gas starting with pulverized carbonaceous materials or such materials in a pulverized or dust state, either to reduce the ores or to treat household ordure, and the apparatus intended to apply this process, characterized by the fact that:

(1) According to the said process, there is passed through the material to be treated, with which it is brought into contact, a gaseous fluid under sufficient pressure or which has sufficient velocity to penetrate into the material or agitate the latter; this fluid, if desired, being capable of also heating the material to the required temperature for the reaction; the necessary oxygen, in the form of free air or of steam, or both at once, is introduced into the apparatus with a sufficient quantity of pulverized fuel to maintain the desired reaction temperature, this fuel entering in a completely or partially burned state in order to yield carbon dioxide, in order to obtain the temperature desired, while at the other end of the apparatus the reductive fuel, or in the case of an ore, a mixture of ore and carbonaceous materials, is introduced in a pulverized state or more or less finely divided, and is moved when it encounters the current of hot gases, in such fashion that, during coking or reduction, and while the fuel becomes less and less active, increas-

ingly higher temperatures are obtained, making it possible for the necessary reactions to take place.

France 587,277

**IMPROVEMENT IN THE OPERATION OF GAS GENERATORS**

René Bouchet, France

*Jan. 15, 1925; application filed in Paris Sept. 20, 1924.  
Gr. 15, Cl. 3*

The invention consists of an operation of gas generators characterized by the use of two fuels which act separately, the first particularly in order to achieve a high temperature for the purpose of smelting the ashes and the slag supplied by a second fuel, this second fuel completing the transformation of the oxygen in the primary air into carbon monoxide.

France 587,484

**WATER-GAS GENERATOR**

N. V. Machinerieën En Apparaten Fabrieken, Netherlands

*Jan. 19, 1925; application filed in Lyon June 11, 1924.  
Gr. 15, Cl. 3*

The present invention consists of:

(1) Boiler for a water-gas generator characterized by the fact that all the points of assembly [or jointing] of the metal sheets which are exposed to contact with the fuel, with the ashes, or with the hot gases, are made by welding the said metal sheets.

France 587,850

**IMPROVEMENTS IN THE MANUFACTURE OF CARBURETED WATER GAS**

Humphreys & Glasgow, Ltd., England

*Jan. 23, 1925; application filed in Paris, Oct. 23, 1924.  
Gr. 15, Cl. 3*

The invention is essentially characterized, in the manufacture of carbureted water gas, by the combustion, in fixing chambers, of practically all the CO contained in the blowing gases of the gas generator, until the required temperature in the fixing chambers shall have been attained; by the arresting, at this moment, of the combustion of the CO; and by the mixture of the rest of the blowing gases (the richest part) with the carbureted water gas.

France 587,896

**PROCESS FOR TOTAL GASIFICATION OF COAL**

Jackson Research Corp., U.S.A.

*Jan. 23, 1925; application filed in Paris Oct. 24, 1924.  
Gr. 15, Cl. 3*

The invention includes:

(1) A process for the total gasification of coal, consisting of introducing the coal into the upper extremity of a vertical retort, and of heating the upper part of the retort to a sufficiently high temperature to expel the volatile elements, but not so high as to bring the upper part of the load to incandescence; and consisting also of heating the lower part of the retort to a sufficiently high temperature to bring the charge to incandescence, and to send a current of gas from upward to downward through the charge, with the purpose of sweeping along the volatile elements coming from the relatively cool upper part of the charge, and of causing them to pass through the highly heated lower part of the charge.

France 588,419

**IMPROVEMENT IN ASH-FUSION GENERATOR**

Société en Nom Collectif Heurtey et Sauvageon, France

*Jan. 30, 1925; application filed in Paris Jan. 8, 1924.  
Gr. 15, Cl. 3*

The subject of the invention is a new combination of devices arranged with the purpose of their application

to an ash-fusion generator. This combination includes an annular vertical boiler forming the upper part of the gas generator, and on the external surface of the boiler, a circular chamber of masonry including, in its lower part, a series of inclined planes, forming storage hoppers where the dust is collected, this in order to recover in the apparatus itself a part of the sensible heat of the gases which are released at a high temperature and to remove from the gases the greater part of the dust which they sweep along with them.

France 590,111

**PROCESS FOR FREEING THE GRATE OF GAS GENERATORS STOPPED UP WITH SLAG**

Alfons Berger, Germany

*Mar. 11, 1925; application filed in Paris Dec. 9, 1924.  
Application filed in Germany on Mar. 31, 1924.  
Gr. 15, Cl. 3*

The invention includes:

(1) A process for freeing the grate of gas generators obstructed by slag, consisting of perforating the cupola or arch of slag by attacking it from below, or by attacking it laterally at the abutments or collapsing points.

France 590,443

**OVEN WITH SEMI-INTEGRAL DISTILLATION OF COAL FOR THE PRODUCTION OF FRENCH CONTRACTUAL GAS IN A SINGLE OPERATION**

Eugène Jeffery, France

*Mar. 18, 1925; application filed in Marseille on Dec. 12, 1924.  
Gr. 15, Cl. 3*

The invention concerns an oven for distilling coal for small gas plants, with water-gas heating by means of burners in order to obtain French contractual gas in a single operation.

[The invention is characterized by:]

(1) External heating of the retort in two stages: heating gas and blast gas;  
(2) Production of the water gas in a gas generator placed at the base of the distillation retort;  
(3) The water gas gives up its sensible heat to the coal in the distillation zone.

France 590,730

**PROCESS AND APPARATUS FOR THE GASIFICATION OF SOLID FUELS**

Louis Chavanne, France

*Mar. 25, 1925; application filed in Paris Feb. 1924.  
Gr. 15, Cl. 3*

The subject of the invention is:

(1) A process for slagging gasification of solid fuels presenting the following characteristics:  
(a) The gas generator is blown with an air-oxygen mixture.  
(b) The gas generator is blown with pure oxygen;  
(c) The oxygen-enriched air or the pure oxygen are blown at atmospheric temperature or at a higher temperature;  
(d) Preheating of the mixture of air and oxygen or of pure oxygen takes place by means of an appropriate heat source or by means of gases taken from the gas generator;  
(e) The gases taken for preheating are taken from the upper part of the gas generator or at any other point, particularly in the region of the blowing orifices.  
(f) Preheating of the mixture of air and oxygen or of pure oxygen takes place by combustion of these gases or by giving up their sensible heat, or both by combustion and giving up their sensible heat;  
(g) The preheating gases are taken immediately above the slagging zone at a point where they no longer contain condensable hydrocarbons.

(h) Means are provided to assure distillation of the fuel at a low temperature before the said fuel reaches the slagging zone;

(i) Means are provided to avoid cracking of the condensable hydrocarbons and to permit their recovery.

France 591,505

DEVICE FOR THE PRODUCTION OF MOIST AIR AND HOT AIR FOR FEEDING GAS GENERATORS

Marc-Auguste Deschaseaux, France

*Apr. 10, 1925; application filed in Paris Jan. 9, 1925.  
Gr. 15, Cl. 3*

The present invention concerns a device for the production of moist air and hot air for feeding gas generators, characterized particularly by:

(1) An atomizer, emptying into a throttled part of the air-inlet pipe and fed by water coming from a vessel with a constant level, which permits the production of cold air containing a determined proportion of water either in a state of vapor or in a state of fine droplets in suspension.

(2) An exchanger following on the foregoing device, which uses for reheating the mixture of air and water, previously obtained, the heat of the gases emerging from the gas generator.

France 593,209

IMPROVEMENTS IN GAS GENERATORS

August Winkler, France

*May 16, 1925; application filed in Paris Feb. 11, 1925.  
Gr. 15, Cl. 3*

The invention concerns improvements in gas generators characterized by:

(1) Laterally perforated pipes or auxiliary hearths, with any type of injectors which may, for example, be of the Wilton type described in French Patent 530,934 of February 11, 1921 and its supplements, are arranged on the walls of gas generators at a variable height above the grate or main hearth, in order to avoid the formation of arches and agglomerations of slag inside the gas generators and to improve their production.

France 593,620

PROCESS FOR THE PRODUCTION OF AN OIL GAS ANALOGOUS TO WATER GAS, BUT WITH A VERY HIGH CALORIFIC VALUE

Otto Misch, Germany

*May 30, 1925; application filed in Paris Jan. 7, 1925.  
Application filed in Germany on Aug. 6, 1924.  
Gr. 15, Cl. 3*

The invention consists of a process for the production of an oil gas, analogous to water gas, but of a very high calorific value, characterized by the fact that:

(1) The gas containing the water gas, produced in the gas generator, is heated, before its passage into a distillation retort and by a regulatable heating device to the temperature necessary for obtaining the desired calorific value.

France 594,734

IMPROVEMENTS IN GAS GENERATORS

Jacques-Gustave Schulz and Henri-Jean-Marie Lorient, France  
*June 30, 1925; application filed in Paris June 5, 1924.  
Gr. 15, Cl. 3*

The invention extends specially to the following characteristics and their various combinations:

(1) A gas generator characterized by an ashpit the bottom of which is moveable, the said bottom being such that it can be kept separated at an appropriate distance from the seating of the gas generator for firing or for emptying the water from the ashpit, either strongly applied against the said seating during nor-

mal operation, or finally, completely removed in the case of emptying and cleaning of the gas generator.

France 595,418

IMPROVEMENTS IN WATER-GAS GENERATORS

Humphreys & Glasgow, Ltd., England

*July 16, 1925; application filed in Paris Feb. 2, 1925.  
Application filed in England June 18, 1924.  
Gr. 15, Cl. 3*

The present invention concerns a water-gas generator with automatic poking and automatic production of steam, particularly characterized by:

(1) A steam boiler including an annular water chamber surrounding a part of the fuel bed, the position, the cross section, and the interior wall thereof being adapted to the operations of air blowing and steam injection, as well as to the nature of the fuel, in such fashion that the slag and the ashes can be continuously evacuated from the gas generator by mechanical means, yet at the same time, without removing from the fuel bed any more [heat] value than that required for producing the steam required for the gas generator.

France 595,513

IMPROVED ROTATING GRATE FOR GAS GENERATOR

Société Anonyme des Usines Lambot, Belgium

*July 18, 1925; application filed in Paris Mar. 20, 1925.  
Application filed in Germany July 29, 1924.  
Gr. 15, Cl. 3*

The invention concerns a rotating grate for gas generators or other furnaces and including a cylindrical portion surmounted by a flattened cone, on the surface of which teeth are provided having a gently sloping part connected by a ridge to a steeply sloping part, the said grate being characterized by the shape of the ridges which extend from the periphery to the center, following an appropriate curve.

France 595,671

IMPROVEMENTS IN GAS GENERATORS

Jacques-Gustave Schulz and Henri-Jean-Marie Lorient, France  
*July 24, 1925; application filed in Paris June 20, 1924.  
Gr. 15, Cl. 3*

The invention applies especially to the following characteristics and their various combinations:

(1) A gas generator in conformity with Patent 586,606 and characterized by the fact that one of the extremities of the body of the gas generator is flanged on a horizontal plane, this flanged extremity being engaged in a groove arranged in the element adjacent to the gas generator, such as the base part or the top part, and clamping there a ring of plastic material.

France 595,957

IMPROVEMENTS IN THE MANUFACTURE OF WATER GAS

Humphreys & Glasgow, Ltd., England

*July 27, 1925; application filed in Paris Mar. 31, 1925.  
Application filed in the U.S.A. on Apr. 3, 1924.  
Gr. 15, Cl. 3*

The invention consists of a process for manufacturing water gas including the following characteristics:

(1) The process consists of establishing and maintaining a fuel bed contained in one or several gas generators located between two recuperators; of blowing hot air and of making an injection of superheated steam, dividing them into two currents, one toward the top of the fuel bed and the other toward the part located above the base of that bed, and without dividing them for the intermediate part of the fuel bed; and of causing them to pass through the two recuperators, of storing the heat of the secondary combustion and the sensible heat of the water gas in one of these



recuperators, at the same time heating the air and the steam by means of the heat stored in the other recuperator; and of evacuating the relatively cold gas and the relatively cold combustion products, independently, through each of these recuperators.

France 596,312

#### GAS GENERATOR WITH PREVIOUS CARBONIZATION

Francisque-Paul Roussel, France

*Aug. 8, 1925; application filed in Lyon on Apr. 6, 1925.  
Gr. 15, Cl. 3*

The gas generator with previous carbonization which is the subject of the present invention includes the following essential parts:

(1) A coal distributor making it possible to introduce into the apparatus well determined quantities of fuel;

(2) A distillation retort wherein the coal is carbonized by the sensible heat of the producer gas produced by the semicoke which is residual, without, however, lessening the calorific value of the distilled gas emerging from the retort;

(3) A gas generator shaft wherein the semicoke is gasified;

(4) A recovery apparatus transmitting the calories of the producer gas to the heat vehicle, the task of which is to bring them in contact with the coal to be distilled.

France 597,096

#### PROCESS AND APPARATUS FOR THE GASIFICATION OF SOLID FUELS

Louis Chavanne, France

*Aug. 21, 1925; application filed in Paris July 29, 1924.  
Gr. 15, Cl. 3*

Process for the gasification of fuels characterized by the application independently or simultaneously of the following methods:

(1) Differentiated charging of fuels in order to obtain integral combustion of all the fuel, this method of charging consisting of introducing, respectively: the pieces by the charging hole and the smalls and the fines, in part by the charging hole after having caused them to undergo an agglomeration or briquetting process beforehand; and the remaining part of the fines, by the appropriate device placed in the region of the blast orifices. In an ancillary fashion, the charging by the same process, mixed or not mixed with the fuel, metal compounds or compounds of metalloids.

France 604,658

#### APPARATUS AND PROCESS FOR THE MANUFACTURE OF FUEL GAS

Ira Clifton Copley, U.S.A.

*Jan. 30, 1926; application filed in Paris Sept. 16, 1925.  
Gr. 15, Cl. 3*

The present invention concerns a process for the manufacture of fuel gas starting with a lighted fuel, this process being characterized by the fact that . . . there is uniform distribution of the porosity of the mass of the fuel by coordinating the air from the transverse section of this body of fuel and its delimitation surfaces in such fashion as to prevent the formation of inactive masses in the descent to the incandescent zone.

France 604,810

#### PROCESS FOR THE DRY COOLING OF COKE AND ITS APPLICATION TO A CONTINUOUS GAS GENERATOR OVEN

Bamag-Meguain A. G., Germany

*Feb. 1, 1926; application filed in Paris Oct. 16, 1925.  
Gr. 15, Cl. 3*

The present invention concerns a process for dry cooling of coke with the aid of a cooling agent in a

gaseous or vapor state, in circulation above a heat-exchanging device, this process being characterized by the fact that the cooling agent emerging in a hot state from the coke reservoir is brought into contact with a water spray to be cooled, and [the cooling agent] is thus enriched with steam; this process being also characterized by the fact that . . . a circulation of the cooling agent, accompanied by a continuous bringing in of hot coke and a continuous removal of cold coke, takes place only in the cold part of the column of coke to be cooled, a fact which constantly gives rise to steam which, in a measure proportionate to its formation, is conducted in countercurrent through the hotter column of coke and thus used to produce water gas.

France 605,731

#### IMPROVEMENTS BROUGHT ABOUT IN THE PROCESSES OF CARBONIZATION OR GASIFICATION OF FUELS

International Combustion Engineering Corp., U.S.A.

*Feb. 22, 1926; application filed in Paris Nov. 5, 1925.  
Application filed in the U.S.A. Nov. 6, 1924.  
Gr. 15, Cl. 3*

The present invention concerns improvements in the processes of carbonization or gasification of pulverized fuels, processes of the type of those in which these fuels are obliged to descend into an atmosphere of hot gases which are ascending.

The said improvements are essentially characterized by the fact that:

(1) Below or in the lower part of the carbonization zone, the fuel which descends is burned upon contact with a limited quantity of oxidizing gases, in such fashion that the fuel is transformed almost completely into fuel gases.

France 606,268

#### IMPROVEMENTS IN THE MANUFACTURE OF WATER GAS

Arthur Graham Glasgow, U.S.A.

*Mar. 6, 1926; application filed in Paris Mar. 3, 1925.  
Application filed in England March 13, 1924.  
Gr. 15, Cl. 3*

The present invention concerns a process for the manufacture of water gas including the following characteristics:

(a) The steam is superheated by causing it to pass in a direction inverse to the direction of natural circulation of the gases through the usual recovery chamber or chambers, and the superheated steam is used for the period of "manufacture" in the ascending direction and the gases produced in the gas generator are conducted away without causing them to pass through that chamber or those chambers.

France 606,334

#### IMPROVEMENTS IN THE PRODUCTION OF FUEL GAS

Herbert Alfred Humphrey and Synthetic Ammonia & Nitrates, Ltd., England

*Mar. 8, 1926; application filed in Paris Sept. 23, 1925.  
Application filed in England on Sept. 24, 1924.  
Gr. 15, Cl. 3*

The subject of the present invention is:

(1) A process for the production of a fuel gas by means of a pulverized fuel, characterized by the fact that a pulverized fuel is caused to react on steam and on oxygen, both highly heated beforehand to a very high temperature, in such fashion that conditions be favorable to the production of carbon monoxide and unfavorable to the existence of carbonic acid and hydrocarbons, the said temperature being kept high essentially by the fact that an abnormally large percentage of the available heat from the hot gaseous products is sent to the combustion chamber in the form of a previous heating of the entering gases, in such fashion that these gases are heated at a temperature exceeding 900° C.

France 608,277

**SMALL GAS GENERATOR WITH INTERIOR EVAPORATOR**

Motorenfabrik Deutz A. G., Germany

*Apr. 19, 1926; application filed in Paris Dec. 21, 1925.**Application filed in Germany Dec. 22, 1924.**Gr. 17, Cl. 3*

The invention concerns a small gas generator including an evaporator mounted at the lower part of the shaft, the said gas generator being characterized by the fact that the evaporator is constituted by a reservoir with a water level kept substantially constant, and above which passes the air led to the gas generator.

The evaporation reservoir can be equipped with one or several overflow pipes made integral with in.

France 609,340

**PROCESS FOR THE MANUFACTURE OF WATER GAS**

La Combustion Rationnelle, France

*May 10, 1926; application filed in Paris Apr. 23, 1925.**Gr. 15, Cl. 3*

Process for the obtaining of water gas by continuous operation, characterized by the decomposition of the steam by means of any type of pulverized fuel, which is brought to a high temperature by the blowing of air rich in oxygen or pure oxygen, this type of fuel and the method of heating assuring, in a permanent fashion, the necessary temperature elevation for the decomposing of the steam, without any period of cooling which requires an arresting in the injection of steam.

France 606,364

**IMPROVEMENTS IN THE MANUFACTURE OF WATER GAS**

Humphreys &amp; Glasgow, Ltd., England

*Mar. 8, 1926; application filed in Paris Oct. 13, 1925.**Application filed in the U.S.A. Oct. 31, 1924.**Gr. 15, Cl. 3*

The present invention concerns improvements in the manufacture of water gas and includes the following characteristics:

(1) A part of the total amount of blue water gas is engendered by injecting steam at a low temperature on the fuel bed of the gas generator in a direction opposite to the air-blowing current, and the blue water gas thus obtained is removed from the group of apparatus directly upon its emergence from the fuel bed.

France 609,380

**GAS GENERATOR**

Henri Dupuy, France

*May 10, 1926; application filed in Paris Jan. 15, 1926.**Gr. 15, Cl. 3*

The invention consists of a gas generator presenting the following characteristics:

(1) The feed fuel is measured out by an adjustable distributor, ignited in an air current of a determined flow according to its ratio to the flow of the fuel, and the flame produced is directed by that same air current onto a mass of reductive coal of a constant thickness.

France 609,652

**PROCESS FOR THE PRODUCTION OF GAS**

Ernest Salisbury Suffern, U.S.A.

*May 17, 1926; application filed in Paris Jan. 11, 1926.**Application filed in England Jan. 12, 1925.**Gr. 17, Cl. 3*

The invention concerns a process for the production of gas, consisting of projecting fuel and air into a combustion chamber in such quantity that the volume of gas produced and its motion suffice to assure the impossibility of a deposit of particles under the action

of gravity in the combustion chamber, and to maintain the fuel and the air in the course of combustion animated by a cyclone motion with a retrograde tendency, which is obtained by causing the current of air or of gas and a part or all the particles which have not reacted, or which reacted only partially, to enter in contact with one or several internal surfaces of the combustion chamber; this process being further characterizable by the fact that . . . the fuel and the air are brought into contact with one or several surfaces in such fashion that the elements, the products, and the residue of the combustion receive a vortex motion which suffices to prevent a deposit of material on the walls or surfaces of the combustion chamber.

France 609,657

**PROCESS FOR THE PRODUCTION OF GAS**

Ernest Salisbury Suffern, U.S.A.

*May 17, 1926; application filed in Paris Jan. 12, 1926.**Application filed in England Jan. 23, 1925.**Gr. 15, Cl. 3*

The invention consists of a process for producing gas, this process consisting of mixing fuel with air, of introducing the mixture in a continuous fashion into a gas generator having a heated zone the temperature of which is such that it determines the reaction of the fuel, the movement of the mixture in course of combustion through the gas generator, and the return of the said mixture toward the point of admission where the mixture admitted is thus thermically influenced; this process being, moreover, characterizable by the fact that:

(a) The fuel is mixed with air in a zone the temperature of which is below 600° C. and its reaction is effected during the time that the mixture penetrates into a combustion chamber by removing itself through one or several entrance orifices in order to approach an opposite surface which sends back the mixture in the course of combustion and obliges it to mix partially with the entering mixture or to influence it thermically.

France 609,814

**PROCESS FOR THE INTEGRAL DISTILLATION AND GASIFICATION OF SOLID FUELS AND APPARATUS FOR CARRYING OUT THE PROCESS**

Pierre-Eugène-Henri Forsans, France

*May 18, 1926; application filed in Paris May 2, 1925.**Gr. 15, Cl. 3*

The subject of the present invention is:

(I) A distillation process and a process for the integral gasification of solid fuels, coals, lignites, schists, wood, etc., in all their forms, characterized by:

(1) The simultaneous production,

(a) Of distillation oil gas, evacuated from the oven as is or after having been carbureted by repassage, pure or in mixture with other injected gases or steams, into the zones of the fuel being under treatment which are hotter than its point of formation; this auto-carburation of the oil gas being completed following the need, by an additional injection of hydrocarbons (tars, oils, benzols, etc.) which are decomposed into gas, adding themselves to the distillation gas, and are evacuated with the latter.

(b) Producer gases issued from the regeneration of the fumes originating from the heating flames, or issued from an injection of water, of steam or of other gases, or issued from the combination of these three means together, or two by two; these producer gases being drawn away from contact with the fuel at a point or at points with a temperature such that there is the least possible decomposition of the CO formed into CO<sub>2</sub>; these producer gases being also . . . enriched, according to need, by an additional injection of hydrocarbons (tars, oils, benzols, etc.), which are decom-

posed into gas adding itself to the producer gases formed.

(c) The separate collecting of the oil gas, the carbureted oil gas and the carbureted producer gas (or noncarbureted), or the collecting in mixture, together or two by two, of these various gases manufactured in separate zones of the oven, and evacuated, either at the head of the oven, or at one or several intermediate points distributed at the upper part of the oven.

France 614,310

**IMPROVEMENTS IN GAS GENERATORS OR GASOGENES  
EQUIPPED FOR MECHANICAL POKING**

Humphreys & Glasgow, Ltd., and Arthur Graham Glasgow,  
U.S.A.

*Sept. 14, 1926; application filed in Paris Apr. 9, 1926.  
Application filed in England on May 6, 1925.*

*Gr. 15, Cl. 3*

The present invention concerns gas generators for the production of water gas, producer gas, etc., which are provided with rotating grate devices intended to effect the mechanical poking of the fuel beds, and the invention concerns more particularly gas generators which have grate devices with a hydraulic guard.

France 615,253

**PROCESS AND DEVICE FOR THE PRODUCTION OF CAR-  
BURETED WATER GAS**

Frankfurter Gasgesellschaft and Ernst Schumacher and Franz  
P. Tillmetz, Germany

*Oct. 4, 1926; application filed in Paris Apr. 28, 1926.*

*Gr. 15, Cl. 3*

The invention consists of a process for the production of carbureted water gas characterized by the fact that the mixture of oil vapor, superheated, if necessary, is led directly to the fuel, and, in fact, into a zone which has a temperature of approximately 700° to 900° C.; and by a variation of the process in accordance with which a continuously operating gas generator is used.

France 615,353

**GAS GENERATOR**

Georges Imbert, France

*Oct. 9, 1926; application filed in Strasbourg on Sept. 25,  
1925.*

*Gr. 15, Cl. 3*

The invention concerns:

A gas generator of metal without refractory lining, characterized by the fact that its metal walls exposed to a high temperature are surrounded by a metal casing in such fashion as to permit the existence of an annular channel in which the generator gases or other reductive gases with or without reaction are introduced.

France 616,540

**ROTATING GRATE FOR GAS GENERATORS**

René Heurtey, France

*Oct. 29, 1926; application filed in Paris Oct. 15, 1925.*

*Gr. 15, Cl. 3*

The invention concerns a rotating grate device for gas generators presenting the following characteristics:

(1) The grate is composed of a series of superimposed segments of a polygonal shape, preferably square, with markedly rounded corners, for the purpose of assuring the sweeping along and progressive crushing of the slag.

(2) The air-outlet orifices between the segments are completely covered and open to the air in a reverse direction from top to bottom, which prevents obstruction and assures a regular distribution of air in the mass of slag; this characteristic being, moreover, independent of the polygonal shape and being susceptible

of application as well to segments of a round and oval shape, eccentric or not.

France 616,985

**GAS GENERATOR PRODUCING CARBURETED WATER GAS**  
Frankfurter Gesellschaft and Franz P. Tillmetz and Ernst  
Schumacher, Germany

*Nov. 8, 1926; application filed in Paris June 1, 1926.*

*Gr. 15, Cl. 3*

The present invention consists of a gas generator producing carbureted water gas with introduction of a mixture of steam and oil vapor characterized by the fact that the lower part of the shaft works in the manner of an ordinary gas generator, whereas the upper part is employed for cracking of the mixture of steam and oil vapor introduced at the junction of the two parts of the shaft, the upper part being maintained at a lower temperature.

France 618,552

**GAS GENERATOR FOR THE CONTINUOUS MANUFACTURE  
OF "BLUE" WATER GAS**

Maurice-Henri Hereng, France

*Dec. 16, 1926; application filed Nov. 12, 1925 in Paris.*

*Gr. 15, Cl. 3*

The invention consists of a device for the generating of water gas in accordance with a continuous method, composed essentially of a mechanical grate enclosed in a tunnel. This grate transports the fuel in a continuous manner above gastight fireboxes in which are performed the ignition of the fuel and the gasification.

In the same way, charging of the coal and emptying of the ashes, as well as complete combustion of the combustible elements which they might still contain, are simultaneously operated.

The flow of the gas is continuous and the speed of the grate regulates the flow.

France 619,024

**PROCESS FOR EXTRACTING FROM BITUMINOUS FUELS,  
BY MEANS OF A GENERATOR, A GAS THE CALORIFIC  
VALUE OF WHICH SHALL BE FROM 3,500 TO 4,500  
CALORIES PER CUBIC METER**

Otto Misch, Germany

*Dec. 3, 1926; application filed in Paris July 16, 1926.  
Two applications filed in Germany on July 16 and  
20, 1925.*

*Gr. 15, Cl. 3*

The invention consists of a process for the manufacture of gas having a calorific value of 3500 to 4500 calories per cubic meter, drawn from bituminous fuels by means of a generator on top of which is placed a vertical retort for the degasification of the fuel, a process characterized by the fact that the retort for distillation is heated, by means of water gas, originating from the water-gas generator located below and by using burners, to a temperature in the neighborhood of that which prevails in retorts for illuminating gas, in such fashion that the vapors which are released by carbonization are decomposed, within the most extensive limits, into illuminating gas, while the fuel deprived of gas does not yet agglomerate into pieces of excessive size.

France 624,739

**PROCESS FOR THE PRODUCTION OF A MIXED GAS WITH  
3,500 TO 4,500 CALORIES PER CUBIC METER, BY MEANS  
OF ILLUMINATING GAS, WATER GAS AND OIL GAS**

Dellwik-Fleischer Wassergas G.m.b.H., Germany

*Apr. 11, 1927; application filed in Paris Nov. 17, 1926.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the production of a mixed gas of

3,500 to 4,500 calories per cubic meter, by means of illuminating gas, water gas, and oil gas, by the gasification of a bituminous fuel and oil or tar in a water-gas generator in front of which a vertical retort has been assembled for the previous treatment of the bituminous fuel, characterized by the fact that the lower extremity of the retort is brought, by means of water gas and compressed-air burners, to a working temperature of approximately that prevailing in illuminating-gas retorts, in such fashion that the fuel introduced into the water-gas generator located below shall be completely free of bitumen and tar and shall also possess sufficient mechanical resistance to be able to be transformed without difficulties into water gas in the water-gas generators located below.

France 625,079

PROCESS AND GAS GENERATOR FOR OBTAINING A GASEOUS MIXTURE FREE OF TAR

Janos von Jaszovszky, Hungary

*Apr. 19, 1927; application filed in Paris Nov. 24, 1926.  
Gr. 15, Cl. 3*

The invention includes:

(1) A process for the manufacture of a gaseous mixture constituted by illuminating gas free of tar and by water gas manufactured in a continuous manner, the characteristic of this process being that, in two "degasification" chambers of the upper floor of a gas generator, the coal is charged alternately; that this coal is rendered incandescent by the external heating of the walls of the gas generator; and that the illuminating gas engendered in one of the chambers is exhausted through the incandescent coke contained in the other chamber, steam being introduced at the same time in the lower floor of the gas generator, which forms a degasification space, and the water gas produced being exhausted so as to be, in part, mixed with the illuminating gas engendered in the chamber, and, in part, burned with additional air, in such fashion that the combustion products heat continually, from the outside, the walls of the gasification and degasification spaces throughout the entire height of the gas generator, which assures continuity in the gasification and manufacturing of the water gas.

France 625,258

IMPROVEMENTS IN GAS GENERATORS

Charles Woodward Andrews and William Brewster Chapman, U.S.A.

*Apr. 19, 1927; application filed in Paris Nov. 29, 1926.  
Gr. 15, Cl. 3*

The invention concerns a gas generator, the lateral wall of which is extended downward as far as the lower level of the ash bed in order to completely obstruct the direct lateral evacuation, toward the outside, of the ashes outside the said ash bed, this generator including an opening for evacuation of the ashes directed downward inside the lateral wall and below the ash bed; an agitating medium in the ash bed in order to move upward, in a substantial quantity, large successive parts of the ash and fuel beds and then permit these beds to return approximately to their previous levels; a means for maintaining a certain mass of ashes in the passage which the latter follow when they are being evacuated through the said opening; and an adjustable means of removing layers of ashes from this mass of ashes, in order to permit the ashes to be withdrawn from the ash-bed at determined speeds.

France 625,526

IMPROVEMENTS IN THE MANUFACTURE OF GAS

Humphreys & Glasgow, Ltd., and Mr. James Caldwell Stelfox, England

*Apr. 25, 1927; application filed in Paris Dec. 1, 1926.  
Application filed in England Jan. 20, 1926.  
Gr. 15, Cl. 3*

The present invention concerns the manufacture of gas by carbonization of coal in the upper part of a gas generator and using the coke thus produced for the production in the lower part of a gas generator of water gas; and the invention includes the following characteristics:

(1) The coke is removed only from the outer-edge part of the fuel shaft, at the base or near the base of the carbonization chamber, this coke being removed uniformly or almost uniformly all around the entire part of the outer edge of the shaft.

France 625,643

PROCESS FOR THE MANUFACTURE OF A GAS

Harald Nielsen, England

*Apr. 25, 1927; application filed in Paris Dec. 3, 1926.  
Gr. 15, Cl. 3*

The present invention concerns the manufacture of a gas for lighting purposes or for industrial applications, characterized by the reduction to carbon monoxide, of carbonic acid in the presence of semicoke, the carbon monoxide being recoverable at the time of the distillation of products with a carbon content at a temperature below 800° C.; characterized by the heating of a heat accumulator at that reaction temperature then by the introduction of semicoke into the chamber, and by the sending of a current of gas or of carbonic acid through the latter, this gas being heated and reduced into carbon monoxide by the semicoke; and a device for the execution of the said process, either by a furnace, or by the means of a retort installed in a rotating drum.

France 625,648

DEVICE FOR THE THERMIC TREATMENT OF PULVERIZED MATERIALS OR FINELY GRANULATED MATERIALS

Joseph Trautmann, Germany

*Apr. 25, 1927; application filed in Paris Dec. 3, 1926.  
Application filed in Germany Dec. 8, 1925.  
Gr. 15, Cl. 3*

Device for the thermic treatment of pulverized or finely divided materials, in particular for drying, distillation, gasification, or hydrogenation of the coal, the material being kept in suspension in chambers filled with gas; the said device characterized by the fact that the chamber for treating the material is composed of two or more shafts or other analogous concentric or juxtaposed devices, through which a mixture of the material to be treated, and with hot gas, is caused to be passed, by aspiration or by forced draft.

This device can be also characterized by . . . the recipients serving for the treatment of the material, as well as the organs for introducing the hot gas and the dust, being set up to operate under pressure higher than ordinary pressure.

France 625,732

PROCESS FOR THE PRODUCTION OF GENERATOR GASES AND OTHERS WITH PULVERIZED FUELS, AND APPARATUS FOR CARRYING OUT THE SAID PROCESS

Friedrick Bigot, Tunisia

*Apr. 30, 1927; application filed in Paris Dec. 6, 1926.  
Gr. 15, Cl. 3*

The invention consists of a process for the production of generator gases characterized by the fact that the pulverized fuel is considered as a combustible gas

current which is then made to pass with air and steam through a porous mass or wall acting as a catalyzer in the production of fuel gases.

The apparatus for carrying out the process above described is characterized by its use as a direct burner (total combustion) or as a producer of generator gas (partial combustion) and composing a porous wall made up of solid fragments put into movement by a mechanical process.

Application of the aforementioned apparatus in combination with known auxiliary devices is, either for industrial heating, or for the production of motive force with a fixed station or at the side of automotive vehicles, etc.

France 626,007

**PROCESS AND DEVICE FOR THE PRODUCTION OF A MIXED GAS COMPOSED OF ILLUMINATING GAS, OF OIL GAS AND OF WATER GAS**

Otto Misch, Germany

*May 2, 1927; application filed in Paris Nov. 29, 1926.  
Gr. 15, Cl. 3*

The invention consists of a process for the manufacture of a mixed gas composed of illuminating gas, oil gas, and water gas, characterized by the fact that:

(1) The bituminous fuel, moving in a vertical distillation retort, humidified by oil or tar, freed of all gasifiable and evaporatable constituents by the heating of the retort starting from outside, and being in a state of incandescence in an intermediary region, is extinguished by an uninterrupted introduction of steam thus producing water gas which is mixed to the illuminating gas and to the oil gas engendered in the distillation retort to such a point that it can still be transformed in a producer-gas generator located at the lower part, into an ordinary generator gas which ignites when mixed with air compressed by the heating of the retort and if necessary is again withdrawn in part in order to be used to feed motors.

France 627,025

**COMPOUND GAS GENERATOR**

Eugène Wibratte, France

*May 28, 1927; application filed in Lille, Dec. 31, 1926.  
Gr. 15, Cl. 3*

The "Eugène Wibratte" compound gas generator, which is the principal subject of the present invention, consists of a heating apparatus for appropriate fluids at the same time that it produces generator gas. This apparatus is characterized by a special type of shaft formed by vertical hollow elements, or sloping hollow elements, placed one beside the other, of different shapes, and the purpose of which is to heat the fluid which traverses the elements (or even to vaporize it under low or high pressure) at the same time that the gas, coming from the treatment of the raw materials for feeding the gas generator, is manufactured inside the shaft formed by these elements.

France 627,757

**IMPROVEMENTS IN APPARATUS FOR THE CARBURETION OF WATER GAS**

Humphreys & Glasgow, Ltd., England

*June 14, 1927; application filed in Paris Jan. 19, 1927.  
Application filed in the U.S.A. Mar. 1, 1926.  
Gr. 15, Cl. 3*

The present invention consists of an apparatus for carbureting water-gas, arranged so as to be heated by the combustion of blowing gas in the apparatus, and including the following characteristics:

(1) The recipient vessel, of a generally cylindrical shape, is provided with a column mounted inside this recipient vessel and terminating a little before its top; an oil atomization device is mounted at the top of the

receiving vessel and is arranged for atomizing the oil practically outside the top of the shaft in order to conserve a hot point on the said top; and pipes for admitting air and blowing gas are located near the top of the chamber near the hot point.

(2) The column is hollow and possesses a pipe emptying at the lower part of its chambering, and pipes traversing the upper part of its wall.

France 628,175

**IMPROVEMENTS IN THE MANUFACTURE OF WATER GAS**

Humphreys & Glasgow, Ltd., England

*June 21, 1927; application filed in Paris Jan. 28, 1927.  
Application filed in England June 4, 1926.  
Gr. 15, Cl. 3*

The invention consists of [improvements whereby] in a water-gas generator, a body or core, which is suspended from above, occupies the central upper part of the generator and maintains the fuel to be carbonized in an uninterrupted mass of an annular or other shape.

France 628,695

**PROCESS AND APPARATUS FOR THE MANUFACTURE OF PRODUCER GAS AND WATER GAS**

Société de Constructions d'Appareils pour Gaz à l'Eau et Gaz Industriels, France

*July 4, 1927; application filed in Paris Feb. 8, 1927.  
Gr. 15, Cl. 3*

The present invention consists of:

(1) A method for the manufacture of producer gas and water gas in gas generators or industrial generators, consisting of injecting simultaneously into these apparatus steam and oxygen in such proportions that the heat released by the reaction  $C + O_2 = CO$  compensates for the absorption of heat by the reaction  $C + H_2O = CO + H_2$ , which makes it possible to eliminate the ordinary periods of air blowing and render manufacturing [of water gas] continuous.

France 630,330

**PROCESS FOR THE PREPARATION OF HYDROGEN BY MEANS OF STEAM AND CARBON**

Société Internationale des Combustibles Liquides, Grand Duchy of Luxembourg

*Aug. 20, 1927; application filed in Paris Mar. 5, 1927.  
Application filed in Germany Dec. 3, 1926 in the name of the Société Deutsche Bergin-Aktiengesellschaft für Kohle-und Erdölchemie.  
Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the preparation of water gas by means of steam and carbon, characterized by the fact that materials rich in carbon obtained by the pyrogenation of organic materials at a low temperature, such as, for example, coke enter into a reaction with steam at temperatures of 500° to 800° C. for example.

France 631,067

**UTILIZATION OF FUELS IN A PASTY STATE IN ALL THEIR APPLICATIONS AND PRINCIPALLY IN GAS GENERATORS**

Jules-Maurice-Bernard Rémond, France

*Sept. 3, 1927; application filed in Lyon June 14, 1926.  
Gr. 15, Cl. 1*

The invention consists of:

(1) The utilization of fuels in a pasty state in all their applications and principally in gas generators, thus making it possible to achieve continuous feeding and immediate combustion and to produce a flow of gas proportional to the speed of entrance of the combustible material used either alone, or incorporated with another fuel, such as molasses, fuel oil, etc.

France 631,948

## PROCESS FOR THE PRODUCTION OF GAS

I. G. Farbenindustrie, A.G., Germany

*Sept. 24, 1927; application filed in Paris Apr. 1, 1927.**Applications for two patents filed in Germany Apr. 27, 1926, and Jan. 24, 1927.**Gr. 15, Cl. 3*

The invention consists principally of:

(1) A method of executing the process for the production of water gas or producer gas by the expenditure of granular fuels in a vertical oven, in which the gasification agents are injected in such fashion that the fine-grain fuel shall be constantly kept in motion of a rotating, up-and-down nature, the said method of execution being characterized by the use of a grate, possibly constructed as a moveable grate, consisting of two rows of bars, preferably reinforced, arranged in such fashion that the empty spaces in the shape of slots of the lower row of bars shall be covered by the bars, preferably in the shape of hanging roofs, of the upper row in such fashion that neither, the coal in motion on the grate nor the ashes, can fall between the bars.

France 632,466

## PROCESSES FOR THE PRODUCTION OF FUEL GASES BY THE USE OF GRANULAR FUELS

I. G. Farbenindustrie, A.G., Germany

*Oct. 10, 1927; application filed in Paris Apr. 8, 1927.**Two applications filed in Germany Apr. 19 and Nov. 6, 1926.**Gr. 15, Cl. 3*

The subject of the invention is:

(1) A process for the production of fuel gases by gasification of solid granular fuels, accompanied or not by dust, consisting of keeping them, with the gasifying agents, in a motion of progression during the gasification process.

(2) A method of execution consisting of sweeping the fuels along by the gasifying agents animated by a sufficient rate of speed.

(3) Another method of execution consisting of sweeping the fuels along first by air for the purpose of transforming mainly the finest particles into producer gas, then of transforming the incandescent granular residue by the action of the steam in the same manner or in any other manner appropriate, into water gas.

France 632,826

## PROCESS FOR THE PRODUCTION OF GAS HAVING A CALORIFIC VALUE OF 3,500 TO 4,500 CALORIES PER CUBIC METER BY MEANS OF BITUMINOUS FUELS WITH THE AID OF A GAS GENERATOR

Otto Misch, Germany

*Oct. 17, 1927; application filed in Paris Apr. 15, 1927.**Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the production of gas possessing a calorific value of 3,500 to 4,500 calories per cubic meter, extracted from bituminous fuel, by means of a gas generator in front of which is placed a retort serving for the distillation or degasification of the fuel, the said process being characterized by the fact that the said retort is heated from outside, at its lower extremity, by means of an intensive furnace with a flame with a high temperature, in such fashion that the contents of the retort, which is at the base of the latter, shall be brought to a temperature higher than 700° C., while the temperature of the contents of the retort, by going toward the charging end of the latter, is reduced to about 250° C.

France 633,470

## IMPROVEMENTS MADE IN THE PROCESSES AND APPARATUS FOR PRODUCING GAS

Rudolf Lederer, Austria

*Oct. 24, 1927; application filed in Paris Apr. 27, 1927.**Application filed in Austria Apr. 28, 1926.**Gr. 15, Cl. 3*

The purpose of the invention is certain improvements made in the processes and apparatus for the production of gas, particularly of a mixture of water gas and distillation gas, from coke, being obtained as a secondary product in a chamber or shaft separate from the gas generator, the said improvements consisting mainly:

Of conducting the gases from the gas generator (blowing gas), produced during the period of heating of the gas generator by blowing, either directly, or after partial combustion, through a zone of previously distilled (coke) bituminous fuel, into the separate coke chamber above mentioned, in order to harden the coke.

France 634,365

## DOUBLE-HEARTH GAS GENERATOR

René Marion, France

*Nov. 18, 1927; application filed in Paris May 13, 1927.**Gr. 15, Cl. 3*

The present invention consists of:

(1) A gas generator device, the particular feature of which consists in the establishment, inside the said gas generator, of a double hearth including a central part for direct extraction [of the gas] and in the axis and at the base of which combustion air is admitted, and a peripheral part, with reversed draft, from whence the gases formed are passed to the dust collector, and from thence to the motor.

France 634,396

## GAS GENERATOR

Robert-Marie-Albert-Ernest Cézanne, France

*Nov. 18, 1927; application filed in Paris Aug. 13, 1926.**Gr. 15, Cl. 3*

The invention consists of a gas generator with reverse combustion, characterized principally by the fact that the gases extracted from the hearth pass by means of canals arranged in a refractory lining surrounding the said hearth.

France 634,855

## DEVICE FOR DISCHARGING FOR GASIFICATION CHAMBER OR DISTILLATION CHAMBER WHICH ARE EITHER HORIZONTAL OR SLOPING

C. Eitle, Maschinenfabrik, Germany

*Dec. 9, 1927; application filed in Paris May 23, 1927.**Application filed in Germany July 6, 1926.**Gr. 15, Cl. 3*

The invention consists of a device for discharging for horizontal or sloping gasification or distillation chambers, including the following characteristics:

(1) The pushing device or ejector is hollow and forms the mouthpiece of the charging device (for example, of the centrifugal device).

(2) The pushing device is composed of several parts which telescope one into the other.

(3) This pushing device is mounted in such fashion as to be able to oscillate.

(4) The suspension frame which carries the pushing device and the charging device can turn around a vertical axis.

France 635,663

## SPECIAL CONSTRUCTION FOR GAS GENERATOR

J. L. Pierson, France

*Gr. 15, Cl. 3*

The present method concerns a method for preventing the oxidation and fusion of the parts serving to introduce air into a reverse combustion gas generator.

It is characterized by the use of so-called "calorized" metals, and by the separation of the hot zone by the intermediation of a flange.

Construction, as indicated here, can be achieved by the use, either of a part made of calorized steel consisting of a curved pipe bearing at its end a flange with a diameter sufficient to create an empty area below the pipe, or by a flange which is conical in shape with introduction of air around the coal by a part made of calorized steel bearing a series of holes, in such fashion as to project the air vertically onto the coal.

France 636,690

## IMPROVEMENTS IN GAS GENERATORS

Jacques-Gustave Schulz, France

*Jan. 14, 1928; application filed in Paris Oct. 25, 1926.**Gr. 15, Cl. 3*

The invention extends specially to the following characteristics and to their several combinations:

(1) A gas generator with reverse draft characterized by an air-inlet cone suspended in the middle of the fuel and open toward the bottom, the air necessary for combustion emerging from this cone and spreading over the combustion zone arranged below.

(2) A variant characterized by the fact that the cone is suspended to the body of the gas generator by the pipe leading the air to the said cone, this pipe also making it possible to introduce an ignition plug into the center of the gas generator.

France 636,750

## PROCESS FOR THE PRODUCTION OF WATER GAS

Harold Nielsen and Bryan Laing, England

*Jan. 16, 1928; application filed in Paris June 25, 1927**Application filed in England May 28, 1927**Gr. 15, Cl. 3*

The invention concerns a process for the production of water-gas starting from carbonaceous materials or from residues of their distillation. It bears essentially on the fact that calories are recovered in a heat accumulator for the purpose of supplying the necessary heat for accomplishing the reaction. The text describes the equipment necessary for putting the invention into practice.

France 637,906

## VERTICAL OVEN FOR REGENERATING FUMES INTO PRODUCER GAS FOR THE DISTILLATION AND GASIFICATION OF FUELS

Pierre-Eugène-Henri Forsans, France

*Feb. 13, 1928; Application filed in Paris Nov. 20, 1926.**Gr. 15, Cl. 3*

The present invention concerns a process and a vertical oven for its application, intended for the partial or total distillation and gasification of solid fuels, coal, lignite, etc., characterized by:

(1) Methods of circulating the products to be treated and the various fluids, including:

(a) *The descent of the fuel in the oven where it passes successively through the following treatment phases—namely: low-temperature heating or distillation; distillation at a high temperature, or coking; partial or total gasification of the coke formed; and finally, the final cooling of the remaining coke, by the cooled fumes originating from the heating of the oven itself.*

France 638,529

## IMPROVEMENT IN GAS GENERATORS

Paul Becudequin, France

*Feb. 21, 1928; application filed in Paris on Dec. 7, 1926.**Gr. 15, Cl. 3*

The purpose of the present invention is a gas generator of which the base of the firebox is terminated by a ring having a conical or cylindrical shape, the said ring, which contains the ashes or the slag, being animated by a motion of rotating which facilitates evacuation of the ashes and the slag, this device being adapted to all types of gas generator fireboxes with direct or so-called reverse combustion.

France 638,741

## STEAM AND HOT WATER-GAS GENERATOR

Julien Bellay, Belgium

*Feb. 27, 1928; application filed in Paris Aug. 2, 1927.**Application filed in Belgium Aug. 11, 1926.**Gr. 15, Cl. 3.*

The present invention concerns a gas generator of steam or hot water, with continuous operation, characterized by the fact that the retort enclosing the coke, the coal, etc., is surrounded by—or surrounds—a steam boiler, a steam pipe of which ends under the grate of the retort for the production of water gas, the water gas produced being used as such, or serving solely for heating the boiler, for the purpose of the production of steam or hot water with or without pressure, characterized by the fact that . . . the retort is annular in shape and arranged in a similarly annular boiler, the hot flames originating from burners disposed radially through the boiler passing in the space included between the retort and the boiler and escaping, by the central space of the retort, toward a vent.

France 638,926

## IMPROVEMENTS MADE IN PROCESSES FOR THE OBTAINING OF GAS IN A GAS GENERATOR AND INSTALLATION FOR THE PUTTING INTO EFFECT OF THESE PROCESSES

Jacques-Gustave Schulz, France

*Feb. 28, 1928; application filed in Paris Dec. 30, 1926.**Gr. 15, Cl. 3*

The invention concerns a process for the obtaining of gas in a gas generator, characterized by the fact that one part of the exhaust gases of the motor charged with carbonic gas is directed into the combustion zone of the gas generator, which lowers the temperature of the whole gas generator and can assure fuel economy.

France 639,683

## PROCESS AND APPARATUS FOR THE PRODUCTION OF GASEOUS FUELS

Imperial Chemical Industries, Ltd., England

*Mar. 13, 1928; application filed in Paris Aug. 19, 1927.**Application filed in England Sept. 11, 1926, in the name of Synthetic Ammonia & Nitrates, Ltd.**Gr. 15, Cl. 3*

The invention consists of a process for the continuous gasification of carbonaceous materials using steam and operating at a high temperature, this process being characterized by the fact that the steam and the carbonaceous material are introduced to react on each other in a receiving vessel, the walls of which are made of a heat-resistant metal, and in which the heat is supplied to this receiving vessel for the execution of the reaction.

France 640,216

**PROCESS FOR THE PREPARATION OF GAS WITH A HIGH CALORIFIC VALUE IN A GAS GENERATOR INSTALLATION**

Bamaq-Meguain A. G., Germany

*Mar. 24, 1928; application filed in Paris Aug 29, 1927.  
Gr. 15, Cl. 3*

The invention concerns the production of gas with a high calorific value in a gas generator installation. To this end, in conformity with the invention, the calories of the useful gas which were produced and previously superheated are used to degasify the coal in the distillation shaft. The invention permits of wholly degasifying the coal with the formation of large quantities of native tar in the distillation shaft. This latter, in turn, is used to operate the carburetion of the gas.

The text describes the equipment needed to put the invention into application.

France 642,315

**GAS GENERATOR**

I. G. Farbenindustrie A. G., Germany

*May 5, 1928; application filed in Paris Aug. 30, 1927.  
Application for additional patent filed in Germany  
May 7, 1927.**Gr. 15, Cl. 3*

The invention concerns:

(1) A gas generator for pulverized and granulated fuels, consisting of a cylindrical chamber with a horizontal axis, possibly flat in relation to its diameter, in which the fuel and the gasifying agents are tangentially introduced, preferably in several places on its periphery, separately or in common, in such fashion that the mixture shall be animated by a rotating motion in a single direction, without notable quantities of solid particles being deposited, and that the products formed by gasification shall leave the chamber by an orifice arranged toward the center of one of its lateral surfaces.

France 643,965

**PROCESS FOR OBTAINING A MIXED GAS STARTING WITH COKE OVEN GAS AND WATER GAS IN OVENS SERVING TO PRODUCE GAS AND COKE BY USING IN PART FUEL OF AN INFERIOR GRADE**

Dessauer Vertikal-Ofen G.m.b.H., Germany

*May 26, 1928; application filed Oct. 7, 1927 in Paris.  
Application filed in Germany Oct. 13, 1926.**Gr. 15, Cl. 3*

The invention concerns a process for the obtaining of a mixed gas composed of coke oven gas and water gas in ovens serving to produce gas and coke by using in part fuel of an inferior quality, a process characterized by the fact that coal is introduced into a retort or chamber heated externally, and in another retort or chamber externally heated, fuel of an inferior quality (coke fines), through which are made to pass the gases from the distillation of the coal; and by the fact that steam is introduced in the charge of coal after the charge of fuel of inferior quality shall have been brought to an incandescent state.

France 644,969

**IMPROVEMENTS IN APPARATUS FOR THE MANUFACTURE OF CARBURETED WATER GAS**

Humphreys &amp; Glasgow, Ltd., England

*June 25, 1928; application filed in Paris Dec. 1, 1927.  
Application filed in the U.S. Dec. 10, 1926.**Gr. 15, Cl. 3*

The invention concerns an installation for carbureted water gas including a superheater and a scrubber, the said group including the following characteristics:

(1) The arrangement in the path of the carbureted water gas passing from the superheater to the scrub-

ber, of a regenerator adapted for the storage of the sensible heat of the carbureted water gas, and equipped with sluices and piping for introducing a gas-fabrication fluid through the regenerator in the passage going to the installation.

France 645,090

**IMPROVEMENTS IN THE MANUFACTURE OF A GAS APPROPRIATE FOR HEATING AND LIGHTING**

Sydney James Brittiffe Tully and Oliver Evan Yeo, England

*June 25, 1928; application filed in Paris Dec. 3, 1927.  
Application filed in England Dec. 31, 1926.**Gr. 15, Cl. 3*

This invention includes:

An installation of the type including a gas generator for the production of gas; a coal or other fuel retort arranged above the gas generator and communicating freely and directly with it; a heating jacketing charged with a checkerwork of bricks, this jacketing being arranged close to the retort and communicating by its lower end with the upper part of the gas generator and by its upper end with a carburetion chamber. This installation being characterized by the fact that the upper end of the retort is isolated from the carburetion chamber and is equipped with an exhaust pipe for gas, intended to be connected to a gas collector other than the carburetion chamber, the upper end of the heating jacketing being in direct and constant communication with the carburetion chamber by a pipe which does not include an obturator [shutter].

France 645,494

**IMPROVEMENTS IN GAS GENERATORS WITH REVERSED COMBUSTION**

Jean-Louis Pierson, France

*June 27, 1928; application filed in Paris Dec. 9, 1927.  
Gr. 15, Cl. 3*

The invention consists of gas generators with reversed combustion, consisting of arranging around the air-inlet pipe emptying in the known manner in the midst of the fuel, a receiving vessel filled with cooling water, itself placed in the midst of the mass of fuel and directly subjected to the high temperature of the latter, in such manner as to protect the air-inlet pipe against any deterioration, and at the same time to achieve very rapid production of the steam which is mixed with the air and thus introduced into the gas generator.

France 646,581

**GRATE FOR GAS GENERATORS**

Société anonyme d'exploitation des brevets Cousin: Le Chauffage Industriel, France

*July 16, 1928; application filed in Paris Dec. 30, 1927.  
Gr. 15, Cl. 3*

The invention concerns a grate for gas generators remarkable, particularly, for the following characteristics:

(1) The grate is constituted by hollow, interchangeable bars supplied with carefully arranged air-vents, with means being provided to blow air into the said bars, which are arranged, in such manner, with relation to the hydraulic ashpit of the gas generator, that the air vents are constantly submerged.

France 647,711

**IMPROVEMENTS IN GAS GENERATORS**

The Wellman Smith Owen Engineering Corp., Ltd., and Alfred Vincent Kemp, England

*July 31, 1928; application filed in Paris Jan. 26, 1928.  
Application filed in England Feb. 5, 1927.  
Gr. 15, Cl. 3*

The invention concerns improvements whereby there is established:



(1) In a gas generator, the combination of the central blasthole with superposed distributors or blowing hoods amounted above the blasthole, and one or several valves adjustable from outside the gas generator in such fashion as to regulate the surface of the passage, or of the passages, between the upper end of the central blasthole and the adjacent distributor, or else between the distributors themselves.

France 649,301

**PROCESS FOR THE PRODUCTION OF FUEL GAS BY THE EXPENDITURE OF GRANULAR FUELS**

I. G. Farbenindustrie A. G., Germany

*Aug. 27, 1928; application filed in Paris Dec. 3, 1927.  
Gr. 15, Cl. 3*

The subject of the invention is a process for the production of fuel gas by the expenditure of moist granular fuels, consisting of drying the latter in the upper part of the gas generator or outside the latter, preferably by means of the hot gases themselves, and of stirring the charge of fuel by an agitator which is preferably cooled.

France 649,780

**PROCESS FOR THE PRODUCTION OF WATER GAS AND HYDROGEN**

Imperial Chemical Industries, Ltd., England

*Sept. 4, 1928; application filed in Paris Feb. 9, 1928.  
Application filed in England Feb. 22, 1927.  
Gr. 15, Cl. 3*

The invention consists of a process for the carbonization of coal at low temperature and the production of gas, the said process being characterized by the fact that:

(a) Coal presenting high agglutinating properties (and taken, preferably, in a finely divided state) is preheated in the presence of oxygen in order to control its agglutinating properties, and carbonized at temperatures not exceeding 600° C. in such fashion as to produce a large quantity of semicoke in pieces;

(b) The semicoke thus obtained is next treated with steam in a water-gas generator and gasified, preferably at a high speed by an excess of steam and with use of a thin fuel bed;

(c) The hot semicoke is, preferably, sent directly to the low-temperature retort in the water-gas generator.

France 649,927

**GAS GENERATOR**

Paul Heumez and Edmond Hubert, France

*Sept. 10, 1928; application filed in Paris Aug. 3, 1927.  
Gr. 15, Cl. 3*

The invention concerns:

A gas generator with reversed combustion, with operation by blowing or by exhausting, with fuels with an abnormally high content of condensable volatile materials or of moisture (moist or green wood, resinous wood, ligneous fuels, sawdust, peat, etc.), characterized by a nozzle for collecting of gas, arranged in the midst of the mass of fuel and ashes and independent of the ashpit, which makes it possible to separate from the usable gases, the liquid resinous products and cause them to descend into the ashpit, thereby avoiding, entirely or in part, the combustion and reduction zones.

France 650,475

**PROCESS FOR THE GASIFICATION OF COAL**

Otto Gross, Germany

*Sept. 24, 1928; application filed in Paris Mar. 6, 1928.  
Application filed in Germany Apr. 23, 1927.  
Gr. 15, Cl. 3*

The invention consists of a process for the complete gasification of fuel containing volatile elements in order

to produce a gaseous mixture containing hydrogen and suitable for use in ammoniac synthesis or in analogous catalyzing operations, the said process being characterized by the fact that the fuels are gasified with oxygen and steam and that the hydrocarbons contained in the gas produced are transformed into carbon monoxide and into hydrogen by means of oxygen, or by means of oxygen and steam.

France 650,961

**PROCESS FOR THE MANUFACTURE OF HYDROGEN AND ITS APPLICATION TO THE MANUFACTURE OF ILLUMINATING GAS**

Demetrio Futacchi, France

*Oct. 2, 1928; application filed Mar. 17, 1928 in Paris.  
Gr. 15, Cl. 3*

Process for the manufacture of hydrogen consisting of causing a mixture of gases containing essentially carbon monoxide and hydrogen (notably all types of industrial gases) to pass on ordinary iron (in a state of milling shavings, iron scrap or anvil dross, preferably), in the presence of steam and at a high temperature (650° to 750° C., for example); and this until the integral transformation of the carbon monoxide into hydrogen.

In the event that the gaseous mixture from which the process starts should contain methane, the latter can be transformed into hydrogen by cracking of the methane in the presence of iron at a high temperature.

France 651,638

**PROCESS AND DEVICE FOR THE USE OF HEAT LOST FROM BLOWING GASES DURING THE WATER-GAS PROCESS**

Frankfurter Gasgesellschaft and Franz Reichard, Germany

*Oct. 15, 1928; application filed in Paris Mar. 19, 1928.  
Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the use of heat lost from blowing gases during the water-gas process, the said process including the introduction of an additional fuel, for the blowing of boilers with lost heat or their equivalent, characterized by the fact that the mixture of additional fuel is fed continuously but is throttled during the blowing period, the water gas not traversing the boiler.

France 652,277

**PROCESS FOR THE PRODUCTION OF A MIXED GAS COMPOSED OF COKE-OVEN GAS AND WATER GAS**

Walter Schweder, Germany

*Oct. 22, 1928; application filed in Paris Apr. 5, 1928.  
Application filed in Germany Apr. 6, 1927.  
Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the production of a mixed gas composed of coke oven gas and water gas, the said process being characterized by the fact that hot coke, emerging from the distillation chambers of the oven, is introduced in a still incandescent state into a gas generator in which steam is introduced in order to produce the water gas serving as an added gas.

France 652,849

**IMPROVEMENTS IN DEVICES FOR EQUALIZING THE SURFACE OF MATERIALS IN FRAGMENTS CHARGED INTO APPARATUS, PARTICULARLY THOSE FOR GAS GENERATORS**

Léopold van Gulck and August-Marie Fourlinnie, France

*Oct. 29, 1928; application filed in Paris Mar. 26, 1928.  
Application filed in Belgium Apr. 9, 1927.  
Gr. 15, Cl. 3*

The subject of the invention is improvements in devices for equalizing the surface of materials in fragments charged into apparatus, the said improvements consisting, principally, of causing to be included in

the devices of the type in question, at least one organ such as to be (and this one equipped with means which themselves shall cause the said organ to be) animated simultaneously by a rotating motion around an axis and a swinging motion, at the same time dipping a certain quantity into the charge of material to be equalized.

France 653,424

#### IMPROVEMENTS IN GAS GENERATORS

Walter M. Cross, U.S.A.

Nov. 8, 1928; application filed in Paris Apr. 25, 1928.  
Application filed in U.S.A. Apr. 28, 1927.

Gr. 15, Cl. 3

In this process, producer gas is produced by introducing into a reaction zone a pulverized carbonaceous fuel mixed with air and steam which have been previously heated to or above the temperature at which the reaction of the fuel on this mixture of air and steam produces gas. This high temperature of the mixture of air and steam is obtained by directing this mixture through heat exchangers through which the hot gases produced pass. No other heat is supplied to the reaction zone and the process is continuous. The temperature of the mixture of air and steam is automatically regulated so as to remain at or above the reaction temperature.

France 655,183

#### IMPROVEMENTS IN THE PRODUCTION OF CARBURETED WATER GAS

Paul Dvorkovitz, England

Dec. 8, 1928; application filed in Paris June 2, 1928.

Gr. 15, Cl. 3

The invention consists of a process for the manufacture of carbureted water gas, in which this gas is enriched and its calorific value augmented by the addition of oil gas, and characterized by the fact that the fixed oil gas is produced separately from the water gas by gasifying oil at a uniform temperature determined in advance and such that the fixed gas produced, mixed with the water gas, shall show the maximum value in calorific value.

France 655,622

#### GAS GENERATOR APPARATUS OPERATING THE DISTILLATION AND GASIFICATION OF BITUMINOUS FUELS

Albert Breisig, Austria, and Compagnie Continentale pour la Fabrication des Compteurs et autres Appareils, France

Dec. 28, 1928; application filed in Paris June 11, 1928.  
Application filed in Austria June 30, 1927.

Gr. 15, Cl. 3

The invention concerns:

(1) A gas generator apparatus, performing the distillation and gasification of bituminous materials, characterized by the fact that in the middle of the generator there is arranged a metal column cooled to a temperature only a little higher than that for the condensation of steam . . . characterized by the fact that . . . the column is installed in the form of a steam boiler; . . . the column is arranged only in the distillation space of the generator; . . . the column forming a boiler arranged in the center and the jacketing of the generator constituted in the known manner as a boiler, are connected to a common steam collector.

France 656,062

#### IMPROVEMENTS MADE IN THE USE OF THE HEAT CONTAINED IN THE COKE FOR CHARGING COKE OVENS, GAS RETORTS, OR OTHERS

N. V. Silica en Ovenbouw Mij. and Walther Hiby,  
Netherlands

Dec. 24, 1928; application filed in Paris June 18, 1928.  
Application filed in England June 30, 1927.

Gr. 15, Cl. 3

The invention concerns a method of using the heat

contained in the coke discharged from coke ovens, gas retorts or other [type ovens] for carbonizing coal or other materials, consisting of leading the said hot coke and the said material into contact in a chamber intended to be closed and connected to an installation for the recovery of the products of the carbonization, the hot coke and the said material being mixed together before or during the operation of charging the chamber.

The invention is also characterized by the fact that:

(1) To the materials contained in the chamber, while they are still hot, a fresh quantity of coal is added, or other material containing a percentage of water which is such that the said water will be evaporated by the heat remaining in the said materials contained in the chamber.

France 658,744

#### IMPROVEMENTS IN THE MANUFACTURE OF MIXED GAS STARTING WITH FUELS WITH VOLATILE MATERIALS

Humphreys & Glasgow, Ltd., England

Jan. 28, 1929; application filed in Paris Oct. 8, 1927.  
Application filed in the U.S.A. Oct. 13, 1926.

Gr. 15, Cl. 3

The present invention concerns a process for the manufacture of mixed gas starting with fuels with volatile materials, the said process including the following characteristics:

(1) A sequence of operations consisting of establishing a fuel bed in two divisions; of blowing on the lower part of each division and of storing the heat of the gases blown; the injection of steam in a rising direction throughout one division in order to manufacture water gas and in order to release coal gas at the top; the injection of steam in a descending direction in the lower part of the other division: the heating of the water gas resulting from this injection of steam in a descending direction by means of the heat stored during the blowing mentioned above; the passage of the heated water gas through the upper part of the division receiving the ascending steam, together with the water gas engendered and the coal gas released in that division; and the removal of the mixed gas.

France 659,426

#### PROCESS FOR OBTAINING WATER GAS ON A CONTINUOUS OPERATION BASIS

Gas und Teer G.m.b.H., Germany

Feb. 4, 1929; application filed in Paris Aug. 23, 1928.

Gr. 15, Cl. 3

The present invention concerns a process for obtaining water gas by means of a gaseous current passing into a heater and into a gasification space, characterized by the fact that the pulverized fuel to be gasified is mixed in the current of heated gas.

France 659,427

#### PROCESS AND DEVICE FOR THE OBTAINING OF WATER GAS STARTING WITH COAL DUST AND STEAM

Gas und Teer A.G., Germany

Feb. 4, 1929; application filed in Paris Aug. 23, 1928.  
Applications for four patents filed in Germany Aug. 24, 1927.

Gr. 15, Cl. 3

The present invention concerns a process for the continuous obtaining of water gas starting with coal dust or coke, and steam, characterized by the fact that the heat necessary for the formation of the gases is contributed by regenerators, and that the heating of the latter [regenerators] is obtained by the combustion of a partial flow of the produced water gas.

Preferably:

(1) The production of superheated hot gas is accomplished without the use of distribution organs exposed

to high temperatures by a depression created at the point of production of the flow of hot gas on the principal flow, and which is regulated by an appropriate determination of the resistance of the gas path and orifices traversed by the gas flow and by an appropriate arrangement of valves or ventilators placed on the apparatus in the cold sections of the gas path.

France 659,699

**IMPROVEMENTS IN THE MANUFACTURE OF MIXED GAS**

Humphreys & Glasgow, Ltd., England

*Feb. 11, 1929; application filed in Paris Oct. 8, 1927.*

*Application filed in the U.S.A. Oct. 13, 1926.*

*Gr. 15, Cl. 3*

The present invention concerns a process and apparatus for the manufacture of mixed gas with fuels with a high volatile content, and includes the following characteristics:

(1) The operations which consist of blowing on the lower part of a fuel bed, and of storing the heat from the blowing gases; of effecting a normal manufacture through the fuel bed, of carbureting and fixing another gas by the heat stored during blowing, and of introducing this latter gas into the fuel bed above part of this bed; of engendering coal gas by causing carbureted gas and blue gas to pass in mixture through the upper part of the fuel bed (the said carbureted gas and blue gas resulting from normal manufacturing); and of removing the mixed gas.

France 659,700

**GAS GENERATOR**

Otto Misch, Germany

*Feb. 11, 1929; application filed in Paris Dec. 6, 1927.*

*Gr. 15, Cl. 3*

The present invention relates to the use, in a device for the production of fuel gas possessing a calorific value of 1,600 to 2,000 calories by means of bituminous fuels, particularly lignite, and of a vessel for the extraction of gas, the contents of which, is brought in from outside at a very high temperature, and to which there is vertically connected a vessel equipped simply with a steam inlet and appropriate for the production of water gas by uninterrupted treatment by means of steam of the incandescent coke descending from the gas-extraction vessel, the said water-gas vessel being in turn extended by means of a generator equipped with an air inlet and in which the remainder of the fuel circulating downward and originating from the water-gas generator, mentioned before, are converted into producer gas.

France 659,729

**IMPROVEMENTS IN PROCESSES AND DEVICES FOR THE DISTILLING OF CARBONACEOUS MATERIALS**

Lewis Cass Karrick, U.S.A.

*Feb. 11, 1929; application filed July 30, 1928 in Paris.*

*Gr. 15, Cl. 3*

The present invention concerns improvements in the processes and apparatus for distilling carbonaceous materials, the said improvements being characterized by the following points:

(1) Carbonaceous materials are fed into retorts in which the said materials are exposed to superheated steam; the volatile products are distilled and evacuated; the volatile products and the steam are condensed in a heat-transmission apparatus; the latent heat liberated by the condensation of the said steam, and coming from the volatile materials, is used to produce a fresh quantity of steam, for example, by causing water to boil in the said apparatus, and this fresh quantity of steam is sent to a second retort for heating the carbonaceous materials in the said second retort.

France 659,730

**IMPROVEMENTS IN THE PROCESSES AND APPARATUS FOR THE PRODUCTION OF GAS, OIL, AND OTHER CARBONACEOUS MATERIALS**

Lewis Cass Karrick, U.S.A.

*Feb. 11, 1929; application filed in Paris July 30, 1928.*

*Gr. 15, Cl. 3*

The present invention concerns processes and apparatus making it possible to extract, from coal and other carbonaceous materials, gas, oil, and other products. It is represented here in its application to a commercial installation permitting the withdrawal of the products in question from coal. In the present description, various lots of coal are differently treated in different apparatus, which makes it possible to use, in a first type of process, large [size] coal, whereas, the fines which unfailingly accompany large [size] coal are used in other types of phases of the process, which permits the economic use of steam as a heating agent. All the coal is thus used in the type of process most suited to it.

France 660,122

**GAS GENERATOR FOR THE PRODUCTION OF OIL GAS EXTRACTED FROM BITUMINOUS FUELS**

Otto Misch, Germany

*Feb. 12, 1929; application filed in Paris Sept. 10, 1928.*

*Gr. 15, Cl. 3*

The present invention consists of:

(1) A gas generator for the production of oil gas extracted from bituminous fuels, consisting of a water-gas generator above which is arranged a distillation retort which is brought to a high temperature, from outside, by intensive heating, for example by oil burner, by coal-dust firing, by compressed air flame, etc., characterized by the fact that the outlet for the distillation gases is arranged below the distillation retort, in such fashion that the fuel vapors produced near the charging device for the fuel can be diluted in their long passage through the distillation retort.

France 660,212

**IMPROVEMENTS IN INSTALLATIONS FOR THE PRODUCTION OF GAS AND THE RECOVERY OF OIL**

Frederick Lindley Duffield, England

*Feb. 18, 1929; application filed in Paris Sept. 3, 1928.*

*Application filed in England Nov. 1, 1927.*

*Gr. 15, Cl. 3*

The invention includes:

(1) A process for the production of gas and for the recovery of oils starting with pulverized fuels; consisting of drying the fuel by air; of totally or partially evacuating the volatile materials from the fuel which is then collected; of burning a part of the carbonized fuel in a combustion chamber; of introducing the other part of the carbonized fuel (designated hereinafter as the secondary fuel) in a chamber in order to form, with the combustion gases, carbon monoxide; and finally of collecting the gases thus produced.

France 663,059

**GAS GENERATOR**

Jules Mennig, Belgium

*Mar. 29, 1929; application filed in Paris Oct. 26, 1928.*

*Application filed in Belgium Oct. 31, 1927.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator characterized by the fact that the steam necessary for the production of the gas is obtained by causing water to run between the firebox shaft and the casing of the latter, in such fashion that it is vaporized by the radiant heat of the shaft without coming in contact with this heat; this gas generator being further characterized by:

(a) baffles superimposed and arranged between the casing and the shaft, at a certain distance from the latter;

(b) the said baffles being constituted of buckets attached to the doors of the sightholes which give access into the casing.

France 665,910

**PROCESS FOR REGULATING GAS GENERATOR INSTALLATIONS**

Motorenfabrik Deutz A. G., Germany

*May 13, 1929; application filed in Paris Dec. 15, 1928.*  
*Application filed in Germany on Dec. 16, 1927.*

*Gr. 15, Cl. 3*

The present invention concerns a process for regulating gas generator installations including several hearths, and with a variable charge, the said process being characterized by the fact that a mechanism is used which is dependent on the operating rhythm of the gas generator, in particular of the temperature; and by the fact that it is made to act on the admission of air at one of the air-inlet points at a corresponding point in the gas generator when the desired temperature is exceeded, and to increase it in the contrary case.

France 666,306

**GAS GENERATOR IN WHICH THE AIR NECESSARY FOR GASIFICATION IS INTRODUCED BY SEVERAL NOZZLES**

Zahn & Co. G.m.b.H., Germany

*May 18, 1929; application filed in Paris Dec. 22, 1928.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator in which the air necessary for gasification is introduced by several nozzles projecting into the fuel, the one being able to be rationally moved in relation to the other in their reciprocal distance from each other, characterized by:

(1) The fact that several rows of nozzles are provided, or several rows of devices for the flowing of gas, or several rows of nozzles and devices for the flowing of gas, which are put into operation according to need, and which make it possible to observe exactly the different heights of the charge which are the most appropriate for the fuel in each case.

France 668,924

**GAS GENERATOR**

I. G. Farbenindustrie, A. G., Germany

*July 23, 1929; application filed in Paris Feb. 4, 1929.*  
*Application filed in Germany Feb. 9, 1928.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A gas generator for the production of fuel gases starting with granular fuels, including, if necessary, dust, in which the gasifying agents are blown in such fashion that the fuel shall be animated throughout its entire height by an undulating or rotating up and down motion, characterized by a bell-mouthed chamber for the gasification of coal dust swept along by means of additional gasifying agents.

France 669,763

**PULVERIZED COAL GAS GENERATOR**

Bamag-Meguain A. G., and Oswald Heller, Germany

*Aug. 10, 1929; application filed in Paris Feb. 16, 1929.*  
*Application filed in Germany Feb. 17, 1928.*

*Gr. 15, Cl. 3*

The invention consists of a pulverized coal gas generator combined with a device for producing water gas at a high temperature, presenting the following characteristics:

(1) The gas heater constructed in the manner of a heat accumulator is connected with the reaction cham-

ber by a pipe arranged from bottom to top in a closed enclosure, and it is equipped with one or several orifices emptying upward; the whirling gases mixed with the pulverized coal penetrate from bottom to top into the reaction chamber, then are directed in the opposite direction, and the gases formed after the reaction, as well as the ashes, are evacuated by one or several orifices provided under the reaction chamber. The admission of pulverized coal into the reaction chamber is achieved by means of two gaseous currents, in such fashion that the coal dust is introduced by a distributor in the form of an emulsion by means of primary gas at high pressure and with slight volume into a current of whirling gas with a heavy flow at a high temperature.

France 669,788

**PROCESS FOR THE OBTAINING OF WATER GAS ON A CONTINUOUS OPERATION BASIS BY MEANS OF COMBUSTIBLE GRANULAR MATERIALS**

I. G. Farbenindustrie A. G., Germany

*Aug. 10, 1929; application filed in Paris Feb. 18, 1929.*  
*Application for additional patent filed in Germany Feb. 21, 1928.*

*Gr. 15, Cl. 3*

The invention refers to a process for the continuous production of water gas by means of granular fuels which, if necessary, may contain dust, in which the gasification agents are blown into the gas generator in such fashion that the granular charge is animated throughout its entire height by a whirling up-and-down motion; characterized by the fact that the contribution of heat which is necessary for the generation of the water gas is assured by means of specially heated heating bodies, preferably with simultaneous use of superheated steam.

France 669,789

**PROCESS FOR THE GENERATION OF FUEL GASES STARTING WITH GRANULAR FUEL MIXED WITH DUST**

I. G. Farbenindustrie A. G., Germany

*Aug. 10, 1929; application filed in Paris Feb. 18, 1929.*  
*Application filed in Germany Feb. 22, 1928.*

*Gr. 15, Cl. 3*

The invention concerns a process for the generation of fuel gases by means of granular fuels charged with dust, which are maintained in suspension or swept along during gasification by the gasifying agents, and characterized by the fact that in order to obtain as complete a gasification as possible of the fuel, the introduction of which takes place from below, the gasification agents are blown into the gasification chamber at several different levels, the hot gaseous mixture, which is still charged with coal dust, being then obliged to traverse a vast secondary gasification chamber.

France 672,164

**PROCESS AND GAS GENERATOR FOR THE MANUFACTURE OF WATER GAS BY MEANS OF PULVERIZED FUELS**

Max Heller, Germany

*Sept. 14, 1929; application filed in Paris Mar. 27, 1929.*  
*Application filed in Germany Apr. 2, 1928.*

*Gr. 15, Cl. 3*

The invention concerns a process for the manufacture of water gas starting with pulverized fuel, a process characterized by the fact that the pulverized fuel and steam are blown into the decomposition chamber in such fashion that they circulate in that chamber, which is externally heated.

France 672,775

## PROCESS FOR THE MANUFACTURE OF WATER GAS EXTRACTED FROM BITUMINOUS FUELS IN THE OPERATION OF GAS PRODUCERS OR GENERATORS

Dellwik-Fleischer Gas G.m.b.H., Germany

Sept. 23, 1929; application filed in Paris Apr. 6, 1929.  
Application filed in Germany Dec. 19, 1928.  
Gr. 15, Cl. 3

A process for the production of oil gas extracted from bituminous fuels in a water-gas generator which is preceded by a carbonization retort or a slow combustion retort heated from outside by an intensive hearth, a process characterized by the fact that the distillation gases from the retort are extracted exclusively by outside heating and that both this distillation gas and the water gas are separately withdrawn from the gas generator, without the water gas being used as a gas for sweeping or a gas for use in the carbonization or slow combustion retort.

France 673,060

## PROCESS AND DEVICE FOR PHYSICAL AND CHEMICAL TREATMENT, IN PARTICULAR DRYING, CARBONIZATION, DISTILLATION, GASIFICATION, OR COMBUSTION OF PULVERIZED FUELS

Karl Geissen, Germany

Sept. 30, 1929; application filed in Paris Apr. 13, 1929.  
Application filed in Germany Apr. 20, 1928.  
Gr. 15, Cl. 3

The invention consists of:

(1) A process for the physical or chemical treatment of materials, in particular drying, carbonization, distillation, gasification, or combustion of fine-grained or pulverized material, a process characterized by the fact that the gases or vapors are fed to a bed, spread out on a substantially horizontal support, of fine-grain and pulverized materials to be treated, by openings in the form of channels made in the support, filled and covered by means of movable or fixed fittings in the form of cowls or valves in such fashion as to prevent on the one hand the entrance of the materials to be treated into the gas-inlet ducts and on the other hand to produce in the ducts a resistance to the flow, channels that are large in relation to the passage in the bed of material to be treated, in order that the gases or vapors thus led shall traverse the bed being treated by distributing themselves uniformly without causing the formation of blow holes.

France 680,166

## PROCESS FOR THE FUSION OF ASHES IN HOT-AIR ASH-FUSION GAS GENERATORS

La Fluorine Française, France

Jan. 17, 1930; application filed in Paris Aug. 10, 1929.  
Gr. 15, Cl. 3

The present invention concerns a process for carrying out continuous operation and a better production in hot-air ash-fusion gas generators.

This process is characterized by the combination of the application in these apparatus:

(1) Of fluorspar as the element entering into reaction and as flux;

(2) Of additional injections of steam at appropriately chosen points of the mass treated above the blast orifices for the hot air.

France 680,849

## GAS GENERATOR FOR THE PRODUCTION OF GASEOUS MIXTURES OF CARBON MONOXIDE AND HYDROGEN BY MEANS OF THE CONTINUOUS GASIFICATION OF COMBUSTIBLE SOLIDS

Società Italiana Ricerche Industriali, Italy

Jan. 23, 1930; application filed in Paris Aug. 27, 1929.  
Gr. 15, Cl. 3

The invention consists of a gas generator for the production of mixtures of carbon monoxide and hydrogen by means of the gasification of solid fuels with the aid of oxygen or a mixture of oxygen and steam or oxygen and carbon dioxide essentially characterized by the fact that:

(a) In the lower part of the gas generator, one or several blast orifices are placed which penetrate into the mass of the fuel and through which the oxygen or the abovementioned mixtures used for gasification are introduced.

(b) The internal space of the gas generator is divided with the aid of a vertical wall into two parts, one of which is occupied by the fuel to be gasified, while the other forms a pipe which serves for the extraction of the gaseous mixture produced and the ashes, this pipe being in communication at its upper part with the outlet pipe of the gaseous mixture produced, while at its lower part it arrives as far as a zone in which the gaseous mixture produced is virtually free of carbon dioxide.

(c) Combustion is effected without a grate;

(d) The interior lining of the gas generator is made with the aid of an ordinary refractory material.

France 681,050

## PROCESS FOR THE MANUFACTURE OF A GAS RICH IN HYDROGEN AND CARBON DIOXIDE STARTING WITH LIGNITE

Verein für Chemische und Metallurgische Produktion, Germany

Jan. 27, 1930; application filed in Paris Aug. 30, 1929.  
Application filed in Germany on Sept. 6, 1928.  
Gr. 15, Cl. 3.

The invention concerns a process for the manufacture of a gas rich in hydrogen and carbon dioxide starting with lignite by means of gasification with steam, characterized by the fact that dehydrated and more or less carbonized lignite, and in a condition to react already sufficiently with steam at temperatures between 500° and 800°, is hot blown periodically at a gasification temperature included between 600° and 700°, and then treated by a large excess of steam which, before its action, has been superheated to a relatively high temperature, an appropriate temperature being between 400° and 700°.

France 681,775

## PROCESS FOR THE MANUFACTURE OF A GAS RICH IN HYDROGEN AND IN CARBON DIOXIDE STARTING WITH LIGNITE

Verein für Chemische und Metallurgische Produktion, Czechoslovakia

Feb. 4, 1930; application filed in Paris Sept. 13, 1929.  
Application filed in Czechoslovakia Sept. 20, 1928.  
Gr. 15, Cl. 3.

(1) Process for the manufacture of a gas rich in hydrogen and in carbon dioxide starting with lignite, by gasification with steam, characterized by the fact that dehydrated and more or less carbonized lignite, which is in a condition to already react sufficiently with steam at temperatures between 500° and 800°, is treated after hot blowing at a gasification temperature lower than 800°, with a large excess of heated steam, and that the mixture of water gas and steam

thus formed is used for the drying and carbonization of the crude lignite.

France 681,816  
GAS GENERATOR  
Willy Goerz, France

*Feb. 4, 1930; application filed in Strasbourg Sept. 13, 1929.*

*Gr. 15, Cl. 3.*

The invention concerns:

(1) A gas generator for the gasification of all types of solid fuels; characterized by the combination of a box with a prismatic cross section with a fuel shaft with a quadrangular cross section mounted on the said box, the shaft being tapered upward and terminating at the top with a short filling funnel, while a gasification chamber is arranged inside the box, closed below, and constructed with an evacuation passage at the rear for the gases produced.

France 682,275

IMPROVEMENTS IN GAS GENERATORS

Humphreys & Glasgow, Ltd., England

*Feb. 11, 1930; application filed in Paris Sept. 25, 1929. Application filed in the U.S.A. on Oct. 18, 1928.*

*Gr. 15, Cl. 3.*

The invention concerns a gas generator in which the mass of fuel is supported by a rotating vessel, preferably in the form of a reversed cone, placed in the lower part of the generator, and presenting a central opening through which the ashes are expelled.

France 682,701

PROCESS FOR THE MANUFACTURE OF A MIXED GAS WITH AN OIL-GAS AND WATER-GAS BASE

Humphreys & Glasgow, Ltd., England

*Feb. 17, 1930; application filed in Paris Oct. 3, 1929. Application filed in the U.S.A. Jan. 3, 1929.*

*Gr. 15, Cl. 3*

Process for the manufacture of a mixture of regenerated oil gas and water gas, characterized by the fact that air is injected into an incandescent fuel bed; the gases produced are burned while they are traversing a chamber in order to heat the latter; oil is passed into this chamber in the same direction as that of the gases coming from the injection of air, then into the fuel bed in order to vaporize the oil and produce cracking of the vapors with reconstitution of the gas and deposit of the carbon in the fuel bed; and steam is injected into this fuel bed in order to produce water gas and extract the carbon deposited.

France 682,749

IMPROVEMENTS IN THE PRODUCTION OF MIXTURES OF OIL GAS AND OF WATER GAS

Humphreys & Glasgow, Ltd., England

*Feb. 18, 1930; application filed in Paris Oct. 4, 1929. Application filed in the U.S.A. Dec. 29, 1928.*

*Gr. 15, Cl. 3*

The invention consists of a process for producing a mixture of reconstituted oil gas and water gas including the following phases: blowing of air onto a fuel bed which is incandescent, and the combustion of the gases resulting from this blowing in a chamber in order to heat the latter; simultaneous introduction into the said chamber of oil and gas coming from a foregoing operation, in order to cause the oil and the oil-gas vapors produced to be swept through the fuel bed by the gas introduced; and the injection of steam onto the fuel bed in order to produce water gas.

France 682,993

IMPROVEMENTS IN THE MANUFACTURE OF MIXED GAS WITH AN OIL-GAS AND WATER-GAS BASE

Humphreys & Glasgow, Ltd., England

*Feb. 24, 1930; application filed in Paris Oct. 10, 1929. Application filed in the U.S.A. Jan. 3, 1929.*

*Gr. 15, Cl. 3*

The invention refers to a method and apparatus for the production of a mixture of oil gas and water gas obtained in a generator containing a fuel bed, characterized by the fact that:

(1) The tars are removed from the gas; it [the gas] is injected through the fuel bed; the tars are once more removed from it; it [the gas] is passed once more through the fuel bed; and fresh quantities of tar are once more extracted from the gas;

(2) The apparatus includes a generator, a carburetor, and a superheater connected in series; means for injecting gas through the fuel bed; means for removing the tars from the gas before its passage into the fuel bed; and means for removing the tar from it after its passage.

France 683,024

PROCESS FOR THE DIRECT OBTAINING OF TOWN GAS BY THE GASIFICATION OF COAL

Compagnie Continentale pour la Fabrication des Compteurs et Autres Appareils, France

*Feb. 24, 1930; application filed in Paris Jan. 22, 1929.*

*Gr. 15, Cl. 3*

The present invention concerns a process for the direct obtaining of town gas by gasification of coal, consisting of adding to known industrial gases, for example to integral gasification gas, hydrogen coming from the treatment by known methods of water gas extracted from the apparatus producing the industrial gas.

France 684,855

IMPROVEMENTS IN WATER-GAS GENERATORS

Humphreys & Glasgow, Ltd., England

*Mar. 24, 1930; application filed in Paris Nov. 14, 1929. Application filed in the U.S.A. on Dec. 7, 1928.*

*Gr. 15, Cl. 3*

The invention consists of a water-gas generator intended to contain a mass of fuel, including in combination a jacket of water arranged at the lower part of the generator; a rotating grate including a central blowing device with orifices and a base for crushing slag and expelling ashes, this base extending externally in relation to the tuyère or blowing device as far as the periphery of the mass of fuel and including vertical cutting blades; means for injecting air and steam from bottom to top through the orifices of the blowing device and including an opening provided at the base of the latter; means for causing the steam to pass from above to below through the fuel bed, and to cause water gas to pass from above to below through the orifices of the blowing device and through the openings formed in the latter, the total cross section of the said orifices being in principal equal or greater than the cross section of the said opening.

France 685,129

PROCESS FOR THE PRODUCTION OF GENERATOR GAS

Metallgesellschaft A. G., Germany

*Mar. 25, 1930; application filed in Paris Nov. 18, 1929.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the gasification of fuels by means of oxygen or air rich in oxygen, mixed with steam, by returning to the gas generator a part of the gas pro-

duced in the course of the process itself, characterized by the fact that the gas in circulation is introduced with the gasification agent into the gas generator in such fashion that it burns with a part of the oxygen, even before the gasification agent shall have acted on the coal to be gasified.

France 685,161

**IMPROVEMENTS IN GAS GENERATORS**

Humphreys & Glasgow, Ltd., England

*Mar. 25, 1930; application filed in Paris Nov. 19, 1929.  
Application filed in the U.S.A. Jan. 21, 1929.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) An apparatus for the manufacture of gas, including a generator for containing a mass of fuel, and plates with tapering cross section, mounted in the upper part of this generator and dividing the latter into compartments connected together, preferably open at their outer and inner ends.

(2) Apparatus of the type specified, characterized also by . . . the fact that . . . the said plates are mounted in the upper part of the generator in such fashion that they may be given a to-and-fro motion, or that one can move them in another way, in order to form fissures or passages in the mass of fuel.

France 685,638

**GAS GENERATOR**

Albert Leet Galusha, U.S.A.

*Apr. 1, 1930; application filed in Paris Nov. 27, 1929.  
Gr. 15, Cl. 3*

The invention concerns a gas generator characterized by the fact that:

(1) A feed hopper for fuel is arranged above the combustion chamber, and one or several tubular passageways cause this hopper to communicate with the combustion chamber and permit feeding the fuel in a continuous stream departing from the feed hopper to the combustion chamber of the gas generator.

(2) A fuel-storage hopper is superimposed on the feed-hopper, and a device is provided making it possible to control the flow of fuel departing from the storage hopper into the feed hopper, as well as the flow of fuel from the said feed hopper by the feed passageways to the gas generator.

France 687,244

**DEVICE FOR THE REMOVAL OF DISTILLATION PRODUCTS FROM THE LOWER PART OF DEGASIFICATION CHAMBERS**

Aug. Klönne, Germany

*Apr. 28, 1930; application filed in Paris Dec. 26, 1929.  
Gr. 15, Cl. 3*

The present invention concerns a device for removing distillation products from the lower part of the degasification space, characterized by the fact that the cross section of the degasification area is widened at the lower end in such fashion that the distillation material entering this widened section falls, as a result of its natural angle of slope, to fill more than one part of the widened section, and leaves a space appropriate for the drawing off of the distillation products and the introduction of steam.

A device in accordance with the foregoing, characterized by the fact that the pipe which removes the distillation products from the hollow space, is divided and empties above into the upper outlet pipe.

France 687,883

**PROCESS FOR THE PRODUCTION OF GAS WITH A HIGH CALORIFIC VALUE, STARTING WITH BITUMINOUS COALS**

I. G. Farbenindustrie A. G., Germany

*May 5, 1930; application filed in Paris Jan. 9, 1930.  
Application filed in Germany Jan. 10, 1929.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for manufacturing gas with a high calorific value, especially illuminating gas, starting with bituminous coals, consisting of heating them in a granular or finely divided state, in chambers susceptible of being periodically heated at temperatures of 900° C. and higher, provided with an interior stacking preferably in checkerwork form, constituting a heat reservoir.

(2) Hot coke obtained according to the process defined in (1) above is used for the production of gas which is used for the periodic heating of the chambers.

France 688,529

**PROCESS FOR THE DISTILLATION AND GASIFICATION OF FUELS**

Theodor Lichtenberger, Ludwig Kaiser, and Franz Meyer, Germany

*May 13, 1930; application filed in Paris Apr. 10, 1929.  
Gr. 15, Cl. 3*

The invention concerns . . . a process for the treatment of fuels, characterized by the fact that the fuels are distilled in a bath of molten salts . . . and a variation of the said process in accordance with which the fuels are gasified in a bath of molten salts.

France 689,854

**PROCESS FOR THE COOLING OF INCANDESCENT COKE, WITH SIMULTANEOUS PRODUCTION OF WATER GAS**

N. V. Silica en Owenbouw Mij., Netherlands

*June 3, 1930; application filed in Paris Feb. 13, 1930.  
Application filed in Germany Feb. 14, 1929.*

*Gr. 15, Cl. 3*

Process for the cooling of incandescent coke, with simultaneous production of water gas, by means of steam or water traversing the latter in contrariwise circulation, in a vertical circular receptacle receiving the coke, characterized by the fact that the water gas obtained, immediately after having left the cooling shaft, is conducted into a chamber containing a reduction agent, preferably coke fines, in which a reduction temperature is maintained which is sufficient to permit the virtually complete dissociation of the CO<sub>2</sub> contained in the water gas, which is transformed into CO.

France 689,969

**IMPROVEMENTS IN THE MANUFACTURE OF FUEL GAS**

Humphreys & Glasgow, Ltd., England

*June 3, 1930; application filed in Paris Feb. 14, 1930.  
Application filed in the U.S.A. Mar. 2, 1929.*

*Gr. 15, Cl. 3*

Process for the manufacture of fuel gas with a low specific weight, including the following operations: blowing air through a mass of ignited fuel; producing gases obtained from this blowing; reduction of the ferric oxide and heating of the metallic iron by contact with the said gases; production of hydrogen by causing the vapor to pass in contact with the metallic iron, transforming the latter in this way into ferric oxide; production of water gas by injecting vapor through the mass of fuel; and reduction of the specific weight of the water gas by mixing it with hydrogen.

France 690,126

**BOILER WITH VERTICAL PIPES FOR USING LOST HEAT, PARTICULARLY HEAT LOST IN THE PREPARATION OF WATER GAS**

Dampfkesselfabrik, formerly Arthur Rodberg A.G., Germany  
*June 10, 1930; application filed in Paris Feb. 17, 1930.*  
*Application filed in Germany Mar. 23, 1929.*

Gr. 15, Cl. 3

The present invention concerns a boiler with vertical pipes for using lost heat, especially heat lost during the preparation of water gas, the said boiler being characterized by the following features:

(1) The upper body and the lower body are horizontally arranged and the water pipes connecting them are assembled into a cylindrical nest.

France 690,302

**IMPROVEMENTS IN THE PRODUCTION OF MIXTURES OF OIL GAS AND WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain  
*June 16, 1930; application filed in Paris Feb. 20, 1930.*  
*Application filed in the U.S.A. Mar. 2, 1929.*

Gr. 15, Cl. 3

The present invention concerns:

A process for the manufacture of a fuel gas containing water gas and oil gas mixed together, including, when carried out in a generator and a heat-storage receptacle which intercommunicate, the following operations: provision in the generator of a mass of ignited fuel; blowing air into the mass of fuel; the generator, and the receptacle in series, and assuring combustion in the said receptacle of the gases produced by the said blowing of air; simultaneously introducing a fluid hydrocarbon into the generator and introducing another quantity of fluid hydrocarbon into the said receptacle; causing the said fluid hydrocarbon to pass simultaneously in two streams: one stream through the generator and the mass of fuel where the deposit of carbon is effected, and the other stream through the said receptacle; evacuating from the generator and the receptacle the oil gases resulting; injecting steam into the mass of fuel; assuring combustion of the excess carbon deposited in the latter and not burned by air blowing, thus producing water gas, which can be carbureted with a hydrocarbon in the receptacle; and mixing together the three gases which have just been produced.

France 690,356

**IMPROVEMENTS IN PROCESSES FOR THE MANUFACTURE OF FUEL GAS**

Humphreys & Glasgow, Ltd., Great Britain  
*June 17 1930; application filed in Paris Feb. 21, 1930.*  
*Application filed in the U.S.A. May 6, 1929.*

Gr. 15, Cl. 3

The invention concerns a process for the production of a fuel gas for domestic or industrial consumption, in which water gas (blue) is treated for elimination of a sufficient part of its CO content, so as to reduce the ratio between the CO and the hydrogen contained in the blue water gas to an approximate proportion of lower than 1, or less than 1, to 3; and to transform the remaining CO, as well as the hydrogen remaining, into methane, by causing the treated blue water gas to pass onto an appropriate catalyzer, at a high temperature.

France 690,533

**IMPROVEMENTS IN THE MANUFACTURE OF GAS**

Humphreys & Glasgow, Ltd., Great Britain  
*June 23, 1930; application filed in Paris Feb. 25 1930.*  
*Application filed in the U.S.A. May 2, 1929.*

Gr. 15, Cl. 3

The present invention concerns:

(1) A process for the manufacture of fuel gas for

domestic and industrial consumption, consisting of causing blue water gas to pass onto a heated catalyzer appropriate for the transformation of an appreciable part of its hydrogen and CO content into methane, carbon dioxide, and steam; of treating another part of the blue water gas by causing it to pass, with vapor, onto a heated catalyzer appropriate for transforming an appreciable part of its CO into hydrogen and carbon dioxide; of adding the gas produced in the second operation to that produced in the first operation; and of eliminating the CO<sub>2</sub> and the steam, either before, or after the said addition.

France 690,798

**IMPROVEMENTS MADE IN THE MANUFACTURE OF MIXED OIL GAS AND WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain  
*June 30, 1930; application filed in Paris Feb. 28, 1930.*  
*Application filed in the U.S.A. on July 11, 1929.*

Gr. 15, Cl. 3

Process for the manufacture of a hydrocarbon [oil] gas and water gas, mixed together, in an installation including a receptacle intended to contain a mass of ignited fuel, a receptacle containing a re-generation material, and means for extracting tar, including the production of steam in the means for extracting tar and the production of water gas by causing the said steam to pass through the mass of ignited fuel, the quantity of steam admitted being preferably controlled.

France 690,868

**IMPROVEMENTS MADE IN THE MANUFACTURE OF MIXED OIL GAS AND WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain  
*June 30, 1930; application filed in Paris Mar. 1, 1930.*  
*Application filed in the U.S.A. July 11, 1929.*

Gr. 15, Cl. 3

The invention concerns:

(1) A process for the manufacture of a mixture of oil gas and water gas in an installation composed of three receptacles, one of which contains a mass of solid fuel, and the two others containing a heat-storage material; this process including the following operations, consisting of: heating beforehand two of the said receptacles by internal combustion of the gas produced in the third receptacle by blowing air into the mass of fuel; of introducing a hydrocarbon alternately into one and then into the other of the previously heated receptacles; and of causing hydrocarbon to pass through the other previously heated receptacle; of causing at least an appreciable part of the oil gas produced to pass through the mass of fuel; and of extracting the tar from the oil gas before causing the latter to pass through the mass of fuel.

France 693,105

**IMPROVEMENTS IN THE MANUFACTURE OF GAS**

Humphreys & Glasgow, Ltd., Great Britain  
*Aug. 18, 1930; application filed in Paris Apr. 1, 1930.*  
*Application filed in the U.S.A. May 6, 1929.*

Gr. 15, Cl. 3

The present invention concerns:

(1) A process for the manufacture of gas in which steam is made to pass from bottom to top through a mass of incandescent fuel, departing from a point situated sufficiently above the base of the said mass to leave an annular zone of incandescent fuel.

(2) This process consists also of permitting a part of the blue water gas produced in the incandescent fuel to rise through a superposed fuel bed of fresh fuel in order to eliminate the hydrocarbons from it;



of causing another part of the blue water gas to pass into a carburetor; of introducing a hydrocarbon into the blue water gas contained in the carburetor; of introducing the resulting gas into the center of the lower part of the mass of fresh fuel; and of permitting the resulting gas to rise through the mass of fresh fuel.

France 693,289  
GAS GENERATOR  
La Carbonite, France

*Aug. 19, 1930; application filed in Paris July 8, 1929.  
Gr. 15, Cl. 3*

The invention concerns a gas generator system which permits a large variety of operations, the said system including several levels of different diameter hearths, fed by means of orifices which may be alternating, either uncovered, or closed, in part, or totally.

France 693,514  
PROCESS AND APPARATUS FOR THE PRODUCTION OF WATER GAS

Power Gas Corp., Ltd., and Niels Edward Rambush, Great Britain

*Aug. 25, 1930; application filed in Paris Apr. 8, 1930.  
Application filed in England Apr. 23, 1929.  
Gr. 15, Cl. 3*

The present invention concerns:

(1) A process for the production of water gas according to which steam is superheated alternately or simultaneously outside and inside the pipes of a tubular superheater of a gas generator producing water gas, and characterized by the fact that . . . the pipes of a tubular superheater are first of all heated by blown gases, steam next being superheated by sending it into the inside of these pipes during the ascending phase and, next, at the end of that phase, to the outside of the said pipes as well as to the inside of them, preferably until completion of the descending phase.

France 693,722  
APPARATUS FOR THE TREATMENT OF COMBUSTIBLES  
Alfred-Jean-André Hereng, France

*Sept. 2, 1930; application filed in Paris July 18, 1929.  
Gr. 15, Cl. 3*

The present invention concerns:

(1) An apparatus for the treatment of fuels with the object being their transformation into useful gaseous products, this apparatus being characterized by the combination of the following elements:

(a) A vertical shaft for receiving the fuel to be treated, this shaft being arranged inside a vertical chamber for the evacuation of the gases supplied by the gasification of the fuel treated in the apparatus, this shaft being open, at the lower part, into the said vertical chamber and being equipped, at the upper part, with a pipe for evacuating the products released in the said shaft.

(b) A horizontal chamber for gasification of the fuel, this chamber receiving the fuel emerging from the aforementioned vertical chamber.

(c) A horizontal endless conveyer for the sweeping along of the said fuel, this conveyor being gas permeable, and serving simultaneously as a base for the aforementioned shaft and as a base for the horizontal chamber for gasifying the fuel, and being combined with the devices situated above its upper end.

France 696,052  
REGENERATOR FOR GAS OVEN OF GAS GENERATOR  
Jean Sauvageot and Henry Dieterlen, France

*Oct. 7, 1930; application filed in Paris May 24, 1930.  
Gr. 15, Cl. 3*

The invention concerns a regenerator, of metal or

otherwise, reheating only or principally primary air, with one or several water inlets being provided for in the circuit of reheated air; the water is vaporized and superheated and the superheated air and vapor are sent into the gas generator at a high temperature.

France 696,082  
IMPROVEMENTS MADE IN THE MANUFACTURE OF GAS  
Humphreys & Glasgow, Ltd., and Arthur Robert Griggs, Great Britain

*Oct. 7, 1930; application filed in Paris May 24, 1930.  
Application filed in England Apr. 8, 1930.  
Gr. 15, Cl. 3*

The present invention concerns:

(1) The manufacture of gas by a process of complete gasification, of the type in which hot gaseous fluids, produced in the manufacture of water gas with the aid of coke, are sent through coal, and the gases produced by the injection of air are withdrawn from the coke without passing through the coal, and are used to heat a regenerator chamber encircling the chamber or retort containing the coal, in such fashion that the heat conducted through the wall facilitates carbonization of the coal; and in which steam is superheated by passing through the said regenerator chamber in a direction contrary to the [natural] direction of movement, through that chamber, of the gases produced by the injection of air, the said steam being next used to be injected into the coke, with a view to the production of water gas which is made to pass from bottom to top through the coal to facilitate its carbonization.

France 696,696  
PROCESS AND APPARATUS FOR THE DISTILLATION AND GASIFICATION OF BITUMINOUS FUELS IN GENERATORS OPERATING ON AN ALTERNATING BASIS

Compagnie Continentale pour la Fabrication des Compteurs et Autres Appareils and Albert Breisig, France

*Oct. 20, 1930; application filed in Paris June 5, 1930.  
Application filed in Austria June 5, 1929.  
Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the distillation and the gasification of bituminous fuel in alternately functioning generators with regeneration of the distillates forming during the period of blowing, characterized by the fact that the distillation products which form during the period of blowing in the retort are deviated toward the gas holder while passing through a fuel bed appropriately arranged in the distillation space and drawn off by the influence of sweeping gases used for distillation, in such fashion that the volatile hydrocarbons of the distillation are condensed onto the fuel bed and are cracked with the low-temperature tars which form during the subsequent distillation of this fuel bed.

France 697,489  
IMPROVEMENTS MADE IN PROCESSES FOR THE PRODUCTION OF WATER GAS WHICH IS LOW IN CARBON MONOXIDE OR FREE OF CARBON MONOXIDE, AND FOR THE SEPARATION OF CARBON MONOXIDE FROM THE WATER GAS OR FROM GASEOUS MIXTURES OF AN ANALOGOUS COMPOSITION

Oesterreichisch Amerikanische Magnesit A.G., Austria  
*Nov. 4, 1930; application filed in Paris June 16, 1930.  
Application filed in Austria June 18, 1929.  
Gr. 15, Cl. 3*

The invention concerns improvements made in processes for the production of water gas low in car-

bon monoxide or free of carbon monoxide, and for the elimination of carbon monoxide from the water gas or from gaseous mixture of an analogous composition consisting, principally:

(1) Of a process for the production of water gas by the action of steam on coal or on carbonaceous materials in the presence of catalyzers, the said process being characterized by the fact that the direct catalytic production of mixtures of hydrogen and carbon dioxide low in CO or free from CO, is effected by contact with a mixture of oxide, hydroxide or carbonate of magnesium at a temperature which is higher than the temperature of dissociation of the carbonate of magnesium, but at the same time not substantially exceeding 750° C.

France 698,590

IMPROVEMENTS IN GAS GENERATORS AND SIMILAR APPARATUS

Charles Whitfield, England

Nov. 28, 1930; application filed in Paris July 2, 1930. Two applications filed in England Aug. 3, 1929, and

Jan. 1, 1930  
Gr. 15, Cl. 3

The invention concerns:

(1) A process for regulating the combustion of fuel arranged on a grate, to which the air of the combustion is supplied to small separate sections of the grate through distribution chambers permitting it to have relatively free access to the fuel, and according to which the arrival of air in each chamber is separately and proportionately reduced in such fashion that the volume of air admitted at any given time shall not exceed that necessary, under normal operating conditions, for producing the proportion of carbon monoxide to be extracted from the carbon content of the fuel . . . further characterized by the fact that . . . the total resistance of the air supplied by reduction regulation is higher than the resistance of the fuel bed . . . and that the admission of air into each chamber is separately regulated by an opening equal at the most to one-third of the cross section of the grate.

France 698,891

PROCESS FOR COOLING INCANDESCENT COAL

N.V. Silica en Ovenbouw Mij., Netherlands

Nov. 29, 1930; application filed in Paris July 12, 1930  
Gr. 15, Cl. 3

The invention concerns a process for cooling incandescent coke, by introducing water or saturated water vapor acting as a cooling agent, circulating counter-current with respect to the coke, with simultaneous production of superheated steam, characterized by the fact that:

(a) For the purpose of avoiding the creating of water gas at all points of the cooling installation, the cooling agent is given a speed of circulation exceeding the speed of reaction, the speed of circulation in the part of the cooling installation where the coke is still at a temperature higher than the temperature of dissociation of the steam, being introduced at the value [of temperature] necessary, owing to the fact that a portion of the flux of the steam escaping from the cooling installation is reconducted into that part of the cooling installation, in closed circulation, by means of a blowing device, ventilator, or other similar device, and at an appropriate speed.

France 699,069

PROCESS FOR THE SEPARATION OF A GASEOUS MIXTURE USEABLE WITH GASEOUS COMPOUNDS STILL DISSOLVED IN WATER UNDER PRESSURE USED FOR THE WASHING OF COKING GAS, OF WATER GAS AND OF OTHER MIXTURES OF GAS, OR ALREADY EXPANDED  
Patentverwertungs A.G., Alpina (S.A. pour l'Exploitation de Brevets), Switzerland

Dec. 8, 1930; application filed in Paris July 17, 1930. Application filed in Germany July 20, 1929.

Gr. 15, Cl. 3

The invention concerns a process of separation of a gaseous mixture useable with gaseous compounds still dissolved in water for washing coking gases, water gas, and similar gaseous mixtures, the said water being already expanded, notable chiefly for the fact that the wash water, after its expansion to atmospheric pressure, is traversed by a current of gas at pressure lower than atmospheric pressure, the water being preferably previously conducted in a device where a low pressure prevails, and equipped with impact surfaces.

The wash water, below atmospheric pressure, is traversed by the gaseous elements which, during the decomposition under pressure of the scrubbed gas, are separated in the form of a nonuseable fraction, as a result of their high nitrogen content.

France 699,128

IMPROVEMENTS IN THE PROCESS OF CATALYZATION OF CARBON MONOXIDE ON WATER GAS

Panstwowa Fabryka Zwlasków Azotowych W Moscicach (Usine d'Etat de Produits Azotés à Moscice), Poland. State Plant for Nitrogenous Products, Moscice, Poland

Dec. 8, 1930; application filed in Paris July 18, 1930

Gr. 15, Cl. 3

The invention concerns improvements in the process of catalyzation of carbon monoxide, the objective of which is the lowering of the quantity of carbon monoxide contained in water gas, the said improvements consisting of applying the reaction CO plus H<sub>2</sub>O equals CO<sub>2</sub> plus H<sub>2</sub> to the gas emerging directly from the generator, this gas being at a temperature sufficient, and containing a quantity of steam sufficient, to permit the achieving of the reaction without the heat-exchanger apparatus and without addition of any steam or with the addition of a very limited quantity of steam.

France 699,681

IMPROVEMENTS IN GAS GENERATORS

Frederick Joseph West, Ernest West, and West's Gas Improvement Co., Ltd., Great Britain

Dec. 16, 1930; application filed in Paris July 28, 1930. Application filed in England Aug. 1, 1929.

Gr. 15, Cl. 3

The present invention consists of a gas generator characterized by the fact that:

(1) It includes a grate formed of several bars and having a rectangular shape, the said grate being placed inside a cylindrical jacketing gas generator;

(2) The upper surface of each of the aforementioned bars has an in-curved shape;

(3) Each bar is equipped with relatively long and deep notches arranged a short distance apart from each other and extending toward the interior departing from the opposite edges of the aforementioned in-curved surface;

(4) The notches in any one bar are arranged facing the unnotched parts of the adjacent bars;

(5) The bars are mounted in such fashion as to be able to pivot on moveable swivels, and they include projections which become engaged in the notches made in a shaft which can have a to-and-fro motion, in order to make all the bars oscillate at the same time;

(6) Canals are arranged in the bars for the passage of air and (or) steam, blast orifices arranged on the opposite sides of each bar being provided for the introduction of steam around the bar.

France 700,081

DEVICE FOR FACILITATING POKING IN GAS GENERATORS

Compagnie Générale des Gazogènes Imbert, France  
Dec. 22, 1930; application filed in Strasbourg on Aug. 5, 1930.

Gr. 15, Cl. 3

The invention concerns:

A device for facilitating hot or cold poking of gas generators, characterized by the fact that it is composed of a deformable screen inserted in an ad hoc slit of the wall of the gas generator, a slit ordinarily closed by a sliding or rotating register, or by any other appropriate medium.

France 700,220

IMPROVEMENTS IN GAS GENERATORS

Colin-Jurion, France

Dec. 22, 1930; application filed in Paris Aug. 8, 1930.

Gr. 15, Cl. 3

This invention concerns improvements made in gas generators and characterized particularly by the fact that:

(1) A rack traversing a receiving vessel assures the dissemination of air arriving in the fuel contained in this receiving vessel;

(2) According to one method of putting the invention into effect, evacuation of the slag can be effected by continuous or alternating movement of the support or supports of the spent fuel.

France 700,929

IMPROVEMENTS IN THE MANUFACTURE OF OIL GAS AND WATER GAS MIXED TOGETHER

Humphreys & Glasgow, Ltd., England

Jan. 5, 1931; application filed in Paris Aug. 21, 1930.

Application filed in the U.S.A. Sept. 3, 1929.

Gr. 15, Cl. 3

The invention concerns a process for the production of gas with the aid of liquid hydrocarbons, as carried out in an installation including a generator containing a mass of fuel and a receptacle containing a refractory mass, this process consisting of introducing a liquid hydrocarbon into the receptacle in such fashion as to gasify it; of causing the gas resulting therefrom to pass through the fuel bed; and of dissociating it, thus determining the deposit of carbon; of blowing air into the mass of fuel; and of introducing, simultaneously, steam into the mass of fuel in order to form blue water gas; and of burning in the receptacle the blue water gas and the gases produced by the blowing of air.

France 701,312

IMPROVEMENTS IN THE MANUFACTURE OF OIL GAS AND WATER GAS

Humphreys & Glasgow, Ltd., Great Britain

Jan. 7, 1931; application filed in Paris July 22, 1930.

Application filed in the U.S.A. July 27, 1929.

Gr. 15, Cl. 3

The invention concerns the manufacture of gas in a unit of apparatus consisting of two gas generators adapted to contain fuel beds and a superheater containing heat-regenerative material, in the following cycles: blowing of air on the fuel beds to the point of incandescence; burning of the gases and blowing with air and storage of the heat in the gas generators and in the superheater; introduction of heavy oil above the fuel bed in one of the gas generators, and intro-

duction of steam in the lower part of the fuel bed in the same, then passage of the resulting gas partly through the fuel bed of the first gas generator, and partly through the superheater.

France 701,313

PROCESS AND APPARATUS FOR THE USE OF HEAVY OIL IN THE MANUFACTURE OF CARBURETED WATER GAS

Humphreys & Glasgow, Ltd., England

Jan. 7, 1931; application filed in Paris July 22, 1930.

Application filed in the U.S.A. July 27, 1929.

Gr. 15, Cl. 3

The present invention concerns:

(1) An apparatus for the use of heavy oil in the manufacture of carbureted water gas, including: a gas generator adapted to contain a fuel bed; a carburetor; means for producing a sudden change in the direction of flow of the gas through the carburetor; a superheater; means of admitting blowing air (secondary air) to the carburetor; means of admitting heavy oil to the carburetor; means of providing an intake for gas from the base of the gas generator and from the top of the superheater, the said carburetor being equipped, at its base and below the region of changing direction of the flow of gas, with means for supporting a lighted fuel bed.

France 701,598

DEVICE FOR THE USE OF STEAM IN INSTALLATIONS PRODUCING WATER GAS AND OPERATING IN AN INTERMITTENT FASHION

Julius Pintsch A. G., Germany

Jan. 12, 1931; application filed in Paris Sept. 2, 1930.

Application filed in Germany Sept. 11, 1929.

Gr. 15, Cl. 3

The present invention concerns the use of steam in water-gas installations operating in an intermittent fashion; it includes the following characteristics:

(a) The steam available is used completely during the blowing period, in the machine activating the blowing, but incompletely expanded, on the other hand, in the latter, during the period of gas production, and is reused for the production of gas.

(b) A two-level steam turbine is used during blowing, which is fed, at the first level by steam under high pressure, and at the second level by steam under low pressure, and operation by exhausting or by condensation; whereas, during manufacture of the gas, the first level is also activated by live steam, while the second operates empty.

(c) The live steam is borrowed from a thermic regenerating boiler of the water-gas installation.

(d) The low-pressure steam is borrowed from a steam jacketing of the water-gas generator.

France 702,884

IMPROVEMENTS IN GAS GENERATORS AND IN THEIR METHOD OF CONDUCTION

James Alexander MacDonald, Great Britain

Feb. 2, 1931; application filed in Paris July 2, 1930.

Application filed in England July 29, 1929.

Gr. 15, Cl. 3

The invention covers the existence, in a gas generator, of a combustion chamber of ample volume, of an air-introduction pipe with a small diameter extending inward into the chamber in the neighborhood of the lower part of the said pipe and intended to create at its outlet extremity or in the neighborhood thereof a zone of incandescence of limited volume and of high temperature, and a device for projecting water onto the said zone of incandescence in such fashion as to submerge the lower part of the chamber.

France 703,560  
GAS GENERATOR

Svan Carl Gunnar Ekelund, Sweden

Feb. 9, 1931; application filed in Paris. Oct. 10, 1930.  
Gr. 15, Cl. 3

The invention concerns:

(1) A discharge gas producer characterized by the fact that it includes a combination of a shaft equipped with a fusion crucible at the bottom of a reheating chamber; a reservoir of fuel in communication with that chamber; and a system of gas circulation connected to the shaft and to the chamber.

(2) The gas generator is characterized further by the fact that . . .

(a) The reservoir is directly assembled to the chamber and forms an upward extension of that chamber;

(b) The reservoir communicates with the chamber by means of a conveyor screw;

(c) A device has been provided for the reservoir for charging fuel, with a gas-tight closure;

(d) The charging device is composed of an opening made in the top and closed by a lid; . . . etc.

France 705,144

IMPROVEMENTS IN THE PRODUCTION OF CARBURETED WATER GAS

Humphreys & Glasgow, Ltd., Great Britain

Mar. 3, 1931; application filed in Paris Nov. 5, 1930.  
Application filed in the U.S.A. Nov. 20, 1929.

Gr. 15, Cl. 3

The invention concerns a process for the production of carbureted water gas consisting of blowing air into a mass of ignited fuel, as well as into its upper part, in order to store there the heat in a refractory body located inside the mass of fuel and arranged so as to transmit the heat by radiation to the upper part of the mass of fuel; of causing the steam to pass from bottom to top through the said mass of fuel in order to produce water gas; of simultaneously injecting atomized oil yielding a high quantity of coke, in the upper part of the mass of fuel; of vaporizing this oil by the heat stored in the upper part of the mass of fuel, by means of the heat radiated by the said refractory body, and by the sensible heat of the water gas traversing the upper part of the mass of fuel; and of evacuating the combined water gas and oil vapors.

France 705,815

PROCESS FOR THE CONTINUOUS MANUFACTURE OF PRODUCER GAS OF HIGH CALORIFIC VALUE

Karl Koller and Zsigmond van Gálócsy, Hungary

Mar. 17, 1931; application filed in Paris Nov. 17, 1930.  
Application filed in Hungary Nov. 28, 1929.

Gr. 15, Cl. 3

The invention concerns a process for the manufacture of producer gas with high calorific value on a continuous-operation basis, characterized by the fact that the manufacture of the producer gas takes place in two separate operations—namely: in the first operation a solid, liquid, or gaseous fuel is burned in a combustion space independent of the gas generator properly speaking, but connected to that gas generator, with oxygen, air, or air enriched with oxygen; and the combustion gases are mixed with saturated water vapor or superheated steam, and if necessary with carbonic acid, this steam being superheated to the temperature of the gases of combustion, and next the mixture of combustion gases and superheated steam, as well as possibly the surplus oxygen, is conducted through the column of incandescent coal of a gas generator with liquid slag, which produces the mixture of carbon monoxide and hydrogen.

France 706,041

PROCESS FOR THE PRODUCTION OF CARBURETED WATER GAS

Humphreys & Glasgow, Ltd., Great Britain

Mar. 23, 1931; application filed in Paris Nov. 7, 1930.  
Application filed in the U.S.A. Nov. 20, 1929.

Gr. 15, Cl. 3

The invention concerns a process for the production of carbureted water gas in which a mass of fuel is kept in ignition by an appropriate blowing of air; the gases resulting from this blowing of air are burned with air and their heat is stored in one or several chambers; the blue water gas is produced by injecting steam into the mass of fuel in ignition; and the blue water gas is carbureted by oil producing high quantities of coke, introduced into the upper part of the mass of fuel, and by oil producing slight quantities of coke, introduced into the heat-storage chamber or chambers.

France 706,042

IMPROVED PROCESS FOR THE PRODUCTION OF CARBURETED WATER GAS

Humphreys & Glasgow, Ltd., Great Britain

Mar. 23, 1931; application filed in Paris Nov. 7, 1930.  
Application filed in the U.S.A. Nov. 21, 1929.

Gr. 15, Cl. 3

The present invention concerns:

(1) A process for the production of carbureted water gas in a generator intended to contain a mass of ignited fuel, this process consisting: of blowing air into the mass of fuel contained in the generator; of storing the heat from the gases resulting from this blowing of air in one or several apparatus for regeneration, permitting them to burn there with secondary air; of blowing air into the mass of fuel; and of simultaneously introducing oil into the upper part of the mass of fuel; of causing the gases resulting to pass into the apparatus for regeneration; and of next sending them to a storage point.

France 706,341

IMPROVEMENTS IN GAS GENERATORS OR PRODUCERS EQUIPPED FOR MECHANICAL SLAG REMOVAL

Humphreys & Glasgow, Ltd., and Arthur Robert Griggs, Great Britain

March 30, 1931; application filed in Paris Nov. 25, 1930. Application filed in England Aug. 12, 1930

Gr. 15, Cl. 3

The present invention concerns:

(1) A gas generator or producer with mechanical slag removal, in which the wall of the fuel chamber, at the place where it surrounds the crushing zone, is constituted of a series of plates in part circular, spaced a little apart from each other, arranged according to a circular layout and including parts which extend externally, butting against an exterior dome and attached, for example by rivets or bolts, to an exterior dome, the arrangement being such that the plates which are in contact with the slag and the hot ashes are kept spaced away from the said dome by an intermediate air or gas space, in such fashion that their organs of attachment are in contact with the hot fuel or are subjected to the abrasive action of the slag or ashes.

2. The said plates are chamfered at their ends.

France 707,230

IMPROVEMENTS MADE IN THE MANUFACTURE OF MIXED HYDROCARBON AND WATER GAS

Humphreys & Glasgow, Ltd., Great Britain

April 13, 1931; application filed in Paris Dec. 8, 1930.  
Application filed in the U.S.A. on Dec. 19, 1929.

Gr. 15, Cl. 3

The invention concerns a process for the manufac-

ture of mixed hydrocarbon gas and water gas, in which the reformed hydrocarbon gas is produced by dissociating, in a mass of ignited fuel, hydrocarbon gas coming from an outside source; and water gas is produced by injecting steam in the mass of fuel, these gases being sent into one or several carburetion receptacles, and at least a part of the gas is carbureted with oil, in such fashion that the thick, hard pitch coming from the hydrocarbon gas is mixed with fluid tar coming from the carburetion oil, this mixture being easily removable by scrubbers or other accessory apparatus.

France 708,527

**IMPROVEMENTS IN INSTALLATIONS FOR THE PRODUCTION OF WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain

May 4, 1931; application filed in Paris Dec. 29, 1930.  
Application filed in England Apr. 7, 1930.

Gr. 15, Cl. 3

The invention concerns:

(1) An installation for the production of water gas characterized by the fact that the ash-evacuation door of the generator is provided with bolting means which cannot be unbolted so as to let the door be opened unless the operation of the installation is halted and the outlet orifice emptying into the main pipe is appropriately closed, other means of bolting being also provided to prevent the automatic control device from being put into operation, unless the ash-evacuation door is closed and the outlet orifice emptying into the main pipe is open.

France 708,931

**DEVICE FOR DETERMINING BY ESTIMATING THE TEMPERATURE AND THE HEIGHT OF THE SLAG LAYER IN GAS GENERATORS**

Carl Morischka, Austria

May 5, 1931; application filed Jan. 7, 1931 in Paris.  
Application filed in Austria Jan. 7, 1930.

Gr. 15, Cl. 3.

The invention concerns a device for the determining by estimating the temperature and height of the layer of slag in gas generators, characterized by a hollow chamber arranged along the periphery of the gas generator shaft in the neighborhood of the grate, and including an inlet orifice and a discharge orifice in the same opening for a cooling liquid arriving in a constant quantity and at a constant temperature, and the temperature of which upon leaving the hollow chamber serves as a measure to indicate the thermic condition of the slag on the periphery of the gas generator in the vicinity of the grate and consequently also to determine the height of the layer of slag in this part of the cross section of the gas generator.

France 709,219

**PROCESS AND EQUIPMENT INTENDED FOR THE PRODUCTION OF A GAS WITH A LOW CARBON MONOXIDE CONTENT**

Compagnie Continentale pour la Fabrication des Compteurs et autres Appareils, and Jules Freyss, France

May 11, 1931; application filed in Paris Apr. 12, 1930.

Gr. 15, Cl. 3

The invention concerns:

(1) A process for the production of water gas with a low carbon monoxide content, by means of alternately functioning generators, characterized by the fact that the water gas, produced at the beginning of the gasification period, is stored in order to next be mixed and burned with the blowing gases during the course of the subsequent blowing cycle; the heat thus liberated

being used, for example, for the production of the steam necessary for the gasification, while the gas produced at the end of the gasification cycle and having a low CO content is supplied for consumption, either alone, or mixed with another gas.

France 710,117

**GAS GENERATOR**

I. G. Farbenindustrie A. G., Germany

June 1, 1931; application filed in Paris Jan. 29, 1931.

Application filed in Germany Feb. 1, 1930.

Gr. 15, Cl. 3

The invention concerns a gas generator for the continuous gasification of granular fuel, including, if necessary, dust, containing in its lower part one or several draft-distribution chambers having the shape of funnels and equipped with ejectors and, alongside the funnels, collector vessels communicating by gasification ducts equipped with steam pipes which open out there tangentially or centrally or in both directions at once, with lower collector vessels, from which point the fuel is exhausted and once more projected upward through the funnels.

France 710,862

**PROCESS AND APPARATUS FOR COMPLETE OR PARTIAL GASIFICATION OF COAL AND OTHER CARBONACEOUS MATERIALS**

Archibald Alexander Macintosh, Australia

June 16, 1931; application filed in Paris Jan. 19, 1931.

Application filed in Australia Jan. 20, 1930.

Gr. 15, Cl. 3

The invention concerns a gaseous product obtained by the mixture of coal gas with producer gas and water gas.

The invention also concerns an installation for the obtaining of the said gaseous product, characterized by the arrangement of one or several control or regulator apparatus between a retort and a gas generator.

The said installation is also characterized by the fact that . . . it combines with a gas retort and a gas generator associated with that retort, an apparatus for controlling the pressure of the gas.

The invention also concerns a process for obtaining the said gaseous product, characterized by . . . the fact that the producer gas of the gas generator is scrubbed with the aid of an ammonium liquid before and after mixture with the coal gas.

France 712,479

**PROCESS FOR THE PRODUCTION OF HEAVY GAS AND BYPRODUCT BY OXYGEN GASIFICATION UNDER HIGH PRESSURE**

Metallgesellschaft A. G., Germany

July 21, 1931; application filed in Paris Mar. 2, 1931.

Four applications filed in Germany on Mar. 10, May 15, July 5, and Aug. 2, 1930

Gr. 15, Cl. 3

The invention concerns a process and device for the production of heavy gas and possibly of liquid hydrocarbons by gasification of bituminous fuels or residue of dry distillation, characterized by the fact that . . . gasification is effected under high pressure, using a gasification agent composed of oxygen or air enriched with oxygen and abundant quantities of steam; and that . . . to the gasification agent steam is added in such quantities that the gasification reaction is produced at temperatures from 600 to 900° C. and that the carbon gasified is transformed for the most part into carbon dioxide.

France 714,880

**PROCESS AND INSTALLATION FOR THE MANUFACTURE OF WATER GAS**

The Power Gas Corporation, Ltd., Niels Edward Rambusch, and James Mackay Ballingall, England

*Sept. 14, 1931; application filed in Paris Mar. 27, 1931. Application filed in England Apr. 26, 1930.**Gr. 15, Cl. 3*

The invention concerns a process for the manufacture of water gas containing nitrogen in a regulated quantity, this process being characterized by the fact that a water gas generator is alternately blown with air and a mixture of steam and air, the quantity of air contained in the mixture of steam and air being regulated in accordance with the characteristics (pressure, volume, or flow) of the gas coming out of the installation.

France 716,280

**GAS GENERATOR FOR THE MANUFACTURE OF CARBURETED WATER GAS**

Main-Gaswerke A.G. and Ernst Schumacher, Germany

*Oct. 6, 1931; application filed in Paris Apr. 29, 1931.**Gr. 15, Cl. 3*

The invention concerns a gas generator for the manufacture of carbureted water gas, including the following characteristic features:

(1) The lower part of the shaft operates separately in the form of a continuously operating gas generator for heating, and the gas produced is introduced in turn into special production shafts and serves to periodically and directly heat these shafts.

France 716,343

**IMPROVEMENTS IN THE MANUFACTURE OF GAS**

Humphreys &amp; Glasgow, Ltd., Great Britain

*Oct. 6, 1931; application filed in Paris Apr. 30, 1931.**Application filed in the U.S.A. Apr. 30, 1930.**Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the production of gas rich in hydrogen, consisting of blowing air periodically into a mass of ignited fuel; of controlling the temperature of the mass of fuel; of causing hydrocarbon gases to pass through the said mass and of transforming them into carbon and into dissociated gas formed principally of hydrogen and of methane, the temperature of the mass of fuel being controlled in such fashion that the methane contained in the hydrocarbon gases as well as the methane formed by the initial decomposition of higher hydrocarbons shall be decomposed by contact with the surface of the fuel rather than in the mass of gas, in such fashion that practically all the carbon released shall be retained on the surfaces of the fuel in order to be used subsequently.

France 716,775

**IMPROVEMENTS IN THE PRODUCTION OF WATER GAS AND OF COAL GAS**

Humphreys &amp; Glasgow, Ltd., Great Britain

*Oct. 12, 1931; application filed in Paris May 8, 1931.**Application filed in England Mar. 32, 1931.**Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the production of water gas and coal gas starting with coal or from an equivalent raw material, by means of total gasification, characterized by the fact that steam which has been superheated is made to pass in the chamber or chambers of regeneration, and then to traverse the fuel bed, first in an injection intercalated in an independent circuit connecting the top of the carbonization chamber or the

gas-outlet pipe of that chamber, to one of the regeneration chambers or to the gas-outlet pipe of that chamber, the circulation of gas thus obtained being sufficient to assure complete and effective carbonization of the coal without any more steam than is normally required for the gas-generation phase during which the reintegration of the gas into circulation can be effected.

France 718,013

**PROCESS FOR THE PRODUCTION OF A FUEL GAS AND FOR THE PURIFICATION OF THAT GAS**

William Wallace Odell, U.S.A.

*Oct. 26, 1931; application filed in Paris June 1, 1931**Gr. 15, Cl. 3*

The present invention concerns a process for the production of a fuel gas and for the purification of this gas, which is intended to be used in ordinary combustion apparatus.

Among other objectives, the invention is intended to:

(1) Raise the productive capacity in gas of a coal-carbonization unit, such as a vertical retort;

(2) Produce a low-density gas with a high hydrogen content;

(3) Render possible the most flexible use of a coal-carbonization unit in the production of manufactured gas;

(4) Use hydrocarbon gasses and (or) hydrocarbon fogs in an improved process for the manufacturing of water gas in coal carbonizers;

(5) Use heavy oils and hydrocarbon compounds effectively, even when the carbon-hydrogen ratio is high.

France 719,662

**PROCESS FOR THE OBTAINING OF A MIXED GAS, FORMED FROM DISTILLATION GAS AND WATER GAS, IN OVENS PRODUCING GAS AND COKE, WITH SIMULTANEOUS USE OF LOW-VALUE FUEL**

Dessauer-Vertikal-Ofen-G.m.b.H., Germany

*Nov. 23, 1931; application filed in Paris July 6, 1931.**Application filed in Germany July 30, 1930.**Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the obtaining of a mixed gas formed of distillation gas and water gas in ovens serving to produce gas and coke with simultaneous use of low-value fuel, characterized by the fact that the gases from the distillation of the coal and the water gas produced by means of the low-value fuel meet with their formation heat in a mixing chamber which is maintained by external heating at a temperature (400° to 500° C.) included between the condensation temperature and the temperature for cracking heavy hydrocarbons of the distillation gases.

France 720,307

**PROCESS FOR THE CONTINUOUS MANUFACTURE OF RICH GASIFICATION [GAS]**

Union Chimique Belge (Société Belge), Belgium

*Dec. 3, 1931; application filed in Paris Oct. 16, 1930.**Gr. 15, Cl. 3*

The present invention consists of carrying out the gasification of various fuels [to obtain] a rich gasification gas (1,000 to 3,000 calories or higher) by a continuous process consisting of introducing into the gas generator a mixture of oxygen and nitrogen rich in oxygen and the oxygen content of which is kept constant by a given calorific value of the gas produced, and steam, the quantity of which is regulated in such fashion that the temperature resulting from the reactions in the gas generator never exceeds that obtained by ordinary gasification by moist air. The oxygen content of the mixture can be regulated according to the calorific value of the gas which it is desired to obtain.

France 721,943

**DEVICE SERVING TO REMOVE THE INJURIOUS CARBON MONOXIDE FROM WATER GAS, DILUTED GAS, AND SIMILAR GASES**

Franc Herglotz, Austria

*Dec. 23, 1931; application filed in Paris Aug. 25, 1931.  
Application filed in Austria Aug. 26, 1930.*

Gr. 15, Cl. 3

The invention consists of a device for removing injurious carbon monoxide from water gas, diluted gas, or similar gas, by passage of a mixture of the gases with superheated steam into a receptacle filled with pieces of steel or other heat-resistant bodies and which bodies are externally heated, the said device being characterized by the fact that the receptacle in the form of a pipe is arranged axially in the gas generator and is connected to the upper chamber of the gas generator where the gas is collected, in such fashion that the crude gas comes out of this chamber and descends into the receptacle as far as the lower part of the generator, and from there passes to the outside.

France 722,308

**PROCESS AND INSTALLATION FOR THE GASIFICATION OF FINELY DIVIDED FUELS**

Franz Herzberg, Germany

*Dec. 29, 1931; application filed in Paris on Nov. 25, 1930.  
Gr. 15, Cl. 3*

The invention concerns a process for the gasification of liquid or solid finely divided fuels, in the state of dust, characterized by the fact that the fuel is subjected to continuous gasification in a chamber having the dimensions of a coke oven chamber, heated externally by heating ducts, the said gasification taking place with or without vapor, the fuel being, if necessary, burned in part, in such fashion that only the gas and the ashes leave the oven.

France 722,644

**GENERATOR OF NITROGEN-FREE FUEL GAS**

Léon Leibovici, France

*Jan. 4, 1932; application filed in Paris Aug. 29, 1931.  
Gr. 15, Cl. 3*

The invention concerns an apparatus consisting of an externally heated gas generator with a grate and in which the oxygen necessary for combustion is introduced, not by air, but by steam.

The apparatus includes . . . a retort: a metal receptacle which is closed and divided into two compartments by a grate. In the upper compartment, the coal is placed; a door which is impermeable permits this operation. In the lower compartment, the residues of the operation fall; a tight door makes it possible to extract them from it.

France 723,081

C. Otto &amp; Cop. G.m.b.H., Germany

**PROCESS FOR THE PRODUCTION OF CARBURETED WATER GAS**

*Jan. 12, 1932; application filed in Paris Aug. 17, 1931.  
(Two applications filed in Germany Sept. 22, 1930,  
and Feb. 13, 1931.)*

Gr. 15, Cl. 3

The invention concerns a process for coking coal in the chambers of an oven operating continuously, by the introduction of tar or a mixture of tars and vapor in the chambers and the decomposition of these substances with the incandescent content of the chamber, as well as an oven chamber for putting this process into practice . . . characterized by the fact that (a) the tar or the mixture of tar and vapor are atomized and passed over the incandescent surface of the rather

completely distilled contents of the chamber, and the extraction of the gas by aspiration takes place in such fashion that the substances to be decomposed will be forced to traverse a considerable passage through the layer of coke.

France 723,109

**IMPROVEMENTS IN THE MANUFACTURE OF CARBURETED WATER GAS WITH A LOW SPECIFIC WEIGHT**

Humphreys &amp; Glasgow, Ltd., England

*Jan. 12, 1932; application filed in Paris Aug. 29, 1931.  
Patent filed for in the U.S.A. Sept. 10, 1930.*

Gr. 15, Cl. 3

The present invention concerns a process for the production of carbureted water gas with a low specific weight, characterized by the fact that:

(1) Air is blown into a mass of fuel contained in a generator, the gases thus produced are burned with secondary air in contact with the upper part of the mass of fuel, the heat from their combustion is partially stored in the generator and partially in a carburetion apparatus, and the steam and the hydrocarbon are sent through the mass of fuel, producing blue water gas and dissociating the hydrocarbon.

France 724,316

**IMPROVEMENTS IN THE MANUFACTURE OF GAS**

Humphreys &amp; Glasgow, Ltd., and Arthur R. Griggs, England

*Jan. 25, 1932; application filed in Paris Aug. 11, 1930.  
Application filed in England May 6, 1930.*

Gr. 15, Cl. 3

The invention, which concerns the process of complete gasification which is the subject of French Patent 599,598 of May 28, 1925, is essentially characterized by:

(1) The use of blowing gases to heat a regeneration chamber encircling the chamber for carbonization of the coal and thus aid in carbonizing the said coal.

(2) The establishment through the coke of an injection in a descending direction of vapor superheated in a regeneration chamber encircling the coal-carbonization chamber and which has been heated by the gases coming from blowing.

(3) The burning in a regeneration chamber encircling the coal-carbonization chamber of a part of the blue-water gas produced during a previous production period.

(4) The apparatus for carrying out such a complete gasification.

France 724,749

**IMPROVEMENTS IN THE MANUFACTURE OF CARBURETED WATER GAS**

Humphreys &amp; Glasgow, Ltd., U.S.A.

*Jan. 30, 1932; application filed in Paris Oct. 19, 1931.  
Application filed in the U.S.A. on Nov. 23, 1930.*

Gr. 15, Cl. 3

The invention concerns a generator intended to be used in the manufacture of carbureted water gas, including a casing intended to contain a mass of fuel, a device for introducing secondary air to the periphery, in the proximity of the upper part of the fuel mass, a device for introducing secondary air to the center of the upper part of the fuel mass, and a device for projecting oil into the area above the latter.

France 727,523

**PROCESS AND GAS GENERATOR FOR THE GASIFICATION OF COKE IN SMALL PIECES**

Le Gaz Industriel, France

*Mar. 29, 1932; application filed in Paris Nov. 13, 1931.  
Gr. 15, Cl. 3*

The invention concerns a process for the gasification of coke fines—that is, of a mixture of fine coke screenings and coke dust—in gas generators, characterized

by the fact that the charging hopper is fed by successive layers of dust and screenings, and that the dust is directed toward the center of the gas generator; [and] . . . a gas generator for carrying out the aforementioned process . . . characterized by the fact that the outside wall of the charging hopper is extended to the inside of the gas generator as far as below the gas-outlet piping, and that inside this cylinder, there is a second cylinder around a conical shutter, below which there is, at a certain distance, a third cylinder with a larger diameter.

France 727,778

**IMPROVEMENTS IN THE MANUFACTURE OF FUEL GAS**

Humphreys and Glasgow, Ltd., England

*Apr. 4, 1932; application filed in Paris Oct. 21, 1931.*

*Application filed in the U.S.A. Nov. 28, 1930.*

*Gr. 15, Cl. 3*

The present invention concerns a fuel-gas generator including a casing intended to contain a mass of ignited fuel and the lower part of the wall of which is constituted by a metal jacketing in which the said jacketing contains a liquid with a higher boiling point than that of water and which is made to circulate through the said jacketing; and a heat exchanger containing a water-admission pipe and a steam-evacuation pipe, in such fashion as to cool the wall provided with a jacketing and to produce steam with rather high pressure.

France 728,117

**IMPROVEMENTS MADE IN THE MANUFACTURE OF CARBURETED WATER GAS**

Humphreys & Glasgow, Ltd., U.S.A.

*Apr. 5, 1932; application filed in Paris Dec. 11, 1931.*

*Application filed in the U.S.A. Mar. 1, 1931.*

*Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the manufacture of carbureted water gas in which, during the period of air blowing, the producer gas engendered by primary air blowing is burned by secondary air at a point adjacent to the top of the fuel bed in order to heat a dome at the top of the fuel bed onto which heavy oil is projected and vaporized, characterized by the fact that the secondary air is introduced following a descending direction in order to reduce the quantity of fuel driven by blowing to the top of the fuel bed.

France 729,063

**PROCESS AND GAS GENERATOR FOR THE TOTAL GASIFICATION OF FUELS**

Bamag-Mequin A. G., Germany

*Apr. 19, 1932; application filed in Paris Dec. 30, 1931.*

*Gr. 15, Cl. 3*

The invention consists of a process for the production of water gas, starting with coal of the caking or swelling type, by means of intermittently operating gas generators, the exhausted and incandescent fuel being covered over with a thin layer of fresh fuel, and in which:

(a) The thin layer of fresh fuel is equalized and ventilated during the operation, for example by means of a rake;

(b) The thin layer of fresh fuel is moved by the rake from the center toward the periphery of the gas generator;

(c) The rotating grate of the gas generator is integral with a truncated stack or column with a round or polygonal cross section and with a smooth exterior or an exterior hollowed with grooves, equipped with orifices, and penetrating into the column of fuel as far as in the vicinity of the thin layer of fresh fuel;

(d) Additional heat is brought to the gas generator during the gasification period, for example by means of gas or steam, both superheated, introduced, for exam-

ple, into the zone of separation between the fresh fuel and the exhausted fuel.

France 730,553

**IMPROVEMENTS IN THE INSTALLATIONS FOR MANUFACTURING CARBURETED WATER GAS**

Humphreys & Glasgow, England

*May 17, 1932; application filed in Paris Oct. 21, 1931.*

*Application filed in the U.S.A. Dec. 9, 1930.*

*Gr. 15, Cl. 3*

The present invention concerns:

(1) An installation for the production of carbureted water gas in which the apparatus are contained in two casings, the said installation including a generator intended to contain a mass of fuel; means for admitting secondary air onto the edges of this mass of fuel in the vicinity of the upper part of the latter; means for injecting atomized oil onto the area above the mass of fuel; a receptacle intended to contain a refractory material; and a gas pipe extending from the generator to the said receptacle.

France 732,415

**DEVICE FOR INJECTING VAPOR INTO THE CHAMBERS FOR DISTILLING COAL**

Fours Picard, France

*June 14, 1932; application filed in Paris Feb. 27, 1932.*

*Gr. 15, Cl. 3*

The present invention consists of a device for injecting vapor into the vertical distillation chambers for coal, characterized by the fact that pipes are arranged in the refractory elements constituting the bottom of the combustion chambers and in which the vapor is superheated before penetrating into the distillation chambers by appropriate ducts.

France 732,918

**CHARGING PROCESS FOR GAS GENERATORS**

Humboldt-Deutzmotoren A. G., Germany

*June 27, 1932; application filed in Paris Mar. 10, 1932.*

*Application filed in Germany Mar. 10, 1931.*

*Gr. 15, Cl. 3*

The present invention consists of:

(1) A process of charging gas generators characterized by the fact that at a determined temperature, too high or too low, of the gases evacuated, a measuring apparatus (thermic element, for example) causes an adjustment device to operate which determines the size of the charge.

France 733,638

**PROCESSES FOR THE TREATMENT OF COAL AND OTHER MATERIALS**

Pierre-Eugène-Henri Forsans, France

*July 12, 1932; application filed in Paris June 17, 1931.*

*Gr. 15, Cl. 3*

The present invention concerns processes of drying and preheating applying to fuels, coals, lignites, schist, etc., and various materials, and is characterized by:

(1) Drying and preheating up to the departure temperature of the distillation of the coal destined next to be coked in coking ovens, gas ovens, or any type of ovens of the same sort, at high or low temperature, which are not already applying this process.

France 734,600

**PROCESS FOR CARBURETING GASES UNDER PRESSURE**

Metallgesellschaft A.G., Germany

*Aug. 2, 1932; application filed in Paris Apr. 4, 1932.*

*Application filed in Germany May 1, 1931.*

*Gr. 15, Cl. 3*

The invention consists of:

1. A process for carbureting gases under pressure



whereby a part of this gas is burned under pressure by means of oxygen or air enriched with oxygen, followed by adding a carburizing agent to the gas thus heated, after which the rich gas thus obtained is incorporated to the rest of the gas to be carburized.

France 735,006

**DISTILLATION OVEN FOR THE PRODUCTION OF ILLUMINATING GAS AND COMBINED WITH A WATER-GAS GENERATOR**

Forni Industriali Simboli, Italy

*Aug. 13, 1932; application filed in Paris Apr. 11, 1932.*  
*Application filed in Italy Feb. 13, 1932.*

*Gr. 15, Cl. 3*

The present invention concerns a distillation oven for the manufacture of lighting gas and combined with a water-gas generator, this oven being characterized by the fact that, a water-gas generator is assembled to its rear part, from which the gas produced is conducted into one or several retorts of the oven for the distillation of oil-gas.

France 735,236

**PROCESS AND DEVICE FOR THE DRYING AND GASIFICATION OF SOLID FUELS**

I. G. Farbenindustrie A. G., Germany

*Aug. 23, 1932; application filed in Paris Apr. 15, 1932.*

*Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the drying and gasification of solid fuels, consisting of effecting in a single installation the drying, the degasification, and the gasification of solid fuels, especially of crude lignite.

(2) The fuel is dried and degasified in a known [type of] oven, for example, in an oven for lignite with a single or double sloping grate, by means of the heat produced by combustion of one part of the gases and vapors which escape from the fuel when it is being dried and degasified, on the grate, if necessary with the aid of auxiliary heating, for example by the combustion of dust or oil; and the coke thus formed is introduced in an incandescent state into the gas generator which constitutes part of the installation and where it is gasified.

France 735,989

**VERTICAL OVEN FOR THE THERMAL TREATMENT OF FUELS**

Stettiner Chamotte-Fabrik A. G., vormals Didier, Germany

*Sept. 6, 1932; application filed in Paris Apr. 26, 1932.*

*Two applications filed in Germany May 7, 1931, and Apr. 7, 1932.*

*Gr. 15, Cl. 3*

The invention consists of a vertical oven for the thermal treatment of fuels, characterized by the fact that . . . the vertical axis of the treatment chamber or chambers contains one or several elbows, in such fashion that there is no longer any coherent cross-section of the charging column in the vertical direction.

France 740,432

**GAS GENERATOR**

Humboldt-Deutzmotoren A. G., Germany

*Nov. 14, 1932; application filed in Paris July 23, 1932.*

*Patent application and utility model application filed in Germany Aug. 5, 1931, and Aug. 1, 1931, respectively.*

*Gr. 15, Cl. 3*

The present invention consists of a gas generator with a rotating grate, characterized by the fact that:

(a) Both the charging of the generator depending on the height of the column of fuel in the charging shaft, and the ratio between the steam and the air in

the mixture fed to the grate in order to arrive at automatic operation of the apparatus, are regulated, as well as the evacuation of slag from the ashpit, by means of an adjustable evacuation shovel arranged outside a special raking device.

France 741,777

**IMPROVEMENTS IN GAS GENERATORS**

Paul Becudequin, France

*Dec. 13, 1932; application filed in Paris Nov. 18, 1931.*

*Gr. 15, Cl. 3*

The invention consists of an improvement in gas generators consisting of collecting the ashes on a faceplate, the edges of which are connected with the gas generators in such fashion as to form a tight container; this faceplate contains, for the evacuation of the ashes, orifices with suitable means for preventing reentries of air.

In one example of the invention, the faceplate contains at least one orifice in the vicinity of its periphery and rotating blades are mounted on the axis of the coking plate in such fashion as to push the ashes toward the orifice.

It is advantageous to provide orifices in the wall of the reserve hopper.

France 742,514

**PROCESS AND DEVICE FOR THE MANUFACTURE OF WATER GAS IN CHAMBERED FURNACES AND RETORT FURNACES**

Firma Carl Still, Germany, and Alfred Bogiet, Czechoslovakia

*Dec. 27, 1932; application filed in Paris Aug. 6, 1932.*

*Application filed in Germany Aug. 11, 1931.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the manufacture of water gas in chambered furnaces and retort furnaces with heated sidewalls, intended for the manufacture of coke and of gas, characterized by the fact that, after complete distillation of the volatile materials, pipes for injection of steam are introduced halfway between the heated sidewalls into openings provided by the removal of bars put in place before the coal is changed and left in the coal until the pipes are introduced.

France 743,915

**IMPROVEMENTS IN THE MANUFACTURE OF WATER GAS**

Humphreys & Glasgow, Ltd., England

*Jan. 16, 1933; application filed in Paris Oct. 12, 1932.*

*Application filed in England Apr. 20, 1932.*

*Gr. 15, Cl. 3*

The present invention concerns:

(1) Improvements in the process for manufacturing water gas, in which the gases resulting from blowing and coming from the generator are used for storing heat in regeneration chambers and for the production of steam, in accordance with which improvements the quantity of steam produced to satisfy the needs of the process is regulated by forcing the steam used for the production of gas to not sweep along and to not lead back to the generator any quantity of the heat stored, or else to sweep along or to lead back a variable quantity.

France 744,398

**PROCESS FOR THE GASIFICATION OF FUELS WHICH HAVE A TENDENCY TO AGGLUTINATE**

I. G. Farbenindustrie A. G., Germany

*Jan. 21, 1933; application filed in Paris Oct. 21, 1932.*

*Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the gasification of fuels which have a tendency to agglutinate, consisting of causing the raw materials to be distributed in a slow stream in

the form of finely granulated fuel onto the incandescent fuel bed and the latter preferably a thick fuel bed, of a gas generator, while the fuel bed is agitated throughout its entire thickness in a known fashion by the gasifying agents, in the manner of a boiling liquid.

France 748,753

**DEVICE FOR EVACUATING THE RESIDUES OF GASIFICATION FROM GAS GENERATORS**

Metallgesellschaft A. G., Germany

*Apr. 25, 1933; application filed in Paris Jan. 9, 1933.*  
*Application filed in Germany Mar. 10, 1932.*

*Gr. 15, Cl. 3*

The invention concerns:

An evacuation device for gas generators in which the column of fuel is supported by a table and characterized by an opening provided in the middle of the table and to which the gasification residues are led by a turning drum, preferably conical, mounted above the table, in order to arrive rapidly at an evacuation sieve after having traversed the opening.

France 749,178

**IMPROVEMENT IN THE PRODUCTION OF FUEL GASES BY MEANS OF CARBONACEOUS MATERIALS**

W. C. Holmes & Co., Ltd., England

*May 2, 1933; application filed Jan. 17, 1933.*

*Gr. 15, Cl. 3*

The invention concerns a process for obtaining fuel gases extracted from carbonaceous materials placed in contact with steam at a sufficiently high temperature to provoke a reaction between the steam and the carbon.

The process of the invention is further characterized by . . . the fact that:

(1) The steam is obtained by evaporation of ammoniac solution.

(2) The ammoniac solution which serves to produce the steam has first been completely freed or in part freed of its content of free ammonia.

France 749,986

**IMPROVEMENTS IN THE PRODUCTION OF GAS BY COMPLETE GASIFICATION**

Humphreys & Glasgow, Ltd., England

*May 15, 1933; application filed in Paris Feb. 3, 1933.*  
*Application filed in England Apr. 16, 1932.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for complete gasification, in which water gas produced in the water gas production zone of a complete gasification generator is extracted and burned to supply the heat required to carbonize the coal added to that which is carbonized in the generator.

France 751,323

**GAS GENERATOR FOR THE PRODUCTION OF A MIXTURE OF WATER GAS AND COAL GAS (DILUTED GAS) WITH SLOPING RETORTS AND EXTRACTION OF COKE**

Pierre de Brouwer. Vergasungs-Industrie A.G. Austria

*June 19, 1933; application filed in Paris Feb. 24, 1933.*  
*Application filed in Italy Feb. 25, 1932.*

*Gr. 15, Cl. 3*

The invention concerns:

A gas generator for the production of a mixture of water gas and coal gas (double gas), characterized by the fact that . . . it is equipped with one or several sloping distillation retorts; . . . In the sloping retort or retorts, feeding with coal is handled by means of an endless screw or by any other transport device; . . . In the chamber which places the sloping retort or retorts and the gasification vessel in communication, a device is provided for extracting coke, and that the said extraction is made possible by the mechanical transportation of the coal in the retorts.

France 755,766

**IMPROVEMENTS IN GAS GENERATORS**

Whitfield Gas Producer Patents, Ltd., and John Norman Williams, England

*Sept. 11, 1933; application filed in Paris May 18, 1933.*  
*Application filed in England May 28, 1932.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator of the type in which regulation of combustion is obtained by the subdividing of the grate into sections and by the restricting of the admission of air to each section at a point distant from the surface of the grate, the said gas generator being characterized by the fact that air is conducted to the surface of the grate by ducts which are relatively wide at one end in order to form the orifices of the surface of the grate, and which are relatively narrow and throttled at a point far from this extremity. This gas generator is further characterized by the fact that:

(a) In their narrowest parts, the cross section of the ducts does not exceed one-sixth of the cross section of the large orifices on the surface of the grate.

France 756,778

**PROCESS FOR THE GASIFICATION OF FINELY GRANULATED MOIST FUELS**

I. G. Farbenindustrie A. G., Germany

*Sept. 25, 1933; application filed in Paris June 10, 1933.*  
*Application filed in Germany June 28, 1932.*

*Gr. 15, Cl. 3*

The invention concerns a process for the gasification of finely granulated moist fuels, the fuel bed being kept constantly in motion throughout its depth by the gasification agent, consisting of introducing the moist fuel into the upper part of the gas generator or of a dust remover connected to it, and of causing it to be continually forced down the length of an inclined plane, bathed by the hot products of the gasification and, if necessary, covered over.

France 758,878

**IMPROVEMENTS IN THE MANUFACTURE OF WATER GAS**

Humphreys & Glasgow, Ltd., England

*Nov. 7, 1933; application filed in Paris July 25, 1933.*  
*Application filed in England Apr. 20, 1933.*

*Gr. 15, Cl. 3*

The invention concerns a process for the manufacture of water-gas in which the mass of fuel contained in a water gas generator is continuously fed with fuel by means of a feed pipe; the lower part of the wall of this pipe extends downward inside the generator in such fashion as to form around its lower part an annular chamber the bottom of which is constituted by the open surface of the fuel mass, and the gases resulting from air blowing, before leaving the generator, are burned with secondary air; during the period of water-gas production, when carburetion is necessary, oil, oil residues, tar, etc., are vaporized and subjected to dissociation in the said chamber, the fixing of the gases thus produced being effected by passage through a part of the fuel mass.

France 759,154

**PROCESS FOR THE GASIFICATION OF SOLID FUELS**

Edouard-Louis-Arthur Brodeur, France

*Nov. 16, 1933; application filed in Marseilles Oct. 24, 1932.*

*Gr. 15, Cl. 3*

The invention consists of a process for the gasification of solid fuels which consists of first separating the carbons which constitute them in such fashion as to feed the gasification firebox with only fixed carbon completely free of volatile materials and of moisture;

of transforming, by combustion, the volatile materials into fixed noncombustible materials, then, by their reduction through the firebox where the gasification of the fixed carbon is simultaneously done, of rendering combustible the noncombustible gases obtained, the necessary gaseous movements being obtained without the intervention of any auxiliary mechanical means of movement.

France 759,246

**PROCESS AND APPARATUS FOR THE MANUFACTURE OF GAS**

Air Reduction Co., Inc., U.S.A.

*Nov. 16, 1933; application filed in Paris July 26, 1933.  
Gr. 15, Cl. 3*

The invention consists of a process for producing, in a continuous fashion, gas for industrial or other uses, in which a carbonaceous fuel and oxygen containing substantially no nitrogen are fed in a continuous fashion to a heated reaction chamber, the quantity of oxygen being limited in such fashion that the carbon of one part of the fuel reacts with that quantity in such a way as not to produce substantially anything but carbon monoxide, steam being fed in a continuous fashion to the reaction chamber in a limited quantity in order to react with the remainder of the fuel for the purpose of yielding only carbon monoxide and hydrogen.

This process is further characterized by . . . the fact that the temperature attained by the gaseous products of the initial reaction of the fuel with oxygen prevents any substantial formation of carbonic gas.

France 760,698

**ASH-FUSION GAS GENERATOR**

René Gadret, France

*Dec. 14, 1933; application filed in Paris Sept. 12, 1933.  
Gr. 15, Cl. 3*

This invention concerns a gas generator particularly characterized by the fact that:

(1) The coal fed to the gas generator, which has a moveable firebox, is treated by air or oxygen led by one or several tuyères provided with a protective device, the gas thus obtained passing into a concentric filter assuring as complete purification of the gas as possible, evacuation of the molten ashes being facilitated by a tuyère blowing air and a small quantity of pulverized coal in order to render these ashes less compact, the pulverized coal thus injected being susceptible, if need be, of also serving for the manufacture of gas and introduction of special products such as carbonate of lime or others, mixed with the blast of air and pulverized coal which makes possible the use of the ashes for the purpose of the manufacture of pavements, paving stones, etc.

France 761,506

**PROCESS FOR OBTAINING WATER GAS**

Bamaq-Mequin A. G., Germany

*Jan. 5, 1934; application filed in Paris Oct. 3, 1933.  
Gr. 15, Cl. 3*

The invention concerns a process for the production of water gas starting with fuels with a strong reaction, such as porous coking coal, coke in small pieces, medium coke, and similar fuels, in water-gas production installations with passage of the gas in both directions, and this process also being able to present in addition the following characteristics:

(a) Steam is used for the making of the water gas, and water is injected at the top to cause the gas to descend.

(b) The direction of the passage of the gas is inverted before the end of the making of the gas with

introduction of steam, and water is injected at the top;

(c) During the descent of the gas, first vapor and then water are injected into the column of fuel, or the operation is performed in the inverse manner;

(d) During the descent of the gas, water is introduced with the addition of a solution of an agent favoring the production of  $\text{CH}_4$  in the upper cold bed of the column of fuel;

(e) The injection of water or of the mixture of water and the solution mentioned in (d) above is effected by means of a propelling agent: carbon dioxide, vapor, or the like.

France 766,166

**PROCESS FOR THE PREPARATION OF AN OIL GAS STARTING WITH PRODUCER GAS**

N.V. Machinerieën-En Apparaten Fabrieken, Netherlands  
*Apr. 9, 1934; application filed in Paris Dec. 27, 1933.*

*Application filed in Germany Jan. 5, 1933.*

*Gr. 15, Cl. 3*

The invention concerns a process for obtaining an oil gas starting with producer gas, and in particular, from water gas, by the method of transformation into methane, if necessary, with partial conversion beforehand, which consists of not pushing the transformation into methane, except to the extent needed for obtaining a gas which has approximately the composition and the calorific value or the specific weight of illuminating gas.

France 766,956

**DEVICE FOR INJECTING VAPOR AT THE BASE OF RETORTS OR VERTICAL CHAMBERS SERVING FOR THE PRODUCTION OF ILLUMINATING GAS**

(Moliard.—Pierre, Achille, Félicien, and Ernest.) Société Anonyme des Usines à Gaz du Nord et de l'Est, France

*Apr. 23, 1934; application filed in Paris Apr. 1, 1933.*

*Gr. 15, Cl. 3*

The invention consists of:

(I) A device for injecting vapor at the base of vertical retorts or chambers serving for the production of illuminating gas, characterized by the fact that the vapor inlet is at the center of the base of the retort, for example, in a hood pierced with holes at the upper part.

France 767,562

**IMPROVEMENTS IN THE MANUFACTURE OF GAS**

Humphreys & Glasgow, Ltd., England

*May 1, 1934; application filed in Paris Jan. 23, 1934.*

*Application filed in England Nov. 29, 1933.*

*Gr. 15, Cl. 3*

The invention consists of a chamber for the carbonization of coal, in which the heating gases pass through the fuel contained in the said chamber, which contains a rotating body or core, or a certain number of rotating bodies or cores.

France 770,608

**PROCESS OF REACTION OF CARBON MONOXIDE WITH WATER VAPOR**

Oesterreichische Amerikanisch Magnesit A. G., Austria

*July 2, 1934; application filed in Paris Mar. 23, 1934.*

*Application filed in Austria Mar. 24, 1933.*

*Gr. 15, Cl. 3*

The invention consists of:

(1) A process of reaction of carbon monoxide or of gaseous mixtures containing CO with water vapor, characterized by the fact that the reaction takes place under superpressure, using a catalyzer composed of magnesium oxide, and of carbon, or composed of magnesium oxide, carbon and alkaline carbonate, in particular potash.

(2) A process in accordance with (1) above, char-

acterized by the fact that the reaction is effected in two (or several) working cycles, the first of which takes place within the temperature limits between 400° and 500° C., and the second (or last) between 400° and 320° C.

France 771,960

**PROCESS AND APPARATUS FOR GASIFYING PULVERIZED FUELS AND IN PARTICULAR COAL DUST**

Geza Szikla and Arthur Rozinek, Hungary

*Aug. 6, 1934; application filed in Paris Apr. 18, 1934. Application filed in Germany Apr. 18, 1933.*

*Gr. 15, Cl. 3*

The invention consists of a process for the total or partial gasification of pulverized fuel, in particular crude coal dust, in which distillation and gasification of the coal dust introduced into the gasification chamber takes place in a rising current of air, characterized by the fact that the generator gas produced, at a high temperature, in a rising current of air (which high temperature gives rise to the easy fusion of slag and to the intense gasification of the particles of coke), is cooled to a temperature which is not injurious to masonry by fresh coal dust introduced into the gasification chamber, at the same time that coking of this dust takes place.

France 774,507

**PROCESS FOR GASIFYING FINE-GRAIN FUELS**

I. G. Farbenindustrie A. G., Germany

*Sept. 24, 1934; application filed in Paris June 13, 1934. Application filed in Germany July 7, 1933.*

*Gr. 15, Cl. 3*

The invention consists of:

(1) A process for the gasification of fine-grain fuel agitated throughout the entire thickness of their bed in the manner of a boiling liquid by means of gases introduced, consisting of introducing laterally or at the lower part, into the fuel bed, in addition to the gasification agent, such fuel gases as water gas, air gas, mixed gas, etc., preferably a part of the final gas which escapes from the top of the gas generator.

France 795,555

**IMPROVEMENTS IN APPARATUS FOR PRODUCING GENERATOR GAS**

Fours et Appareils Stein, S.A., France

*Jan. 8, 1936; application filed Dec. 22, 1934.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator for producing generator gas without dust, starting with coal fines with a variety of volatile materials content, and characterized essentially by the fact that the feeding of the fuel to be gasified is done "from below."

The invention can also present the following characteristics:

(1) Feeding takes place following the longitudinal axis of the horizontal section of the gas generator.

France 796,002

**PROCESS FOR PREPARING FUEL GASES, IN PARTICULAR GASES SIMILAR TO ILLUMINATING GASES**

I. G. Farbenindustrie A. G., Germany

*Jan. 17, 1936; application filed in Paris Oct. 7, 1935. Application filed in Germany Nov. 24, 1934.*

*Gr. 15, Cl. 3*

The invention consists of a process for producing fuel gases by diluting hydrocarbons at high temperatures, with or without the use of steam, in chambers equipped with an internal element which accumulates heat arranged with a view to their periodic heating and acting, if necessary, catalytically, with formation of gases rich in hydrogen and appreciable quantities of carbon,

consisting of mixing the gases obtained in this fashion with those [gases] collected during the period of sweeping the chambers by the fire and also, if necessary, with those [gases] collected during the period of blast heating the chambers following the release of the gases by combustion.

France 797,065

**GAS GENERATOR FOR THE PRODUCTION OF WATER GAS**

Giulio Diena, Italy

*Feb. 3, 1936; application filed in Paris Oct. 25, 1935. Application filed in Germany Oct. 30, 1934 in the name of Pietro Masso.*

*Gr. 15, Cl. 3*

The subject of the invention is a gas generator for the production of water gas, using pulverized coal and including two separate chambers, in the first of which coal is partially burned and attains incandescence, while in the second it reacts with steam, the gas generator being characterized by the fact that the two chambers are arranged concentrically facing each other and separated from each other by a heat-conductive partition, in such fashion that the inner chamber is not only insulated effectively toward the outside, owing to the presence of the outer chamber, but also that it shall still receive, through the heat-permeable partition, a part of the heat developed in the exterior chamber. The gas generator can be further characterized by the fact that:

(1) The gas generator proper includes an appropriately insulated casing, in which an injector device, activated by compressed air, introduces coal dust, in such fashion that this coal dust burns partially in the air and thus maintains the necessary temperature; while the rest of the coal dust simply becomes incandescent and is next introduced, by an injector device, activated by steam under pressure, into a pipe and finally into the second chamber, inside the abovementioned casing, and in which the steam and the coal dust, brought to a suitable temperature, react with each other, with the formation of water gas.

France 797,431

**PROCESS FOR THE GASIFICATION OF COAL FINES OR PULVERIZED COAL BY CIRCULATION**

Wintershall A. G., and Hans Schmalfeldt, Germany

*Feb. 3, 1936; application filed in Strassburg Nov. 9, 1935. Patent application filed in Germany Nov. 26, 1934.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the gasification of pulverized or finely granulated fuels by means of circulation gas reheated by the regeneration method, characterized by the fact that each regeneration zone is provided with special communication with the gasification chamber, into which communication only circulation gas passes; and that, in order to achieve a temporary closure of this communication, means are provided for obtaining a certain pressure of the hot circulation gas in order to drive it from the respective regeneration zone into the gasification zone.

France 799,707

**IMPROVEMENT IN ASH-FUSION GAS GENERATORS**

Henri Philipon, France

*Apr. 11, 1936; application filed in Paris Mar. 23, 1935.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) An improvement in ash-fusion gas generators consisting of introducing oxygen, either alone, or mixed with steam, in the high-temperature blast blown by means of tuyères;

(2) The mixture of oxygen and steam introduced in

the blast blown by means of tuyères has a proportion which is such that the slag obtained retains a substantially constant composition;

(3) Treatment in gas generators blown by hot air enriched with oxygen, of ores or residues containing principally iron, nickel, etc., zinc, lead, tin, etc., phosphorus, arsenic, antimony, etc., with production of ferrosilicons in the case of treatment of iron ores, or with volatilization of the zinc, the lead, the tin, the phosphorus, etc., in the event of treatment of ores containing volatilizable metals or metalloids.

France 800,330

PROCESS FOR THE GASIFICATION BY MEANS OF GAS CIRCULATION OF PULVERIZED FUELS AND FUEL FINES

Wintershall A. G., and Hans Schmalfeldt, Germany

*Apr. 27, 1936; application filed in Strassburg Nov. 9, 1935. Application filed in Germany Nov. 26, 1934.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the gasification of fine-grain fuels or pulverized fuel, by means of circulation gas heated to a high temperature, in a continuous circuit, characterized by the fact that the circulation gases coming out of the gas generator and charged with wholly or partially gasified dust, serve to dry the necessary quantity of fuel, for example by means of a drying device (drying drum), and preferably by the use of drying by circulation, in which the crude fuel is introduced into the flow of gas and is at the same time disintegrated by the drying thus produced, if necessary, with the aid of mechanical means to assure a more advanced disintegration; while a part of the dust obtained by circulation drying is definitely removed from the circuit, in such fashion that the ash content of the pulverized coal to be gasified is kept to an appropriate percentage.

France 800,785

GAS GENERATOR

Carl Bleyer, Germany

*May 11, 1936; application filed in Paris Jan. 17, 1936.*

*Gr. 15, Cl. 3*

The invention concerns an application of the gas generator which was the subject of the applicant's previous Patent 698,042 for the production of such gas as producer gas, characterized by the fact that a mixture of air and steam is blown in an uninterrupted manner into the gasification zone and that the producer gas formed in the latter is subdivided into two partial currents, one of which traverses the heating ducts and is burned there with secondary air brought in by auxiliary ducts, while the other partial current is introduced to the lower part of the distillation chamber which has compartments of a larger diameter, this latter current emerging at a chosen height with the distillation gases formed in the distillation zone and the distillation products formed at the upper part of the distillation zone being exhausted in an independent manner in order to be returned into the gasification zone.

France 801,309

PROCESS FOR THE PRODUCTION OF A WATER GAS WITHOUT TAR OR HYDROCARBONS, STARTING WITH BITUMINOUS FUELS

Franz Volk, Austria

*May 16, 1936; application filed in Paris Jan. 25, 1936.*

*Gr. 15, Cl. 3*

The invention concerns a process for the production of water gas without tar or hydrocarbons starting with bituminous fuels, by distillation of the fuel in the dis-

tillation chambers preceding the gasification shaft, this process being characterized by the fact that the water gas produced by gasification from bottom to top is evacuated, after having been freed either entirely or for the most part of the volatile products of the distillation, the latter being brought to a high temperature in an auxiliary chamber with a minimum quantity of water gas, in order to be treated there.

France 803,253

GENERATOR FOR PRODUCING WATER GAS ON A CONTINUOUS OPERATING BASIS

I. G. Farbenindustrie A. G., Germany

*June 29, 1936; application filed Mar. 4, 1936, in Paris Application filed in Germany Mar. 12, 1935.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator in the form of a chamber for producing water gas on a continuous operation basis, charged from above, and in which the ash is withdrawn from below and the gasification agent is introduced by the lower part into the bed [of fuel] undergoing gasification, characterized by the fact that the lower part of the chamber is divided by partitions into several narrow compartments, elongated and equipped with devices for the evacuation of the ashes, the said partitions preferably having ducts inside through which the gasification agent is introduced by means of communication openings into the compartments formed by the partitioning.

France 803,293

IMPROVEMENT IN ASH-FUSION GAS GENERATORS

Henri Philippon, France

*June 29, 1936; application filed in Paris Mar. 11, 1936. Application filed in Italy Dec. 21, 1935.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) The treatment in ash-fusion gas generators, of charges composed of carbon and a large fraction of products susceptible of being evacuated in a liquid state, while blowing into the gas generator a mixture of oxygen and steam.

(2) Blowing of gas generators of the ash-fusion type by a superheated mixture of oxygen and steam, the temperature of the mixture being higher than 200° and generally between 400° and 600°;

(3) The addition to the fuels of ores and flux susceptible of yielding, at the very high temperature of the operation, reduced metals which are evacuated from the apparatus in a molten state or which are volatilized.

France 803,294

PROCESS AND APPARATUS FOR THE GASIFICATION OF SOLID FUELS IN GAS GENERATORS

Fried. Krupp A. G., Germany

*June 29, 1936; application filed in Paris Mar. 11, 1936. Application filed in Germany Mar. 23, 1935.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the gasification of solid fuel in gas generators, characterized by the fact that the air needed for gasification, advantageously mixed with water vapor, is fed to the shaft of the generator—following the direction of the gasification, either in its central part, or at the side—until the vicinity of the gasification zone; and by the fact that the gasification products are evacuated from the shaft near the gasification zone, in a corresponding fashion—either obliquely from top to bottom, or in the opposite direction; or—for the purpose of giving the gasification zone an annular shape—in a transverse direction.

France 804,381

**DEVICE FOR ELIMINATING GASIFICATION RESIDUES FROM GENERATORS**

I. G. Farbenindustrie, A.G., Germany

*Aug. 3, 1936; application filed in Paris Apr. 2, 1936.**Application filed in Germany Apr. 16, 1935.**Gr. 15, Cl. 3*

The invention concerns a device for eliminating gasification residues from generators, including two superimposed plates the upper one of which is provided with slits through which the ashes fall on the lower plate and are eliminated from the latter by means of rotating scrapers placed between the two plates, characterized by the fact that in front of each slit of the upper plate a scraper is provided which rotates at the same speed and in the same direction as the upper plate, whereas the lower plate remains stationary.

France 807,583

**PROCESS FOR THE DEGASIFICATION OF LIQUIDS AND FUSION BATHS BY MEANS OF ORDINARY SOUND WAVES**

Friedrich Krüger, Germany

*Oct. 19, 1936; application filed in Paris Apr. 15, 1936.**Application filed in Germany Apr. 18, 1935.**Gr. 14, Cl. 6*

The invention extends principally to the following characteristics:

(1) Process for the degasification of liquids or fusion baths by means of sound waves, characterized by the fact that the frequencies of these sound waves are in the audible region, hence between 20 cycles and 20,000 cycles per second;

(2) The sound emitter is immersed or submerged in the liquid or fusion bath itself;

(3) It is not the sound broadcaster itself, but rather a transmitter fixed on the said broadcaster which is immersed in the liquid or fusion bath.

France 809,313

**PROCESS AND DEVICE FOR DECOMPOSING GASES OR THE VAPORS FROM SLOW DISTILLATION**

Rheinmetall-Borsig A.G., Werk Borsig Berlin-Tegel and Carl Geissen, Germany

*Dec. 3, 1936; application filed in Paris Aug. 10, 1936.**Two applications filed in Germany Nov. 12, 1935 and Jan. 22, 1936.**Gr. 15, Cl. 3*

The invention concerns a process for decomposing gases or vapors from slow distillation produced by the slow distillation of bituminous fuels, by causing the said gases or vapors to traverse coke, a process characterized by the following features:

(1) Freshly distilled coke in the distillation ovens is fed, in a continuous manner, under the protection of air, to a decomposition device in which the freshly distilled vapors obtained are sent through semicoke from distillation.

France 810,012

**PROCESS AND INSTALLATION FOR THE PRODUCTION OF A GAS APPROPRIATE FOR SYNTHESIS OF HYDROCARBONS STARTING WITH HYDROGEN AND CARBON MONOXIDE, ACCORDING TO THE PROCESS OF PROFESSOR FISCHER, AND FOR OTHER SIMILAR PURPOSES**

Heinrich Koppers' Industrieel Maatschappij N.V., Netherlands

*Dec. 19, 1936; application filed in Paris July 2, 1936.**Two applications filed in Germany July 3, and Aug. 2, 1935.**Gr. 15, Cl. 3*

The present invention concerns a process for the production of a gas appropriate for the synthesis of hydro-

carbons starting with H<sub>2</sub> and CO in accordance with Professor Fischer's process, the said gas being formed in a water-gas generator operating discontinuously, by reaction of coke and steam, a mixture of steam and coke-oven gas being fed, during the gasification period, into the gas generator, characterized by the fact that the mixture of steam and coke-oven gas, before the latter is fed into the gas generator, is heated in a heater connected to the generator and is reheated, during the period of blowing, by means of the blowing gases coming from the gas generator, and where the said mixture is brought to a temperature such that the hydrocarbons and the steam there are subjected to double decomposition. Materials can be arranged on the grating of the regenerator which, such as for example, iron ore, will accelerate the double decomposition of the hydrocarbons and the water vapor, while, for the purpose of the regeneration of these catalyzers, an excess of oxygen (air) can be added to the hot gases coming from blowing, before they shall have penetrated into the regenerator.

France 812,376

**PROCESS FOR THE PRODUCTION OF A PURE MIXTURE, COMPOSED OF CARBON MONOXIDE AND HYDROGEN**

Theodor Lichtenberger and Ludwig Kaiser, Germany

*Feb. 1, 1937; application filed in Paris July 8, 1936.**Gr. 15, Cl. 3*

The present invention concerns a process for the production of a pure mixture, composed of carbon monoxide and hydrogen, starting with fuels with the aid of a saline bath in fusion, characterized by the fact that the gases, which are formed in a shaft-type gas generator coming with highly heated fuels and steam, are taken again, after having traversed the fuels under their own pressure, in a known fashion, and are directed downward; and by the fact that they are made to pass through a saline bath which is in a reaction chamber and in which the remainder of the transformation of all the gaseous elements takes place with steam into carbon monoxide and into hydrogen; and by the fact that they are then evacuated by the orifice arranged in the gas-outlet chamber.

France 812,536

**FIREBOX FOR GAS GENERATOR WITH REVERSE COMBUSTION**

Elfa Elektrochemische Fabrik ARAU, Franke, Switzerland

*Feb. 1, 1937; application filed in Paris Oct. 26, 1936.**Applications filed in Germany Oct. 26, 1935 and Aug. 25, 1936.**Gr. 15, Cl. 3*

The invention concerns a firebox for gas generators with reverse combustion characterized by the fact that at a narrow part of the firebox a part in the form of a flange is placed which limits the cross section of the passage and which is so arranged that there exists between it and the wall of the firebox an empty space opening downward.

The invention can also be characterized by the fact that . . . the flange is placed at the base of the funnel which constitutes the constricted or narrow part [of the firebox].

France 812,877

**PROCESS AND DEVICE FOR THE CATALYTIC TREATMENT OR TRANSFORMATION OF GAS**

Franz Bössner and Carl Marischka, Austria

*Feb. 15, 1937; application filed in Paris Nov. 3, 1936.**Application filed in Austria Nov. 4, 1935.**Gr. 15, Cl. 3*

The invention concerns a process for the treatment or transformation of gas in the presence of a reaction

material susceptible of being regenerated by reheating, especially for the purpose of eliminating carbon monoxide and (or) carbon dioxide, characterized by the fact that between the contact chamber in which the treatment of the gas is effected, and a separate regeneration chamber of the contact chamber, in which regeneration of the reaction material takes place; this reaction material moves in a hot state in a closed circuit and repeated several times successively, the temperature of the reaction material not being either higher or lower than the limits between the treatment temperature and the regeneration temperature.

France 814,963

**PROCESS FOR THE PRODUCTION OF A GAS OF DETERMINED STOICHIOMETRICAL COMPOSITION BY DISTILLATION OF FUELS**

Didier-Werke A.G., Germany

*Mar. 30, 1937; application filed in Paris July 21, 1936. Application filed in Germany July 22, 1935.*

*Gr. 15, Cl. 3*

The invention concerns a process for the production of a gas of determined stoichiometrical composition starting with fuels, characterized by the fact that a gas with a high temperature is obtained by external heating, starting with a fuel which has been subjected beforehand to partial distillation, by external heating; the products obtained by this preliminary distillation having been eliminated, the high-temperature gas which is virtually free of secondary materials, such as carbon dioxide, sulphur, water vapor, and the like, is conducted with water vapor through a mass of incandescent coke.

France 818,146

**PROCESS FOR THE GASIFICATION OF FUELS AND OVEN WITH VERTICAL CHAMBERS TO PUT THIS PROCESS INTO EFFECT**

C. Otto & Comp. G.m.b.H., Germany

*June 14, 1937; application filed in Paris Feb. 20, 1937. Application filed in Germany Feb. 22, 1936*

*Gr. 15, Cl. 3*

The present invention concerns . . . a process for the continuous gasification of fuel with the addition of steam in ovens with vertical chambers heated from outside, with an elongated rectangular cross section, and including arrivals of vapor and departures of gas, and in communication with the chambers by openings distributed along their length, characterized by the fact that . . . the arrival of vapor and the departure of gas are effected in periodic alternation, in such fashion that the gasification agent, during the course of one of the periods, shall be conducted crosswise through the fuel from one longitudinal side of the chamber to the other, and in the opposite direction during the next period.

[The invention also concerns] . . . an oven with chambers, preferably arranged in a battery, suitable for putting into practice the process mentioned above, including a reheating of the gaseous heating agents in regenerators located in front of the small sides of the chambers, characterized by the fact that . . . both for the purpose of the admission of steam and for the purpose of the departure of the gas produced, regenerator chambers are arranged in such fashion that the steam and the gaseous heating agents not yet collected, on the one hand, and the burned heating gases and the gas produced, on the other hand, shall enter into a temperature exchange.

France 819,591

**PROCESS AND DEVICE FOR THE PRODUCTION OF A TAR-FREE WATER GAS WHICH IS ALSO FREE OF HYDROCARBONS, STARTING WITH BITUMINOUS FUELS**

Vergasungs Industrie A.G., Austria

*July 12, 1937; application filed in Paris Mar. 22, 1937. Application filed in Austria Nov. 2, 1936*

*Gr. 15, Cl. 3*

The invention concerns a . . . process for the production of water gas without tar or hydrocarbons starting with bituminous fuels in a gas generator including a distillation shaft superimposed on the gasification shaft with a superheater connected to the latter for the gasification with reversal of direction; this process being characterized by the fact that the distillation gases in the distillation shaft are subjected to circulation in closed circuit between the superheater, the gasification shaft, and the distillation shaft during gasification from bottom to top, this current of gas traversing always the distillation shaft countercurrently in relation to the fuel, whereas the water gas produced in the gasification shaft and the distillation gases emerge separately from the gas generator.

France 820,590

**PROCESS FOR PREPARING WATER GAS**

I. G. Farbenindustrie, Germany

*Aug. 2, 1937; application filed in Paris Apr. 14, 1937. Application filed in Germany Apr. 21, 1936.*

*Gr. 15, Cl. 3*

The invention concerns a process for producing continuously water gas rich in CO, by causing such fuels as lignite, coal, peat, wood, or their distillation residues to react with water vapor, or water vapor and oxygen or gases containing oxygen, or carbon dioxide, with simultaneous introduction of heat by means of gasification agents or by indirect heating of the fuels, in a shaft furnace where the gasification agents flow from bottom to top and from the top of which the water gas produced escapes, consisting of permitting the gasification agents or the heat to be introduced, or both, to act at separate points along the height of the gasification shaft in such fashion that relatively hot and relatively cold alternating zones are formed in the fuel bed.

France 823,858

**PROCESS AND DEVICE FOR THE GASIFICATION OF FUELS CONTAINING TAR, SUCH AS LIGNITES, PEAT, ETC., AS WELL AS OF HEAVY LIQUID FUELS**

Dezsö Mauthner, Hungary

*Oct. 25, 1937; application filed in Paris July 2, 1937. Application filed in Hungary July 2, 1936.*

*Gr. 15, Cl. 3*

The invention concerns a process for gasification of fuels containing tar, such as lignites, peat, etc., as well as of heavy liquid fuels, in particular for the production of a gas to feed internal combustion machines, characterized by the fact that gasification is conducted in two periods in two chambers arranged one above the other, wholly separated and communicating with each other only by ducts, in such a manner that the fuel is first freed of its tar content in the upper chamber (distillation chamber), then fed into the lower chamber (gasification chamber), where it is definitely gasified.

France 827,434

**PROCESS AND DEVICE FOR THE DISTILLATION OF PULVERIZED FUELS AT A LOW TEMPERATURE**

Julius Pintsch, Kommanditgesellschaft, Germany

*Jan. 24, 1938; application filed in Paris Oct. 2, 1937. Two applications filed in Germany Oct. 3 and 30, 1936.*

*Gr. 15, Cl. 3*

The invention concerns . . . a process for the dis-

tillation of pulverized fuel at a low temperature, consisting of causing the pulverized fuel to fall freely through a tubular system heated from outside . . . and characterized by the fact that . . . in order to dry the moist fuel, the sensible heat of the heating gases emerging from the distillation apparatus is used.

France 829,218

IMPROVMENTS IN GAS GENERATORS WITH BOILER LOCATED AT BASE OF HEARTH

Albert Béchevot, France

Mar. 21, 1938; application filed in Paris Feb. 15, 1937.  
Gr. 15, Cl. 3

The present invention concerns a certain number of improvements made in gas generators equipped with a boiler (or the vaporizer), the said improvements offering the following special characteristics:

(1) Use of a joint constituted by a plastic and non-combustible ring interposed between the hot boiler (or the vaporizer) and independent of the walls of the ashpit, on the one hand, and a cold metal basin containing only ashes and integral with the walls of the ashpit, on the other hand;

(2) Use, in combination with the aforesaid joint, of a rotating coking plate with a central cowl permitting poking, on the one hand, and the arrival of the mixture of air and vapor by the central part of the rotating coking plate, on the other hand.

France 829,259

DEVICE MAKING IT POSSIBLE TO ELIMINATE THE MOISTURE CONTAINED IN SOLID FUELS IN THE COURSE OF THEIR USE IN GAS GENERATORS

Jean Edmond Letscher, France

Mar. 21, 1938; application filed in Paris Oct. 13, 1937.  
Gr. 15, Cl. 3

The present invention concerns a process for causing an ascending circulation of gases to be formed in the mass of reserve fuel, which hot gases become charged with the moisture contained in the fuel; . . . for causing these gases to pass into a colder chamber, where they free themselves by condensation of the moisture with which they are saturated; . . . for conducting the condensation product to the outside and bringing back the dried gases to the base of the fuel reserve, from which place they begin again the foregoing cycle.

The foregoing process is carried out by means of a gas generator of the usual type, preferably cylindrical, which is not closed at the top, but is capped with a bell cover, which encases it, leaving between the wall of the gas generator and itself a circular space of several centimeters. This bell casing descends a little below half the height of the generator, and is hermetically jointed to a circular cornice. Several centimeters above the plane of this cornice, there are pierced in the wall and all around the gas generator, several rows of holes. These holes are covered inside the receptacle by a circular bib, leaving between the wall and itself, a certain space which is closed toward the top and open toward the bottom.

France 830,106

PROCESS AND DEVICE FOR GASIFYING FUELS IN VOLUMINOUS PIECES

I. G. Farbenindustrie A. G., Germany

May 9, 1938; application filed in Paris Nov. 27, 1937.  
Application filed in Germany Dec. 2, 1936.  
Gr. 15, Cl. 3

The present invention concerns a process for gasifying fuels in large pieces, such as briquettes of lignite, lignite, etc., consisting of first of all heating the fuel in

large pieces outside the gasification chamber properly speaking and above the fuel bed by means of gases produced in the generator, thus disaggregating the said fuel; of then causing the fuel thus obtained to descend, at a high temperature, separately from the gasification chamber, and of introducing it by means of adjustable devices into the lower part of the gas generator in a useful fashion into the fuel bed itself, where, in a known manner, it is agitated by the gasification agent in the manner of a liquid boiling.

France 831,838

GAS GENERATORS FOR OVENS WITH HORIZONTAL RETORTS

Heinrich Steinfeldt, Germany

June 13, 1938; application filed in Paris Jan. 10, 1938.  
Two applications filed in Germany Jan. 11 and May 26, 1937.

Gr. 15, Cl. 3

The invention concerns a gas generator with substantially vertical walls for ovens with horizontal retorts, characterized by the fact that the rear wall of the gas generator includes a projection in the form of a bracket which can also present one or several of the following special features:

(a) The slope of the projection corresponds to the angle of slope of the fuel charged;

(b) An evacuation opening for the departure of a current of derived gas from the gas generator is pierced in the projection of the rear wall of the gas generator, or immediately below the said projection.

France 839,391

GAS GENERATOR SYSTEM

Joseph Bethenod and Marcel Koehler, France

Jan. 4, 1939; application filed in Paris Dec. 6, 1937.  
Gr. 15, Cl. 3

The present invention concerns a gas generator system including:

(a) A part, at the very least, of the fuel is finely divided before its introduction into the combustion chamber;

(b) A part, at the very least, of the fuel is calibrated with a view to facilitating its introduction in measured quantities into the fuel combustion chamber;

(c) This fuel, as well as the air and possibly water or steam, are introduced, either individually, or simultaneously, in well defined proportions, into the combustion chamber.

(d) The combustion chamber is a well delimited space which can possibly contain a certain quantity of solid fuel in pieces;

(e) Initial ignition can be done by an incandescent electric sparker.

France 840,014

IMPROVEMENTS IN GAS GENERATORS

Joseph Bouteille and Marcel Koehler, France

Jan. 11, 1939; application filed in Paris Dec. 17, 1937.  
Gr. 15, Cl. 3

The invention concerns a gas generator in which the air necessary for combustion is separately introduced into the fire box, in appropriately measured quantities and under appropriate pressure, by means of several series of tuyères distributed at various levels in such fashion as to determine in the mass of fuel accumulated above the grate through which the ashes come out, several zones of different activity in which the desired reactions operate successively or alternately.



France 841,495

## IMPROVEMENTS IN INSTALLATIONS OF VERTICAL RETORTS FOR THE CARBONIZATION OF COAL AND OTHER LIKE MATERIALS

Frederick Joseph West, Ernest West and West's Gas Improvement Co., Ltd., England

*Feb. 6, 1939; application filed in Paris July 30, 1938. Application filed in England Aug. 18, 1937.**Gr. 15, Cl. 3*

The invention concerns improvements in installations of vertical retorts for the carbonization of coal and like materials, the said improvements presenting the following characteristics:

(1) The application, around the retorts of the installation, of a certain number of superimposed horizontal combustion chambers, each of which is divided into two sections which extend parallel along the opposite sides of the parts of the retorts which traverse them, each section presenting gas and air inlets at its opposite extremities, in such fashion that the flames move from one toward the other starting with the said extremities, with an outlet for the combustion products in the middle of the length of each section; these combustion products circulate in horizontal chambers for the circulation of burned gases around the retorts at a higher level than that of the combustion chambers.

France 841,624

## AIR-JET GAS GENERATOR WITH MOVABLE COKING PLATE

Auguste-Engène Lacombe, France

*Feb. 13, 1939; application filed in Paris Jan. 28, 1938.**Cl. 15, Cl. 3*

The present invention concerns an air-jet gas generator with a movable coking plate, characterized by the following points:

(1) The moveable coking plate is suspended to a float resting on the coal contained in the hopper and descending with it, in such manner as to assure approximate fixity in the space of the ash level, and of the firebox.

France 841,637

## TILTING AND MOVABLE GAS GENERATOR WITH IGNITION THROUGH THE GRATE

Gabriel Portail, France

*Feb. 13, 1939; application filed in Avignon July 29, 1938.**Gr. 15, Cl. 3*

The present invention concerns a tilting and moveable gas generator for all types of fuels, with ignition through the grate, producing pure and cold oil gas with the accessory use of any type of filter or a filter with triple effect which, like the gas generator, may be rapidly replaced.

France 843,515

## PROCESS FOR PRODUCING SYNTHESIS GAS BY GASIFICATION OF FUELS UNDER HIGH PRESSURE

Metallgesellschaft A.G., Germany

*Mar. 27, 1939; application filed in Paris Sept. 15, 1938. Application filed in Germany Sept. 27, 1937.**Gr. 15, Cl. 3*

The invention concerns a process for producing synthesis gas by gasification of fuels under high pressure of several atmospheres, by means of mixtures of oxygen and steam, consisting of adding to the gasification agent a quantity of carbon dioxide (which varies from approximately half to triple the volume of oxygen introduced), such as to cause the formation of methane to be considerably diminished and the ratio of the volumes of carbon monoxide to hydrogen in the end gas to be approximately one volume of CO to two volumes of hydrogen, although the content of CO can even be higher than the foregoing.

732-442-64-6

France 843,920

## PROCESS FOR PRODUCING A GAS OF A DETERMINED COMPOSITION, BY THE DISTILLATION OR GASIFICATION OF FUELS OF MIXED SIZES

Didier-Werke A.G., Germany

*Apr. 3, 1939; application filed in Paris Sept. 26, 1938. Application filed in Germany Oct. 20, 1937.**Gr. 15, Cl. 3*

The present invention concerns a process for the production of a gas of a determined composition, by degasification or distillation of a fuel in mixed or different sizes, characterized by the fact that the fuel is arranged in chambers containing juxtaposed columns, each column receiving fuel of a determined size, and by the fact that the gas produced in the column with the finest size [fuel] is led to traverse completely or in part the column with larger sizes [of fuel].

France 844,270

## GAS GENERATOR WITH VERTICAL TUYÈRE

André Richebois, France

*Apr. 17, 1939; application filed Oct. 4, 1938 in Paris.**Gr. 15, Cl. 3*

The present invention concerns a gas generator characterized by a vertical tuyère, centered on the axis of the apparatus, blowing into the latter a rotating current of air. A refractory well inside the firebox permits elevation of the temperature of the fuel, which is regulated by means of a circular ring and a depression chamber encircling the firebox.

France 845,209

## WATER GAS WITH LOW CO CONTENT, PROCESS AND DEVICES FOR ITS MANUFACTURE

Compagnie Continentale pour la Fabrication des Compteurs et autres Appareils and Charles Leroy, France

*May 8, 1939; application filed in Paris Oct. 26, 1938. Application filed in the Grand Duchy of Luxembourg Oct. 27, 1937.**Gr. 15, Cl. 3*

This invention concerns:

(1) A process for obtaining, in a gas generator, a water gas with a low carbon monoxide content, characterized by the fact that a rapid drop in the superficial temperature of the pieces of coal to be gasified is achieved, from the temperature as it exists at the end of the blast period, in order to bring it to a predetermined value, [which is] a function of the instantaneous carbon monoxide content which it is not desired to exceed.

France 845,252

## PROCESS FOR PRODUCING GASES RICH IN HYDROGEN AND LOW IN CARBON MONOXIDE IN GENERATORS EQUIPPED WITH AN UPPER DISTILLATION SHAFT AT A LOW TEMPERATURE

I. G. Farbenindustrie A. G., Germany

*May 8, 1939; application filed in Paris Oct. 27, 1938. Application filed in Germany Nov. 25, 1937.**Gr. 15, Cl. 3*

The invention concerns a process for producing gases rich in hydrogen and low in CO, starting with lignite, in generators equipped with an upper carbonization shaft, consisting of cooling before it descends into the gasification element the hot semicoke produced in the upper carbonization shaft up to the appropriate temperatures for the formation of a gas low in carbon monoxide.

France 845,316

**PROCESS FOR THE PRODUCTION OF A MIXED GAS, COMPOSED OF DISTILLATION GAS AND WATER GAS**

Didier-Werke A. G., Germany

*May 8, 1939; application filed in Paris Oct. 28, 1938.  
Gr. 15, Cl. 3*

The invention consists of a process for the production of a gaseous mixture formed of distillation gas and water gas with mixture in an outside heating chamber of the gases which are formed in externally heated chambers, characterized by the fact that the water gas is produced starting with a highly reactive fuel containing possibly volatile products, such as slow-distillation coke, lignite coke, or the like, if necessary also a mixture of distillation coke and lignite coke.

France 846,113

**GAS GENERATOR WITH REVERSE COMBUSTION**

Soc. Anonima Alfa-Romeo, Italy

*May 27, 1939; application filed in Paris Nov. 16, 1938.  
Application filed in Italy Dec. 13, 1937.  
Gr. 15, Cl. 3*

The invention concerns a gas generator for feeding combustion engines, the said gas generator being particularly appropriate for the combustion of ligneous materials, and characterized by the fact that . . . the gasification zone is externally scrubbed by countercurrent air which enters at the top of the hottest zone, owing to which fact the air, in turbulent motion, energetically cools the metal plates, thus permitting the achievement of a more intense and less thick oxidation zone than in other types which do not operate in countercurrent.

France 846,181

**DISTILLATION OVEN WITH A SHAFT OF AN ANNULAR SHAPE WITH CENTRAL CONDUCTION OF SWEEPING GASES**

Wilhelm Groth, Germany

*May 27, 1939; application filed in Paris. Nov. 27, 1938.  
Application filed in Germany on Nov. 19, 1937.  
Gr. 15, Cl. 3*

The present invention concerns a distillation oven with a shaft of an annular shape with central conduction of the sweeping gas or gases and with a heat-exchanger chamber located under the distillation chamber, the preheated sweeping gas being withdrawn into the gas-collector space of the heat-exchanger chamber aforementioned, prior to its passage into the distillation chamber, in order to be piped into a heating device. The new distillation oven is characterized by the fact that . . .

It contains a double concentric pipe penetrating axially by the bottom into the heat-exchanger chamber, the outer pipe (intended for the conduction of the cold sweeping gases) emptying at the lower part of the heat-exchanger chamber, whereas the inner pipe (intended for the conduction of the hot sweeping gas) extends as far as the lower part of the distillation chamber.

France 846,588

**PROCESS FOR THE PRODUCTION OF SYNTHETIC GAS**

Dr. C. Otto &amp; Co. G.m.b.H., Germany

*June 12, 1939; application filed in Paris. Nov. 24, 1938.  
Application filed in Germany Dec. 2, 1937.  
Gr. 15, Cl. 3*

The invention concerns a process for the production of synthetic gas for the purpose of obtaining essence [gasoline] by the Fischer-Tropsch method, in a metallurgical plant to which is annexed a coke plant, char-

acterized by the fact that . . . in the distillation gas obtained in coke ovens, preferably heated by means of blast-furnace gas, the hydrocarbons are essentially transformed into hydrogen and carbon monoxides, and to the gas thus transformed a quantity of blast-furnace gas is added which is such that in the mixture formed the necessary ratio of hydrogen to carbon monoxide is obtained for the synthesis of gasoline.

France 847,584

**GAS GENERATOR WITH ROTATING GRATE AND WITH ROTATING ASHPIT EQUIPPED WITH SCRAPERS AND WITH RING IMMERSSED IN THE ASHPIT**

Karl Koller, Hungary

*July 3, 1939; application filed in Paris Dec. 15, 1938.  
Application filed in Germany Dec. 27, 1937.  
Gr. 15, Cl. 1*

The invention extends principally to the following characteristics and to their various combinations:

(1) A gas generator with a rotating grate and a rotating ashpit, on the ascending bottom of which there are scrapers, with an immersed ring which penetrates into the ashpit and carries an extraction mechanism and several retainer or accumulation blades, the lower cutting edges of which cooperate with the sloping edges of the scrapers, characterized by the fact that the scrapers, executed preferably with a vertical working surface and which each bears a substantially vertical screen, are only arranged in the external part of the ascending bottom of the ashpit, the middle part of which is so sloped that the ashes can slide toward the scrapers, and by the fact that the retaining blades reascend along the inner wall of the submerged ring in such fashion that their vertical cutting edges cooperate with those of the screens.

France 847,593

**IMPROVEMENT IN THE PROCESS OF OPERATION OF VERTICAL CARBONIZATION RETORTS**

Woodall-Duckham (1920), Ltd., England

*July 3, 1939; application filed in Paris Dec. 15, 1938.  
Application filed in England Aug. 3, 1938.  
Gr. 15, Cl. 3*

The invention concerns improvements in the process for operating vertical carbonization retorts by means of two intermittent operating cycles, characterized by the fact that . . . a plug or bed of coke intended to separate the coke column from the retort is placed with the new charge of coal at the top of the column of coke which the retort contains before causing that shaft to descend in order to permit the introduction of the new charge of coal; . . . and that "run-of-mine" coal is used to form the plug of coke; . . . and that the surface of the plug of coke is permitted to be heated to incandescence before admitting a new charge of coal into the retort.

France 849,959

**IMPROVEMENTS IN GAS GENERATORS**

Alberto Romano, Italy

*Aug. 28, 1939; application filed in Nice Feb. 7, 1939.  
Application filed in the Grand Duchy of Luxembourg Feb. 7, 1938.**Gr. 15, Cl. 3*

The invention consists of a gas generator apparatus characterized by the fact that . . . the body of the gas generator is provided with a supporting cheek plate resting on the ashes above the gas-outlet pipe; and that . . . against the body of the gas generator, below the supporting face plate, a vaporizer coil is fed with water and feeding vapor, with the aid of an ejector, to the air-feed pipe.

France 850,489

**AUTOREGENERATIVE APPARATUS FOR THE LOW-TEMPERATURE GASIFICATION OF BITUMINOUS SCHISTS OR OF OTHER ORES CONTAINING VOLATILIZABLE SUBSTANCES**

Felice Piromalli, Italy

*Sept. 11, 1939; application filed in Paris Feb. 18, 1939.  
Gr. 15, Cl. 3*

The present invention concerns:

An autoregenerative apparatus for the low-temperature gasification of bituminous schists, of coal, of lignites, or of other materials containing volatilizable substances or any other organic materials, characterized by . . .

(a) Pyrogenation and gasification are achieved by means of action on the mass to be distilled by heated vapors or gases which are obtained by gasifying oil or the substance released by the material itself subjected to the process of pyrogenation. This substance, which acts in the form of gas or vapor with or without pressure, can either be pure, or mixed, with other chemical substances suitable for exercising an influence both on the operation of the gasification process and on the characteristics of the end product.

France 851,885

**PROCESS MAKING IT POSSIBLE TO INFLUENCE THE COMPOSITION OF GENERATOR GAS OR WATER GAS**

Karl Koller and Zsigmond Galocsy, Hungary

*Oct. 9, 1939; application filed in Paris Mar. 21, 1939.  
Gr. 15, Cl. 3*

The invention concerns . . . a process making it possible to influence the composition of generator gas or water gas in gas generators, characterized by the fact that any fuel is burned with air, with oxygen, or with oxygen enriched air, in a special combustion chamber, separated within the generator space, but mechanically connected to the said gas generator, while simultaneously introducing a volume of water vapor which may be necessary for the influence it is desired to exercise; and by the fact that the mixture of gas and smoke formed in this chamber is introduced into a zone of the gas generator which follows the gasification zone, and the temperature of which is below that of the said gasification zone, while in that zone of introduction, under the action of the said mixture of gas and smoke, in accordance with the conditions imposed, either an enrichment or a diminution is produced of the carbon monoxide, the hydrogen, the carbonic acid, or the methane, of the generator gas produced in the gasification zone.

France 852,015

**IMPROVEMENTS IN THE PRODUCTION OF WATER GAS**

Humphreys &amp; Glasgow, Ltd., England

*Oct. 16, 1939; application filed in Paris Mar. 23, 1939.  
Application filed in England May 2, 1938.*

*Gr. 15, Cl. 3*

The invention concerns the manufacture of water gas by a cyclical process consisting of blowing on a column of incandescent fuel, alternately, with air and with steam, in order to produce water gas, in which the period corresponding to the generation of the gas includes two or several short descending or inverse operating cycles, separated from each other by an ascending operation.

France 852,016

**IMPROVEMENTS IN THE PRODUCTION OF WATER GAS AND IN AN APPARATUS SERVING FOR THIS PURPOSE**

Humphreys &amp; Glasgow, Ltd., England

*Oct. 16, 1939; application filed in Paris Mar. 23, 1939.  
Application filed in England May 2, 1938.*

*Gr. 15, Cl. 3*

The present invention concerns . . . the production

of water gas by a cyclical process which consists of blasting a column of incandescent fuel alternately with air and with water vapor in order to produce water gas, with one of the following variants:

(a) Sweeping of the apparatus after blasting the fuel bed, with air, this sweeping being effected first by admitting steam at the base of the gas generator and by causing the water gas thus produced to burn until such time as its nitrogen content is sufficiently low, and next by admitting steam through the gas generator outlet in such fashion that this steam alone serves to purge the burned gases to the atmosphere.

France 852,268

**DISTILLATION FURNACE**

Lorenzo Caccioppoli, Italy

*Oct. 23, 1939; application filed in Paris Mar. 28, 1939.  
Application filed in Italy Apr. 6, 1938.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) An apparatus or furnace, with continuous operation, for the distillation or carbonization of solid fuels, bituminous schists, and the like, including in combination with a long distillation chamber, a conveyor of fuel into the aforementioned chamber, chambers for regulating the temperature, surrounding the distillation chamber, and a certain number of openings provided in the dome of the aforementioned distillation chamber for the extraction of the distillation products.

France 853,153

**DEVICE FOR SUPERHEATING STEAM IN FURNACES FOR THE INTERMITTENT DISTILLATION OF COAL WITH PRODUCTION OF WATER GAS**

Soc. Anonima Forni ed Impianti Industriali, Italy

*Nov. 18, 1939; application filed in Paris Apr. 15, 1939.  
Application filed in Italy Sept. 6, 1938.*

*Gr. 15, Cl. 3*

The invention concerns a device for superheating steam in furnaces for the intermittent distillation of coal with production of water gas, this device constructed such that the heated masonry of the furnace contains, in hollowed-out places or niches, pipes which constitute the elements of a superheater and which, on the one hand, are able to be connected individually with a feed pipe, and on the other hand, can be connected, also individually, with a collector from which originate branch pipes controlled by valves, the said branch pipes terminating in the interior of the chambers of the furnace.

This device can also be characterized by the fact that, between the steam feed pipe and each element of the superheater, there is a calibrated orifice to regulate the passage of steam.

France 853,154

**FURNACE WITH CHAMBER FOR THE INTERMITTENT DISTILLATION OF COAL WITH PRODUCTION OF WATER GAS**

Soc. An. Forni ed Impianti Industriali, Italy

*Nov. 18, 1939; application filed in Paris Apr. 15, 1939.  
Application filed in Italy Nov. 3, 1938.*

*Gr. 15, Cl. 3*

The invention concerns a furnace with a chamber for the intermittent distillation of coal, provided with means for introducing steam for the forming of water gas and in which, in the appropriate places, the walls or the hearth of the chamber, or both, are contained mouths into which the pipes empty, each of which, at the opposite end, communicates, through one or several calibrated orifices with a space, which extends over the entire length of the chamber and which, during the introduction of steam into the chamber [this space], is occupied by superheated vapor.

France 853,155

## PROCESS AND ARRANGEMENT FOR THE CONVERSION OF OIL GAS INTO GAS OF A LOW CALORIFIC VALUE

Soc. An. Forni ed Impianti Industriali, Italy

Nov. 18, 1939; application filed in Paris Apr. 15, 1939.  
Application filed in Italy Oct. 17, 1938.

Gr. 15, Cl. 3

The invention concerns: . . . A process for the conversion of oil gas into gas with low calorific value, in which the gas to be converted is introduced, with a quantity of air insufficient for combustion, into a chamber with predetermined pressure, the dimensions of which are calculated according to the nature and the quantity of the gas and according to the degree of conversion desired and in certain regions of which a fixed temperature is maintained, higher than the reaction temperature of the mixture of air and gas to be converted.

France 853,510

## INSTALLATION FOR THE PRODUCTION OF PRODUCER GAS

Heinrich Koppers' Industriele Maatschappij N.V. (in liquidation), Netherlands

Dec. 7, 1939; application filed in Paris Apr. 26, 1939.  
Four applications filed in Germany Apr. 28, May 7, July 7, 1938, and Apr. 1, 1939, in the name of Heinrich Koppers G.m.b.H.

Gr. 15, Cl. 3

The invention concerns a process for the production of a combustible producer gas of high calorific value, starting with pulverized fuels, by the gasification of the fuel in suspension, at the time of which hot combustion gases are obtained in a firebox and enter into contact in a shaft with pulverized fuel which, distributed over the crosssection of the shaft, fall freely from the ceiling of the latter, characterized by the fact that the hot combustion gases of the firebox enter into the upper part of the gasification shaft and, with the pulverized fuel traverse, both in the same direction, the shaft provided at its lower part with an opening for the escape of the useful gas; one part of the fuel to be gasified can be used to obtain hot fuel gases which enter into contact with the pulverized fuel and the fuel to be gasified can be introduced with steam, preferably superheated, into the reaction shaft.

France 855,218

## GAS GENERATOR

Hansa-Gas-Generatoren G.m.b.H., Germany

Feb. 5, 1940; application filed in Paris May 24, 1939.  
Application filed in Germany May 28, 1938.

Gr. 15, Cl. 3

The invention concerns a gas generator operating according to the principle of transverse current, in accordance with which the gases, produced by the injection of air at high speed, are directly or obliquely evacuated from the side opposite the injection of air, . . . characterized by the fact that directly in front, or obliquely in front, of a gas-outlet piping, several air-entry tuyères are arranged, communicating with the atmosphere, located horizontally side by side and capable of being closed, and below the tuyères, where the ash, and the slag which is formed, flow according to their natural slope of fall, there is arranged a poking door pierced in the exterior casing of the gas generator.

France 856,720

## GAS GENERATOR WITH HUMIDIFIER

Trinh-Hung-Ngau, Cochín, China

Mar. 23, 1940; application filed in Saigon May 19, 1939.  
Gr. 15, Cl. 3

The standard gas generator which is the subject of the present invention is composed of:

- (1) A generator of 3-4mm. sheet metal;
- (2) A decanter;
- (3) A purifier;
- (4) A mixer.

(1) The generator has a double wall and a grate with a firebox, covered with refractory earth, which makes it possible to open the lower or upper orifice of the purifier or of the generator without stopping the motor.

The said system is a humidifier system—that is, a reservoir of water permits water to enter automatically toward the firebox of the generator.

France 856,731

## PROCESS AND EQUIPMENT FOR THE PRODUCTION OF WATER GAS

Vergasungs-Industrie A. G., Germany

June 22, 1939. Issued Mar. 23, 1940.

Gr. 15, Cl. 3

The invention concerns a process for the production of water gas in alternating operation, in which the fuel is distilled in the upper part and gasified in the lower part of the gas generator, characterized by the fact that, during continuous production, the water gas is removed from the gas generator in the intermediary zone between the upper and lower parts of the generator, at a place located in the vicinity of the axis of the gas generator.

France 858,692

## IMPROVED PROCESS FOR THE PRODUCTION OF FUEL GAS WITH THE AID OF A GAS GENERATOR, AND INSTALLATION INCLUDING THE APPLICATION THEREOF

Roger Louis Jules Hollier-Larousse, France

May 20, 1940; application filed in Paris Apr. 27, 1939.  
Gr. 15, Cl. 3

The invention concerns principally:

An improved process for producing fuel gas with the aid of a gas generator, making it possible to notably improve total fuel gas production, the said process . . . characterized by the fact that . . . it consists of regenerating a part of the heat energy ordinarily lost; and that one or several endothermic reactions are produced in the gas generator, producing one or several fuel gases, the heat needed to maintain an appropriate temperature in the gas generator is borrowed, in the form of regeneration, from large quantities of heat lost in the atmosphere, notably by the firebox of the gas generator and the gas-outlet ducts, as well as, in the case of a motor, by the cooling of the said motor and the exhaust gases, etc.

France 858,917

## PROCESS FOR THE GASIFICATION OF PULVERIZED FUELS OR COAL IN FINE PIECES, BY MEANS OF MIXTURES OF OXYGEN AND OF WATER VAPOR

Demag A. G., Germany

May 20, 1940; application filed in Paris Aug. 9, 1939.  
Application filed in Germany Aug. 17, 1938.

Gr. 15, Cl. 3

The invention concerns a process for the gasification of pulverized fuels in a state of suspension with mixtures of water vapor and oxygen, or of air and oxygen, with the adjunction of fuel gases with water vapor, characterized by the fact that the mixture of fuel gases and water vapor highly heated is intro-

duced into the gasification shaft in one zone, and that after addition of the pulverized fuel, oxygen, or mixtures of oxygen and air, are introduced into different zones of the gasification shaft.

France 858,918

**PROCESS FOR THE GASIFICATION OF GRANULAR FUELS OR PULVERIZED FUELS WITH MIXTURES OF OXYGEN, OR OF AIR AND OXYGEN, AND WATER VAPOR**

Demag A. G., Germany

May 20, 1940; application filed in Paris Aug. 9, 1939.  
Application filed in Germany Aug. 17, 1938.

Gr. 15, Cl. 3

The invention concerns a process for the gasification of granular and pulverized fuel, in a state of suspension, with mixtures of oxygen, or of air and oxygen, and water vapor, with introduction of fuel gases to the gasification shaft, characterized by the fact that together with the water vapor necessary for gasification, fuel gases which are indirectly drawn, after accumulation, from the current of the gas from production, or from fuel gases of any origin, are fed in such quantities that, if there is a disturbance of the bringing in of combustible dust, the oxygen of the gasification agents may burn with these combustible gases, and that in this way the passage of free oxygen is prevented from entering into the current of gas produced.

France 859,774

**APPARATUS FOR THE CONTINUOUS CARBONIZATION OF HYDROCARBONACEOUS AND CARBONACEOUS MATERIALS**

Roger François, France

Sept. 16, 1940; application filed in Paris May 30, 1939.

Gr. 15, Cl. 3

(1) The invention concerns an apparatus permitting the continuous and rational treatment of hydrocarbonaceous and carbonaceous materials, and more specially, of granular and oily materials, in order to obtain perfect carbonization of the said materials, and possibly to obtain heating of the tarry gases for the purpose of treatment by cracking.

(2) The invention also concerns an apparatus according to (1) above, including:

(a) A carbonization chamber, sufficiently tight against pressure and suction constituted by a coking plate that it may undergo external heating by the gases coming from a firebox; the materials being introduced by a hopper equipped with registers and evacuated, for example, by an Archimedes' screw; and a dome placed at the upper part [of the chamber to] collect the tarry gases and direct them toward a condenser or toward cracking elements.

France 861,421

**IMPROVEMENTS IN VERTICAL RETORTS FOR THE DISTILLATION OF CARBONACEOUS MATERIALS**

West's Gas Improvement Co., Ltd., Frederick Joseph West, and Ernest West, England

Oct. 28, 1940; application filed in Versailles Nov. 6, 1939. Application filed in England Jan. 26, 1939.

Gr. 15, Cl. 3

The invention . . . is characterized by . . . the application, on the opposite sides of the top of the coking chamber, of parts having teeth or clamping dogs and able to be moved over a limited distance in such fashion as to force the teeth or clamping dogs to fit into the incandescent coke, forming cavities there, as a result, the coke is immobilized and held by the teeth or clamping dogs, which causes it to be possible to unload the coking chamber without affecting the charge contained in the carbonization chamber of the retort.

France 863,332

**IMPROVEMENTS MADE IN THE PRODUCTION OF WATER GAS**

Humphreys & Glasgow, Ltd., England

Jan. 2, 1941; application filed, by mail, Feb. 8, 1940.  
Application filed in England June 17, 1939.

Gr. 15, Cl. 3

The invention concerns a process for the manufacture of water gas consisting of causing the blowing gases to pass into a heat regenerator containing a checkerwork of refractory brick where their potential energy is developed by secondary combustion and where a part of their heat is extracted upon their emergence from the generator, and then, in a second heat-regenerator chamber containing iron, steel, or other refractory substance not subject to disintegration, which absorbs the residual heat of the products of blowing; and of using the residual heat absorbed, after the end of blowing, in order to produce steam with the aid of water injected on the iron, steel, or other nondistintegratable refractory material, steam next passes to the checkerwork of refractory bricks located in the other regenerator and is there superheated; and next through the generator, in order to effect there a backrun period.

France 864,199

**PROCESS FOR THE TOTAL GASIFICATION OF FUELS WITH A HIGH CONTENT OF VOLATILE MATERIALS**

Antoine De Lacotte. Distibois, S.A., France

Jan. 13, 1941; application filed in Saint-Étienne Nov. 21, 1939.

Gr. 15, Cl. 3

The present invention concerns a process for the total gasification of fuels with a high content of volatile materials, which is essentially characterized by:

(1) Distillation followed by the decomposition of the products of this distillation, into carbon monoxide, hydrogen, and carbon dioxide.

The said decomposition is achieved by thermal means in the presence of water vapor and [the decomposition] must be as complete as possible.

France 864,766

**PROCESS FOR THE TREATMENT OF FUELS IN GAS GENERATORS AND THE APPARATUS MAKING IT POSSIBLE TO CARRY OUT THE PROCESS**

René Bernard and Étienne Bernard, Belgium

Jan. 27, 1941; application filed in Versailles Apr. 21, 1940. Application filed in Belgium Apr. 17, 1939.

Gr. 15, Cl. 3

The invention concerns . . . a process for the treatment of fuels in a gas generator characterized by the coexistence in the latter of four separate reaction zones, a distillation zone, two combustion zones, and a reduction zone, arranged in such fashion that the reduction zone, from which the final gas is withdrawn, is included between the two combustion zones, and that the temperatures prevailing there [reduction zone] are sufficient to carry out the cracking of the distillation products and to assure the fusion of the ashes; according to this process, the distillation of the fuel is effected in the absence of air by simple radiation of the heat resulting from the subsequent operations; moreover, steam and/or hydrocarbons injections can [also] be provided.

France 864,823

**IMPROVEMENTS IN GAS GENERATORS**

Raymond Meer, France

Feb. 3, 1941; application filed by mail Dec. 23, 1939.

Gr. 15, Cl. 3

The present invention concerns improvements in gas

generators, with the objective of permitting poking of the hearth and evacuation of the slag at any time.

It consists principally of providing in the grate, or partition which separates the hearth from the airtight ashpit, moveable elements arranged so that they can be manipulated from the outside and arranging or controlling cavities which can be alternately set up in order to receive the slag, broken or detached by the relative movement of the said moveable elements, and in order to dump it into the ashpit, without establishing a direct passage or communication between the hearth and the ashpit.

France 865,231

#### IMPROVEMENTS IN GAS GENERATORS

Lucien Jean José, France

*Feb. 17, 1941; application filed Jan. 15, 1940, by mail.*  
*Gr. 15, Cl. 3*

The present invention concerns improvements in gas generators with the principal objective of permitting poking of the hearth during operation.

It consists principally of arranging below the hopper or shaft which contains the fresh fuel an independent chamber or firebox, constituted by a moveable enclosure with the tuyère, and which can undergo movements in relation to the hopper in such fashion as to be emptied into the ashpit while it retains the mass of fuel in the hopper . . . The said independent chamber, or firebox, is constituted by a pivoting drum in the gas-intake chamber, between the hopper and the ashpit, around a theoretical transverse axis coinciding with that of the tuyère, the said drum containing an opening which, in its normal or working position, assures continuity between the hopper and the firebox, and in the poking position, presents the aforementioned opening above the ashpit, while its lateral wall forms an obturator or retaining grate for the fuel in the hopper.

France 865,834

#### PROCESS FOR THE UTILIZATION OF BITUMINOUS SCHIST BY THE ADJUNCTION OF COMBUSTION-REGULATING PRODUCTS WHICH CAN THEMSELVES BE FUELS AND THE PRODUCTS RESULTING THEREFROM

Georges, Louis, Émile, and Édouard Bonnechaux, and Jean, Émile Dubeux, France

*Mar. 17, 1941; application filed by mail Feb. 13, 1940.*  
*Gr. 15, Cl. 3*

The present invention consists of a process for the use of bituminous schists characterized by the fact that one or more combustion regulators are incorporated in them, which can themselves be fuels, in order to prevent:

- (a) Irregular outbreak of fire (by combustion or explosion);
- (b) Inacceptable quantities of residues or ashes.

France 866,640

#### IMPROVEMENTS IN GAS GENERATORS

Daniel Mesure, France

*May 26, 1941; application filed in Marseille on Aug. 6, 1940.*  
*Gr. 15, Cl. 3*

The present invention concerns an improvement made in the cleaning and demounting of gas generators [consisting of] . . . An oscillating firebox attached to the body of the apparatus and withdrawable by means of a closed opening by a plate on which the tuyère is attached, the said tuyère being also, if necessary attachable to a separate and likewise demountable plate.

France 866,665

#### GAS GENERATOR

Joseph, Roger, and Marie Lamicrud, France

*May 26, 1941; application filed Aug. 8, 1940, in Niort.*  
*Gr. 15, Cl. 3*

This gas generator is composed of three essential parts which, in order of importance, are as follows: (1) A firebox; (2) A tight casing for the firebox with an orifice for evacuation of the ashes and slag; and (3) A hopper forming a fuel reservoir. These three parts are assembled by means of bolts tightly holding the three parts and two intercalating asbestos joints.

The firebox is composed of four parts assembled by welding . . .

A part of a cylindrical shape in steel sheet measuring eighteen-tenths millimeters surrounds the firebox. It supports a shaped bottom welded to the lower part of the cylindrical wall. A circular opening made in the bottom serves to empty the firebox for the evacuation of ashes and slag. This opening is closed by a lid of shaped sheet metal in which a groove with an asbestos packing serves to provide tightness for the joint. This lid is kept in place by means of three bolts arranged at 120°, welded at the bottom.

France 866,919

#### GAS GENERATOR WITH REDUCTION AGENTS

Henry Georges, France

*June 16, 1941; application filed in Paris Aug. 29, 1940.*  
*Gr. 15, Cl. 3*

The invention concerns a gas generator with a reducing agent which makes it possible to obtain gases containing a minimum of nitrogen by the use of steam in the firebox and in the reducer. It makes it possible to obtain gases rich in calories as a result of introduction of the reducing agents: hydrogen on coal at 1,000°, which achieves one of the syntheses of methane. Nickel used as a catalyst achieves another synthesis of methane.

France 867,204

#### GAS GENERATOR

Jean Legeay, France

*July 7, 1941; application filed in Paris Sept. 16, 1940.*  
*Gr. 15, Cl. 3*

The invention concerns a reverse combustion gas generator characterized by the fact that . . .

(a) A moveable flap is arranged between the fire box and the fuel-charging chamber and makes it possible to clean the firebox without causing the fuel to drop down;

(b) A lateral opening in the wall of the gas generator permits the introduction and removal of the flap and can be closed by a tight belt which is applied onto the wall of the gas generator;

(c) A grate arranged in a lateral gas-exhaust chamber forming an ashpit at the lower part of the gas generator is placed at a certain distance from the firebox in order to prevent overheating of the said grate;

(d) The said grate is integral with the door for closure of the ashpit.

France 867,325

#### IMPROVEMENTS IN GAS GENERATORS

Gilbert Lacan, France

*July 15, 1941; application filed in Paris Sept. 27, 1940.*  
*Gr. 15, Cl. 3*

The present invention concerns improvements in gas generators, and the said invention is characterized by the fact that . . .

(1) The tuyère for introducing air inside the gas generator shaft is equipped with internal blades for cooling which are integral with the wall of the tuyère;

(2) The end of these blades, toward the inside of the shaft, is fashioned like a propeller;

(3) The shaft of the gas generator is internally equipped with a lining which is moveable in several parts which are susceptible of being easily replaced.

France 867,425

#### IMPROVEMENTS MADE IN GAS GENERATORS

Jean-Marie Chapelant and André Chaumard, France  
*July 28, 1941; application filed in Paris Oct. 8, 1940.*

*Gr. 15, Cl. 3*

The present invention, concerning improvements in gas generators, is particularly characterized by . . . the firebox of any shape, in one or several parts, rests on a framework which itself rests on supports attached to the casing of the gas generator; this firebox may be constituted of pipes which permit air circulation; under the firebox a moveable, segmented grate is arranged which permits ash removal and crushing of the slag; it is controlled from outside, by hand, or mechanically, even by remote control in the course of the operation.

France 867,607

#### GAS GENERATOR WITH REGULATION OF THE TEMPERATURE OF THE GAS BY DIFFERENT HEATINGS OF THE ADMISSION AIR

Léo Sala, France

*Aug. 18, 1941; application filed in Paris Oct. 30, 1940.*

*Gr. 15, Cl. 3*

The invention concerns a system whereby it is possible to heat the inlet air of a gas generator by making it circulate on heated surfaces by means of the gases produced.

This heating can be regulated by causing the inlet air to circulate, either on all of the said surfaces, or only on part of the latter, or by causing the circulation of one part of the air on all the surfaces, and of the other part, on a part of the surfaces.

The object being to obtain outlet gases which present temperatures and consequently compositions which are not too limited for the various conditions of operation of the gas generator.

In this way, better production and greater flexibility of the gas generator are obtained. This adjustment can be made by hand or automatically, by means of a thermostat indicating the temperature of the gas produced.

France 867,722

#### GAS GENERATOR

Jean Casseville and Émile Feyens, Algeria

*Aug. 25, 1941; application filed in Algeria on Nov. 4, 1940.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A reverse combustion gas generator in which the tuyère empties at the central section of the fuel in the upper part of the firebox. The latter is composed of a conical upper section, of a cylindrical, vertical grate, and of an ashpit.

The ashes cannot fall into the bottom of the gas generator, and consequently the gas is not obliged to traverse them.

The gas expands successively in the annular spaces encircling the firebox. It loses a large part of the dust in suspension even before its emergence from the generator.

France 867,732

#### DOUBLE COMBUSTION GAS GENERATOR

Paul Racine, France

*Sept. 1, 1941; application filed in Marseille July 19, 1940.*

*Gr. 15, Cl. 3*

The present invention concerns a gas generator characterized essentially by the fact that the fuel feeds first one zone operating in reverse combustion, from which it flows next to feed a zone operating in direct combustion.

The effect of the reverse combustion is limited to the extraction and transformation of the tars and volatile products.

The fuel thus freed of its tars and volatile products feeds the part of the gas generator operating on direct combustion.

Since on reverse combustion the releasing of gas is accomplished at the lower part, and on direct combustion at the upper part, it follows that in the present gas generator, the releasing of gas of the two combustion zones, reverse and direct, is accomplished in the middle part of the apparatus, where the gases can be removed together or separately.

France 868,098

#### GAS GENERATOR

Albert, Émile Doignon, France

*Sept. 15, 1941; application filed in Paris Dec. 13, 1940.*

*Gr. 15, Cl. 3*

The present invention concerns:

(1) A process for the production of water gas by a gas generator, characterized by the fact that . . . before injecting steam into the gas generator, the said steam is brought to a temperature in the neighborhood of that for the dissociation of water . . . for this purpose the heat of the gas generator's own firebox is used; . . . the steam is produced by means of water serving to cool the air-injection tuyère or tuyères; . . . when they leave the gas generator, the gases are made to pass onto a charge of dry calcium carbide which absorbs the water contained in the gas and which introduces into this gas a certain amount of acetylene.

(2) An installation for producing water gas, characterized by the fact that . . . a set of pipes, a coil, or other heating device fed by steam is arranged against the walls of the firebox of the gas generator in contact with the incandescent zone of the fuel and is connected to a tuyère for injection [of the steam] into the gas generator.

France 868,260

#### IMPROVEMENT IN GAS GENERATORS

Ernest Guillotin, France

*Sept. 22, 1941; application filed in Rennes Aug. 28, 1940.*

*Gr. 15, Cl. 3*

The present invention concerns an improvement in gas generators characterized by:

(a) A moveable edge [on the grate], sloping in such fashion that when it is manoeuvred, the ashes and powder on its parts are moved in the direction of the exhaust grate and are evacuated by the latter; these edges can be integral with a moveable grate or can be independently moved.

(b) Another method of carrying out the invention permits the evacuation of ashes independently from the ashes of the grate by the intermediation of a grate placed around the central grate and between which there is a partition to conserve central aspiration. The lateral grate can be fixed or moveable and sloping; the two grates can be integral, moved together or separately, and their level can be independent.

France 868,550

## PROCESS FOR THE FABRICATION OF PRODUCER GAS WITH NATURAL WOOD IN A REVERSE COMBUSTION GAS GENERATOR

Société d'Étude Randupson, France

Oct. 6, 1941; application filed in Marseille Sept. 3, 1940.  
Gr. 15, Cl. 3

The present invention concerns a process for the manufacture of producer gas with natural wood in a reverse combustion gas generator, characterized by:

1. Process for gasification of natural wood by carbonization followed immediately by combustion with conservation of all the constituting elements, in particular volatile materials and hydrocarbons, enriching the caloric value of the gas, the whole being obtained by a carbonization zone followed by a reaction column, all containing fuel at a high temperature, distributed over the long path followed by the gases.

France 868,735

## IMPROVEMENTS IN APPARATUS FOR THE DRY DISTILLATION OF SCHIST, OF COAL AND OTHER MATERIALS

Aktiebolaget Industrimetoder, Sweden

Oct. 20, 1941; application filed in Versailles Oct. 28, 1939. Application filed in Sweden Jan. 19, 1939.  
Gr. 15, Cl. 3

The invention concerns:

An apparatus for the dry distillation of bituminous schist, of long-flame coal, of lignite or other carbonaceous materials, this apparatus including: a tunnel furnace with a distillation chamber and also, preferably, heating, intermediate, and cooling chambers and containing perforated conveyor surfaces for transporting through the furnace the material subjected to distillation; heating elements arranged along the length of the furnace as well as devices for the circulation and introduction of the distillation gases through the material and through the heating elements; the said apparatus is characterized by the fact that . . . the heating elements are divided into three or more sections, each section being provided with inlets and outlets for the heating gas, arranged and connected with fireboxes or other devices, in such fashion that heating gases of differing temperatures may be partially introduced, at two or more points at the end of the feed for the retort, uniformly with the material to be distilled while it passes through the furnace, and, partially, at the rear extremity of the furnace in countercurrent in relation to the material passing through the said furnace.

France 868,760

## GAS GENERATOR

Société Anonyme T.A.V.A.G., France

Oct. 20, 1941; application filed in Clermont-Ferrand Sept. 11, 1940.  
Gr. 15, Cl. 3

The gas generator which is the subject of the present invention includes:

- (A) The generator;
- (B) The purifier-condenser;
- (C) The filter.

The generator includes three parts assembled by bolts:

- (1) A hopper;
- (2) A furnace;
- (3) An air-inlet stack.

The hopper. Its rectangular cross section makes it possible to attach it:

(a) Onto the furnace without complicated connections;

(b) Onto the vehicle, without loss of space.

A reservoir of water is integral with the hopper.

France 869,130

## IMPROVEMENT IN CARBON MONOXIDE GAS GENERATORS

Jean, Frédéric, Georges, Marie, and Léon Charpentier, France

Oct. 29, 1941; application filed in Bordeaux Sept. 21, 1940.  
Gr. 15, Cl. 3

The invention concerns a gas generator unit characterized by the shape and arrangement of its mechanisms as well as by their method of manufacture.

The unit is characterized by . . . the principle of dropped edges on the peripheries of the metal sheets which constitute the walls in order to permit welding by filling of the lip formed by their juxtaposition and, simultaneously, formation inside the reservoirs of crossbars forming strainers.

The unit as a whole includes, in principle, [includes] the following elements:

A generator, a cooling circuit, a decanter, a purifier, a mixer, and a distributor.

The generator is composed of . . . a fuel reservoir, a furnace, one or several tuyères, an exhaust-type collector forming a reducing element, an exhaust nozzle, a reservoir of water, and a steam injector.

France 869,522

## GAS GENERATOR WITH COMBUSTION DIRECTED FROM THE TOP TO THE BOTTOM

Gustloff-Werke, Germany

Nov. 7, 1941; application filed in Paris Jan. 27, 1941.  
Application filed in Germany May 11, 1940.  
Gr. 15, Cl. 3

Gas generator with combustion directed from the top to the bottom, in which the gas is exhausted from the furnace through a grate, characterized especially by the fact that . . .

(a) The grate is essentially constituted in a conical or pagoda shape, and projects by its narrow extremity into the furnace;

(b) The grate is composed of flat, separate washers or rings, which are kept at the desired distance from each other by narrow interposed supports, stationary or nonstationary, and which form, as a result of their varying diameters, a stair-form body.

(c) For great heights of fuel beds in particular, the upper part of the grate presents a totally or partially cylindrical shape.

France 869,577

## IMPROVEMENTS IN GAS GENERATORS

Félix, and Charles Paviot, France

Nov. 17, 1941; application filed in Paris Oct. 8, 1940.  
Gr. 15, Cl. 3

The present invention concerns improvements in gas generators using solid fuels of all types.

The particular object of the invention is to protect the tuyères and prevent obstruction of the passage of air into the furnace, on the one hand, and of facilitating the extraction of the slag, on the other hand; and to this end, it is principally characterized by the fact that . . .

(a) The tuyère or tuyères are arranged in a pocket insulated from the fuel mass by a screen which is air permeable;

(b) The wall of the screen directly in contact with the ignited fuel is vertical, or in principle vertical, in order to facilitate sliding of the slag formed toward the grate;

(c) The lower edge of the screen is located at a certain height above the grate, in such fashion as to arrange a passage for the slag and ashes;

(d) The circular grate contains a sector arranged below the protector-screen of the tuyère and moveable



around a vertical axis in order to be able to be effaced under a fixed sector;

(e) The screen and the tuyère or tuyères, the moveable section of the grate, and the door for emptying the ashpit are located on the same side of the gas generator shaft;

(f) The gas inlet is located in the ashpit, under the fixed section of the grate, in the region of the shaft opposite the tuyères.

France 869,861

**GAS GENERATOR FOREHEARTH WITH INFUSIBLE TUYÈRE**

Louis Miaud, France

*Nov. 27, 1941; application filed at Roche-sur-Yon Jan.*

*29, 1941.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator forehearth, characterized by the fact that:

It renders the tuyère infusible by noncontact with the coal and as a result of the natural slope it is successful in imparting to it;

It permits working at a very high temperature;

It eliminates the phenomenon of the [slag] arch;

It prevents the fire from rising into the hopper;

It induces a calorific enrichment of the gas by its passage through a greater quantity of coal;

It constitutes an excellent cooler, the cleaning of which is particularly easy.

France 869,969

**IMPROVEMENTS IN GAS GENERATORS**

Albert, Alexandre, and Augustin Darche and Max Serruys, France

*Nov. 27, 1941; application filed in Paris Feb. 12, 1941.*

*Gr. 15, Cl. 3*

With application to so-called gas generator apparatus, the present invention offers the following characteristics . . . :

Simultaneous feeding of the gas generator by charging two fuels, respectively, on either side of a separation arranged on a certain length, in the direction of their flow, and in such manner that the two fuels arrive simultaneously, in an appropriate proportion, into the common reaction zone.

Mixtures of fuels can be substituted for each of the two fuels.

France 870,056

**IMPROVEMENT IN GAS GENERATORS**

Ernest Guillotin, France

*Dec. 5, 1941; application filed in Rennes Oct. 24, 1940.*

*Gr. 15, Cl. 3*

The present invention concerns an improvement in gas generators. This improvement is characterized by a perforated truncated cone permitting the dropping of the dust and arranged around the hearth wall, in such fashion that the dust on the perforations of the cone pass through the latter. The small base of the cone is located sufficiently above the central grate or bottom of the hearth to permit easy removal of the dust and ashes on and around the grate. The cone can be fixed, moveable, or moving, and the perforations of this cone can be made either on its entire periphery or on part of it. The openings of the cone can be variable.

France 870,378

**COAL GAS PRODUCER WITH AN ENRICHING SYSTEM MAKING IT POSSIBLE TO OBTAIN A GAS WITH A HIGH CALORIFIC CONTENT**

Roger Chateau, France

*Dec. 12, 1941; application filed in Paris Nov. 12, 1940.*

*Gr. 15, Cl. 3*

The present invention concerns a coal gas producer

featuring particularly for the following characteristics:

(1) The producer-gas generator is fed with air necessary for combustion by means of a dome provided with holes directing air to the center of the firebox and protected from actions injurious to the incandescent coal by a protective grate of the appropriate shape.

France 870,379

**GAS GENERATOR WITH STEAM AND AUTOMATIC IGNITION**

Rodorel, Pierre, Marie and Robert Pradel de Lamaze, and Marie, Joseph, Guy and Edouard Pradel de Lamaze, France

*Dec. 12, 1941; application filed in Paris Nov. 12, 1940.*

*Gr. 15, Cl. 3*

The present invention is composed essentially of a gas generator operating on steam dissociated by its passage over ignited coal.

By the exhaust of the engine, the water previously heated by the gas-outlet pipe is sprayed against the superheated wall of the firebox. It is transformed into vapor which is again superheated upon its passage into the space reserved around the gas collector and in the gear casing, and finally traverses the bed of glowing coal and is dissociated upon contact with it. The hydrogen released leaves the collector and, from there, goes to the engine, passing into an air mixer the regulation of which is automatically made, by a piston controlled by suction and alternately uncovering ports putting the atmospheric air and the admission piping in communication.

France 871,183

**IMPROVED GAS GENERATOR**

Jacques Jullien, France

*Jan. 10, 1942; application filed in Paris Mar. 18, 1941.*

*Gr. 15, Cl. 3*

The present invention consists of a gas generator, including a conventional reaction chamber confined to the upper part by means of a throttle device, surmounted by a feed hopper; this gas generator is characterized by the arrangement of air-injection tuyères placed above the throttle point, and the respective angles of orientation of which converge at a point locate above the throttle device.

France 872,580

**IMPROVEMENTS IN GAS GENERATORS**

Alfred Bayetto, Monaco

*Feb. 16, 1942; application filed in Nice Nov. 21, 1940.*

*Gr. 15, Cl. 3*

The invention consists of improvements made in gas generators and particularly in a tuyère-holder which is characterized by a chamber arranged at an appropriate point of the generator and which serves as support for one or several tuyères, a part or all of a cooling gas traverses the said tight chamber in such a manner that the circulation of the gas can be guided by baffles, and in such fashion as to obtain the maximum cooling of the chamber and of the tuyère or tuyères.

France 872,972

**PROCESS FOR THE RAISING OF THE CALORIFIC VALUE OF GAS FROM COKE TO A LEVEL PREDETERMINED BY THE GASIFICATION OF THE COKE IN COMPOSITIONS OF OXYGEN AND INERT GASES AND THE MIXTURE OF THE GAS OBTAINED WITH OTHER GASES**

Armand Alexandre, France

*May 2, 1942; application filed in Paris June 9, 1941.*

*Gr. 15, Cl. 3*

The present invention concerns:

The gasification of coke in oxygen, more or less ex-

panded by inert gases, with injection of steam, in places momentarily insulated from the outside air;

The possibility of effecting this gasification in the enclosure where the coke was formed;

The oxygenated compositions may come either from the process by liquefaction of the air, or by electrolysis of water, or, with a view to the utilization of the by-product nitrogen and hydrogen respectively released from these two sources for the manufacture of synthetic ammonia, mixed in such proportion that the volume of nitrogen is three times the volume of the hydrogen released by electrolysis . . .

France 873,624

**IMPROVEMENTS IN GAS GENERATORS WITH REVERSE COMBUSTION**

Joseph Bethenod, Joseph Bouteille, and Marcel Koehler, France

*Mar. 30, 1942; application filed in Paris Feb. 28, 1941. Gr. 15, Cl. 3*

The present invention concerns downdraft gas generators designed to facilitate their operation under various conditions, and to provide gas generators of high capacity, with multiple blast nozzles.

France 874,145

**GAS GENERATOR WITH DESCENDING DISTILLATION**

Reederei "Braunkohle" G.m.b.H. & Co., Germany

*Apr. 20, 1942; application filed in Paris July 23, 1941. Application filed in Germany July 29, 1940. Gr. 15, Cl. 3*

The object of the present invention is a new industrial product which constitutes a gas generator with descending distillation, in which air is fed (from the annular space included between the outside casing and the casing of the inside shaft, which is constructed in the form of a hearth the upper part of which presents a conical contraction) by means of tuyères distributed over the periphery of this hearth; the said gas generator presenting the following characteristics . . .

1. The air-inlet tuyères are inclined and discharge at the narrowest section of the upper part of the conically contracted hearth.

France 874,566

**IMPROVEMENTS IN THE PROCESSES FOR OBTAINING A MIXED GAS, MORE ESPECIALLY WATER GAS, WITH THE AID OF A FLOW OF HEATED GAS**

Karl Bergfeld, Germany

*May 11, 1942; application filed in Paris Aug. 7, 1941. Application filed in Germany Apr. 8, 1941. Gr. 15, Cl. 3*

The invention concerns a process for obtaining a mixed gas, especially water gas, synthetic gas, illuminating gas, or the like, for continuous use, with the aid of a stream of gas, of steam, or of gas steam, heated by internal combustion and passing into the gas generator. The gas to be heated can, for example, come from coke ovens or low-temperature carbonizers, or the like, or by a stream taken from the gas generator and returned to the latter in closed circuit, and containing, if necessary, steam.

The invention provides principally for the internal heating of the gas stream by means of steam, or gas steam; or detonating gas ( $H_2$  plus O); or a mixture of hydrogen and oxygen, the composition of which corresponds substantially to that of the detonating gas, so that the composition of the gas, after heating, shall remain unchanged.

France 874,673

**GAS GENERATOR**

Karl B. Halvorsen, Norway

*May 18, 1942; application filed in Paris Aug. 11, 1941. Application filed in Norway July 13, 1940. Gr. 15, Cl. 3*

The present invention concerns a gas generator for the production of generator gas with a high hydrogen content and including an admission of a small amount of air as possible [to complete the process].

This gas generator is intended to operate with wood containing a relatively high moisture content. The purpose of the invention is to use the high water content of the wood in the production of gas by directing the vapor and the gas, which are driven from the wood, and air into the combustion zone, the vapor being decomposed and the hydrogen being supplied to the gas. The addition of water vapor is relatively slight, so that the operation can take place in a constant manner.

France 875,832

**IMPROVEMENTS IN GAS GENERATORS FOR MINERAL COALS**

Jean Rolland, France

*July 7, 1942; application filed in Paris May 29, 1941. Gr. 15, Cl. 3*

The invention concerns an improvement in gas generators for mineral coals, characterized by the fact that a reduction column, equipped with refractory particles, is arranged inside the generator in such fashion that the gases, before leaving the generator, traverse the said column and bring the particles to a sufficiently high temperature to assure autocracking of the tars.

France 875,893

**SLOW CARBONIZATION FURNACE WITH SWEEPING GAS, FOR CONTINUOUS OPERATION, IN PARTICULAR FOR THE TREATMENT OF OIL-PRODUCING SHALES**

C. Otto & Co., G.m.b.H., Germany

*July 7, 1942; application filed in Paris Oct. 7, 1941. Application filed in Germany Oct. 19, 1940. Gr. 15, Cl. 3*

The present invention particularly concerns a slow carbonization furnace, with a sweeping gas, for continuous operation, arranged vertically, having a rectangular and elongated cross section, with external heating on only one side and swept internally by a transverse stream of gas, for the treatment of oil-producing shales, characterized by the fact that the gas-swept zone is followed by a distillation and cooling zone provided with cooling ducts following the direction of the length of the chamber, the ducts being provided, at their lower extremity, with special inlets for the cooling agent, as well as with rollers for withdrawing the charge from the furnace.

France 876,358

**IMPROVEMENTS IN VERTICAL RETORTS FOR THE CARBONIZATION OF COAL AND OTHER LIKE APPLICATIONS**

West's Gas Improvement Co., Ltd., England

*July 27, 1942; application filed in Paris Oct. 27, 1941. Application filed in England Sept. 14, 1940. Gr. 15, Cl. 3*

The invention concerns a device for supporting the charge in a vertical retort with intermittent operation for the carbonization of coal and other like materials and for separating the said charge from the coke to be discharged, the said device characterized by . . . the fact that:

(1) It includes a series of pointed finger bars rotating around vertical axis arranged on either side of

the base of the retort and below the latter, the simultaneous rotation of the finger bars around their axis under the action of a control, obliging the said finger bars to penetrate, for a short distance only, by their extremities pointed in front and in the form of a wedge, into the mass of coke, in which they are thus bolted, as a result of which they maintain and support the charge in the retort, the finger bars being momentarily withdrawn by a pivoting motion, which releases them from the aforementioned mass, in order to permit one part of the charge to fall into the coking chamber.

France 876,374

**STEAM GENERATOR SURROUNDING THE GASIFICATION CHAMBER OF A GAS PRODUCER**

Schmidt'sche Heissdampf G.m.b.H., Germany

Aug. 3, 1942; application filed in Paris Oct. 28, 1941.  
Application filed in Germany May 24, 1940.

Gr. 15, Cl. 3

The present invention concerns a steam generator surrounding the gasification chamber of a gas producer, characterized by the fact that the operation of the boiler is assured principally by the combustion heat of the generator gas, this gas being burned in a chamber limited by tubular casings of the generator.

France 877,186

**PROCESS AND DEVICES FOR THE ENRICHMENT OF PRODUCER GAS SUPPLIED BY A GAS GENERATOR, IMPROVED INSTALLATIONS, AND NEW GAS GENERATORS RESULTING THEREFROM, FOR THE FEEDING OF ENGINES**

Eugène-Jean-Désiré Houyez, France

Sept. 1, 1942; application filed in Paris July 22, 1941.

Gr. 15, Cl. 3

The present invention concerns:

A process for the enrichment of producer gas supplied by a gas generator, characterized principally by the main or auxiliary generation of hydrogen or hydrogenated gases and their mixture with producer gas at all appropriate points of the circuit of the latter;

All means and devices for the operating and putting into effect of this process, and all installations resulting therefrom;

All new products constituted by the main or auxiliary gas generators and their equipment deriving from the said process.

France 877,828

**DEVICE AUTOMATICALLY REGULATING THE ADDUCTION OF STEAM INTO A GAS GENERATOR IN ORDER TO DISSOCIATE IT BEFORE ITS ENTRY INTO THE FIRE-BOX**

Frédéric Georges Conod and Charles Senglet, Switzerland

Sept. 14, 1942; application filed in Lyon Feb. 10, 1941.

Gr. 15, Cl. 3

The invention concerns a device automatically regulating the adduction of steam into a gas generator in order to dissociate it before its entry into the firebox, characterized:

(1) By the fact that it contains a thermostat which is regulated so as to not allow this steam to enter, except starting with a determined temperature and above the said temperature.

France 877,837

**INVERSE GAS GENERATOR FOR TOTAL REDUCTION AND FOR POKING**

Marcel Pillard, France

Sept. 14, 1942; application filed in Marseille Feb. 12, 1941.

Gr. 15, Cl. 3

The present invention concerns a downdraft gas generator, carried out in such fashion that, owing to the

use of a bell placed in its center and, selectively, of a cylindrical or conical pipe placed under the said bell, which is itself selectively fed with additional air through its center or through its periphery, and owing to a conical, staged, or baffled arrangement of the shaft, of which the smallest opening, located below, corresponds to the discharge for the gas and ashes, gasification reactions are carried out over a long and thin zone, where heat is released, and over a centralized, thick zone where heat is absorbed and, moreover, owing to the use of a crusher placed under the gas off-take the convenient discharge of the ashes or possibly clinker, if any exists, is assured, because the latter is necessarily placed at a well-defined place of small dimensions. All these arrangements may, if desired, be connected with other known arrangements, such as, in particular, cooling of the gas by preheating the air or the fuel, injection of water or steam, etc.

France 878,047

**PROCESS FOR THE IMPROVEMENT OF THE OPERATION OF GAS GENERATORS**

Léon-François Simon, France

Sept. 21, 1942; application filed in Paris Dec. 29, 1941.

Gr. 15, Cl. 3

The invention concerns a process for the improved operation of gas generators which consists of sending into the hottest sections of the firebox, but outside the oxidation zone of the fuel by oxygen from the air, one or several bodies of such nature that they decompose and are transformed into fuel gases upon contact with the mass of fuel located in those sections.

France 878,379

**GAS GENERATOR WITH A SINGLE RETORT PRODUCING A GAS FREE OF TARS**

Schmidt'sche Heissdampf G.m.b.H., Germany

Oct. 5, 1942; application filed in Paris Jan. 9, 1942.

Application filed in Germany Jan. 10, 1941.

Gr. 15, Cl. 3

The invention concerns:

(1) A gas generator with a single retort characterized by the fact that the angle of slope of an inclined grate, located below a throttled or restricted part of the charging hopper, is greater than the angle of repose of the fuel; that in front of the inclined grate and approximately parallel thereto, there is a steep wall of the distillation retort, which extends as far as the level of the throttled part; and finally, that the outlet orifice of the end gaseous product is located at the foot of the steep wall, in such fashion that the distillation gases of the fuel must force a path from top to bottom through the incandescent bed in the gasification retort, starting from the throttled part of the charging hopper toward the outlet orifice located in the steep wall.

France 878,463

**PROCESS FOR THE PRODUCTION OF FUEL GAS WITH A HIGH CALORIFIC VALUE, BY TREATMENT, IN A GAS GENERATOR, OF A MIXTURE OF FUEL AND CARBONATE**

Henri Dupuy, France

Oct. 12, 1942; application filed in Paris Aug. 30, 1941.

Gr. 15, Cl. 3

The invention concerns a process for the production of fuel gas with a high calorific value, characterized essentially by the use, in gas generators, in addition to coal, of a carbonate, carbonate of lime, for example, which, under the action of heat, is dissociated and yields a pure gas without mixture of any inert product, in such fashion as to considerably increase the calorific value of the entire gas obtained.

The invention also includes the application of the process for the fueling of motors by the gas from the

generator, or by the obtaining of high combustion temperatures.

France 878,718

**PRECARBONIZATION GAS GENERATOR**

Paul Guignard, France

*Oct. 26, 1942; application filed in Paris Sept. 10, 1941.  
Gr. 15, Cl. 3*

The present invention concerns a gas-producer generator of the precarbonization type, and its purposes consist of carrying out the rational production of carbureted gas; its object is to remedy certain defects generally noted: lack of power, lack of flexibility, impossibility of operating with fuels of very different nature and quality.

France 878,884

**IMPROVEMENTS IN GAS INLETS OF GAS GENERATORS**

Émile-Jules Bouriez, France

*Nov. 2, 1942; application filed in Lille Sept. 22, 1941.  
Gr. 15, Cl. 3*

The present invention concerns improvements in the gas inlets of gas generators, characterized by all or a part of the following characteristics:

Gas inlet constituted by a cylindrical strainer arranged inside a gas generator and containing absorbent products, such as metallic coke, charcoal, or others;

This strainer is surmounted by a funnel and a pipe emptying into the upper part of the gas generator in a free space reserved by the flange arranged around the charging door to limit filling of the gas generator;

Arrangement of the gas-outlet pipe at the upper part of the gas generator.

France 879,739

**IMPROVEMENTS IN GAS GENERATORS**

Compagnie des Procédés Gohn-Poulenc and Jean Gohn, France

*Nov. 30, 1942; application filed in Paris Feb. 26, 1942.  
Gr. 15, Cl. 3*

The invention concerns:

(1) An improvement made in gas generators and especially gas generators with a grate for transverse coal combustion including a lateral air injection tuyère and a gas inlet which is likewise lateral. This improvement consisting essentially of advancing the gas-inlet grate as far as the very high temperature combustion zone, in such fashion as to capture the gases where the heavy hydrocarbons are destroyed and transformed into permanent gases, the said grate being provided with cooling means assuring the elimination of the excess heat toward the outside of the sections in contact with the very high-temperature zone.

France 880,356

**IMPROVEMENT IN GAS GENERATORS**

Compagnie des Procédés Gohn-Poulenc, France

*Dec. 28, 1942; application filed in Paris Mar. 20, 1942.  
Gr. 15, Cl. 3*

The invention concerns:

1. An improvement made in gas generators, and more particularly in coal gas generators containing a lateral air-inlet tuyère, this improvement consisting essentially of arranging in the front of the part of the body of the gas generator located in the vicinity of the air-inlet tuyère, a double wall which forms a jacket of air communicating with the outside air, and of connecting the interior space of this jacket with the external end of the air-inlet tuyère, in such fashion that the air induced from outside by the latter shall be forced to circulate in that space before being injected into the gas generator.

France 880,871

**GAS GENERATOR WHICH AUTOMATICALLY DECOMPOSES TARS AS SOON AS THEY ARE FORMED AND WHICH OBTAINS, BY ITS DEVICES OF EXPANSION AND FILTRATION, A VERY PURIFIED GAS**

Antoine Reynier, Felix Siccard, and Marcel Tempier, France  
*Jan. 11, 1943; application filed at Marseille Apr. 29, 1941.*

*Gr. 15, Cl. 3*

The present invention concerns a gas generator which automatically decomposes tars as soon as they are formed and which obtains, by its devices of expansion and filtration, a highly purified gas, characterized by:

(1) Conical surfaces with varying slope and temperature on which the condensations of the combustion byproducts flow. The lower conical surface conducts the tars into the hottest part of the firebox.

France 881,446

**GAS GENERATOR OPERATING WITH ALL TYPES OF SOLID FUELS**

Fabbrica Italiana Gassogeni Brevetti Torino di Ettore La Manna, S.A., Italy

*Jan. 22, 1943; application filed in Paris Apr. 22, 1942.  
Application filed in Italy Oct. 21, 1941.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator which operates with all types of solid fuels, such as charcoal, wood, lignites, etc., characterized by the fact that it includes a hearth, preferably conical, narrowing toward the lower part, the lower edge of which forms a constriction with the cone arranged on the same axis under the hearth. This constriction separates the combustion zone from the reduction zone in which the collected coal forms a cracking zone. The reduction chamber includes a radical vertical wall which connects above with a wall on one side of an annulus formed between said wall and the hopper. The gases produced by the gas producer flow through this annulus to the gas offtake.

France 881,509

**GAS GENERATOR FUNCTIONING SIMULTANEOUSLY ON DIRECT DRAFT AND INVERSE DRAFT**

André Bouilloux-Lafont, France

*Jan. 28, 1943; application filed in Paris Apr. 24, 1942.  
Gr. 15, Cl. 3*

The present invention concerns a gas generator in which the fuel, after passage into a storage chamber forming at the same time a drying and precarbonization chamber, is subjected, in its upper part, to gasification by inverse draft and in the lower part to gasification by direct draft, the departure of the gases produced being effected in the median part of the gas generator proper.

The storage chamber can, especially for operation with wood, be provided with a stack with adjustable draft in order to facilitate igniting and permit departure of steam, and also, if necessary, accomplish the drying of the wood by low combustion at the bottom of the said chamber.

France 882,579

**IMPROVEMENTS IN GAS GENERATORS**

Louis Gatel, Félix Clemençon, and Maurice Deible dit Delbois, France

*Application filed in Lyon Sept. 17, 1941.*

*Gr. 15, Cl. 3*

The invention concerns . . . improvements in gas generators . . . characterized by the fact that:

(a) Above the usual furnace tuyères, air-inlet noz-

zles are provided which, when they are put into operation, and especially in the case of the use of wood, induce partial combustion engendering a raising of temperature which is such that the wood is transformed into charcoal before arriving in the firebox, which makes it possible to use indiscriminately, in the same gas generator, all types of mineral or vegetable fuels.

France 884,525

**GAS GENERATOR WITH DESCENDING COMBUSTION FOR SOLID FUELS**

Gauger & Co. A.G., Switzerland

*Apr. 27, 1943; application filed in Paris July 28, 1942. Two applications filed in Switzerland Aug. 1 and Nov. 15, 1941.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A gas generator with descending combustion for solid fuels, characterized by the fact that it includes a vertical central pipe intended for the evacuation of hot gases from the generator, as well as a heat-exchanger apparatus arranged in the said pipe, swept externally by the hot gases of the generator and traversed internally by the comburent air led counter-current to the firebox of the generator, all the foregoing for the purpose of extracting the heat proper contained in the gases from the generator, on the one hand, by means of the wall of the central pipe to the fuel which surrounds the latter and, on the other hand, by means of the heat exchanger to the comburent air.

France 884,620

**IMPROVEMENTS IN GAS GENERATORS**

Charles-Henri Claudel, France

*May 3, 1943; application filed in Paris Mar. 24, 1942.*

*Gr. 15, Cl. 3*

The invention concerns improvements in gas generators particularly featuring the following characteristics . . .

(a) The gas generator is constituted in its ignition, combustion and reduction zones of a moveable blast nozzle in the approximate shape of a double frustum of a cone with small openings this nozzle presenting the shape, the dimensions and an arrangement of the air inlets appropriate for the fuel used at any given moment, this nozzle containing, also, means for external adjustment of at least a part of the air inlets, for example by means of a rotating collar.

France 884,783

**IMPROVEMENTS IN GAS GENERATORS**

Jacques Jullien, France

*May 8, 1943; application filed in Paris Apr. 3, 1942.*

*Gr. 15, Cl. 3*

The invention concerns:

A gas generator including, in the known manner, a reaction chamber with a throttle device at its upper part located below a feed hopper; this gas generator is characterized by the fact that the wall of the throttle device surmounts a set of pipes which penetrate inside the reaction chamber.

France 885,033

**IMPROVEMENTS IN GAS GENERATORS**

Alfred Bayetto, Monaco

*May 17, 1943; application filed in Nice Sept. 14, 1940.*

*Gr. 15, Cl. 3*

The invention concerns various improvements made in the following gas generator mechanisms:

(1) A generator which includes:

(a) A vertical tuyère conducting air from top to bottom and containing two concentric pipes: one outside pipe, having, in its upper part, air-inlet orifices

and, in its lower part, a conical nozzle; the other, an inside pipe which is closed, at its upper part, by a hinged shutter and communicating with an additional air inlet; this inside pipe can rise or descend inside the other pipe in order to regulate the passage of air;

(b) A chamber for exhausting the gases in the lower part of the generator under the ashpit into which the gas enters through symmetrically distributed chambers which are at an equal distance from the axis of the hearth; the removal of the gases is handled through a notch in a tube at the center of the chamber discharging into a dust separator of a known type, then into the purifying and cooling train.

France 885,134

**GAS GENERATOR INSTALLATION**

Marin-André Lauret, France

*May 17, 1943; application filed in April 9, 1942.*

*Gr. 15, Cl. 3*

The invention concerns improvements in gas generators, in general, and more particularly polycombustible and direct-draft generators, featuring particularly the fact that they include the following characteristics:

(a) A water reserve is arranged under the grate of the firebox of the gas generator at an appropriate distance permitting the vaporized water to induce, by its passage through the combustion zone, the formation of a gas charged with hydrogen.

France 885,257

**PROCESS FOR THE CARBONIZATION OF SOLID FUELS OF ALL TYPES AND VERTICAL OVEN FOR PUTTING THIS PROCESS INTO EFFECT**

ERIM, S.A., Switzerland

*May 24, 1943; application filed in Saint-Étienne Dec. 30, 1940. Application filed in Italy Jan. 27, 1940.*

*Gr. 15, Cl. 3*

The present invention concerns a process for the carbonization of solid fuels of all types and a vertical oven for putting this process into effect, characterized essentially by:

(1) A process for the carbonization of solid fuels of all types, mixed or not mixed with various materials such as minerals, slag, and metal materials for example, characterized by the fact that the fuel to be carbonized is charged at the upper part of a vertical oven; by the fact that combustion air is introduced on the one hand, into the median zone of this oven; and on the other hand, at the lower part of the oven a fuel gas is introduced; and by the fact that the quantities of air and gas introduced are regulated in such fashion that the combustion of a fraction of the gas is progressively accomplished in a reductive atmosphere in the median zone of the oven by raising the temperature in that zone to the level required to assure the desired carbonization.

France 885,780

**WATER-GAS GENERATOR**

I. G. Farbenindustrie A. G., Germany

*June 7, 1943; application filed in Paris Sept. 9, 1942. Application filed in Germany Oct. 2, 1941.*

*Gr. 15, Cl. 3*

The invention concerns a water-gas generator with inverse alternating operation in which the vapor passes, during cold blowing, from top to bottom through the fuel bed, characterized by the fact that the grate is conformed into a heat accumulator absorbing the sensible heat of the water gas, produced during cold blowing, and restoring this heat to the draft admitted during hot blowing.

France 885,813

## PROCESS AND APPARATUS FOR GASIFICATION OF SOLID FUELS

Gaston-Francois Saintenoy, France

*June 15, 1943; application filed in Paris May 11, 1942. Gr. 15, Cl. 3*

The present invention, relating to a gas generator and a gasification process using pulverized fuel, includes the following points:

(a) A part of the powdered fuel is introduced into a zone of the apparatus in order to produce a raising of the heat sufficient to keep the apparatus in operation with the minimum production of carbon dioxide. The combustion air can be introduced completely or only in part with the fuel, in which case the necessary supplement is introduced at a carefully chosen place in order to carry out the objective sought.

France 886,470

## GAS GENERATOR WITH INTERNAL EXPANSION

Arnold-Alfred-Alexandre Monod, France

*July 5, 1943; application filed in Paris June 4, 1942. Gr. 15, Cl. 3*

The present invention permits the construction of a gas generator in which the gases, formed in the high-temperature zone, pass freely into an enclosure where they expand without having to traverse the distillation zones; they also expand around the tuyère which they cool. In this way, it is possible to gasify all types of fuels (coal, charcoal, anthracite coal, coke, wood, peat) without carrying along the tars.

France 886,668

## IMPROVEMENTS IN GAS GENERATORS

Louis-Henri Bailu, France

*July 12, 1943; application filed in Paris June 10, 1942. Gr. 15, Cl. 3*

The present invention concerns improvements in gas generators, and more particularly, generators with filtering and cooling devices and with mixers.

According to the invention, the generator is principally characterized by the fact that it is set up in such fashion as to constitute a first annular external zone for the fuel and a second axial reduction and purification zone surrounded by the first zone with which it communicates, at the lower part, in such fashion that the fuel of the first zone progresses, under the action of the vibrations and aspiration of the engine, toward the central zone in accordance with the principle of communicating vessels.

France 886,955

## IMPROVEMENTS IN COMBINED TUYÈRES FOR GAS GENERATOR FOR PRODUCING WATER GAS

Émile-Jules Bouriez, France

*July 26, 1943; application filed in Lille June 18, 1942. Gr. 15, Cl. 3*

The invention concerns improvements in combined tuyères for gas generator for producing water gas, characterized by all or part of the following features:

The adjunction of a pipe emptying into one of the tuyères and conducting the steam coming from the fuel to the upper part of the gas generator, or steam coming from an outside source, or simultaneously from both sources;

Arrangement of a shutter opening outward to the tuyère receiving this steam-admission pipe, and of a shutter opening inward, to the blast tuyère of the firebox;

Control of the flow of vapor by shutoff devices remote controlled by any appropriate means: electrically, mechanically, pneumatically, or otherwise.

France 887,762

## ROTATING BASE FOR A DOWN-DRAFT GAS GENERATOR, FACILITATING THE FORMATION OF THE HEARTH AND AMELIORATING ASH REMOVAL WITHOUT ENTRAINING DUST IN THE GAS STREAM

Société Anonyme des Établissements Industriels D. Soulé, France

*Aug. 23, 1943; application filed in Tarbes on June 17, 1941.**Gr. 15, Cl. 3*

The invention concerns a rotating base adaptable to gas generators and making it possible:

(1) To make it easy and convenient to maintain generators even while in operation;

(2) To assure the production of ash-free gas by passing it through a sand-filled joint provided for this purpose.

France 887,791

## CONTINUOUS CARBONIZATION OVEN

Albert-René Quanquin, France

*Aug. 23, 1943; application filed at Albi on Oct. 14, 1941. Gr. 15, Cl. 3*

Continuous carbonization oven, operating by introduction through the material, in diverse zones, of masses of gas, each mass characterized by its size and temperature. These masses of gas are obtained by mixture of the combustion products of one part or of all the most combustible gases of the oven, with one part or all of the less combustible gases, which are also colder than the first gases. Possibility of handling, on the gas circuits, the removal of tar and the recovery of useful elements.

France 888,170

## IMPROVEMENT IN GAS GENERATORS EQUIPPED FOR AUTOMATIC POKING

Société Heurtey &amp; Cie, France

*Aug. 30, 1943; application filed in Paris July 24, 1942. Gr. 15, Cl. 3*

The invention concerns an improvement in gas generators equipped for automatic poking by means of a rotating basin, characterized by a sheet-metal hood which completely covers the poking basin and which is integral on the one hand with a stuffing box assuring tightness between the casing of the gas generator and the hood and, on the other hand, with a circular dome supported against the upper edge of the basin.

France 888,356

## IMPROVEMENT IN THE CONSTRUCTION OF GAS GENERATORS

Jean-Raoul-François-Marius Lasmolles, France

*Sept. 6, 1943; application filed in Agen Mar. 30, 1942. Gr. 15, Cl. 3*

The invention concerns the use for simplification of construction and maintenance of gas generators and their accessories, of joints, constituted by a liquid, a powder, a plastic material, housed in sockets in which the male part or parts to be joined with the part bearing the said socket is or are immersed. The industrial product is carried out by means of a gas generator and its accessories mounted solely or in part with this system of joints.

France 888,463

## VACUUM GAS GENERATOR

Ernst Gussow, Germany

*Sept. 6, 1943; application filed in Paris Nov. 19, 1942. Application filed in Germany Aug. 8, 1941.**Gr. 15, Cl. 3*

The invention concerns:

(A) A process for the gasification of fuels, charac-

terized by the fact that steam is introduced as a second gasification agent to the interior of a narrow point in the cross section of the hearth, throughout the entire zone of the latter, and at a uniform distance from the combustion zone.

(B) Vacuum gas generator, operating in accordance with the process described, with ascending draft, characterized by the fact that:

(1) Introduction of vapor is effected by means of uniformly distributed pipes traversing the cross section of the hearth, narrowing at the point of vapor-admission and provided with outlet orifices for the vapor, the said pipes being arranged at an appropriate spacing of 15 to 20 centimeters approximately above the grate, or above the cone of ashes.

France 889,096

**GAS GENERATOR WITH COMBUSTION DIRECTED DOWNWARD**

Gustloff-Werke, Germany

*Sept. 20, 1943; application filed in Paris Dec. 15, 1952.  
Application filed in Germany Sept. 23, 1941.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A gas generator with combustion directed downward and with a substantially cylindrical hearth, the gases of which are exhausted through a grate, characterized by a grate in the shape of a muzzle penetrating deeply into the hearth and the diameter of which is only a fraction of that of the hearth.

France 889,100

**DEVICE FOR FEEDING AND DEVICE FOR EVACUATION OF SLAG FOR HEARTH UNDER PRESSURE, OR GAS GENERATOR UNDER PRESSURE USING SOLID FUELS**

Maschinenfabrik Augsburg, Nürnberg A. G., Germany

*Sept. 20, 1943; application filed in Paris Dec. 15, 1942.  
Application filed in Germany Dec. 27, 1941.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A device for feeding and for evacuation of slag for hearths under pressure, or gas generator under pressure using a solid fuel characterized by the fact that, at the upper end and at the lower end of the hearth or of the gas generator under pressure, a lock hopper is provided, controlled by valves or slide valves and from which the compressed air is evacuated or put under pressure with the aid of mechanically activated distribution equipment.

France 889,862

**GAS GENERATOR WITH ASCENDING COMBUSTION AND INVERSE REDUCTION FOR ALL FUELS**

Paul-Émile-Henri Durand, France

*Oct. 18, 1943; application filed in Lyon May 22, 1942.*

*Gr. 15, Cl. 3*

The invention concerns a principle and system of a gas generator with ascending combustion and supplementary inverse reduction, making it possible to use all types of fuels and inducing by means of hydrogenation, a substantial enrichment of the gases, characterized by:

(1) A reduction shaft arranged inside the hearth and determining, by the ascending combustion which results therefrom, the rational carbonization of the fuels and the complete reduction of the tars and the pyrolignites, resulting in regular fuel feeding and superior production.

France 890,569

**GAS GENERATOR**

Société Anonyme Adolphe Saurer, Switzerland

*Nov. 8, 1943; application filed in Lyon July 27, 1942.  
Application filed in Switzerland Nov. 10, 1941.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A gas generator with gasification directed downward, in which the lower part of the shaft is constituted of a narrowed hearth, which terminates at a certain distance from the bottom; it is characterized by the fact that the part of the casing of the shaft situated under the air-introduction zone, and which tapers down, receives in its lower part a hearth in a truncated cone shape, the narrowest part of which is directed upward and penetrates inside the chamber of the shaft.

France 892,314

**IMPROVEMENT IN GAS GENERATORS**

Société Nouvelle des Automobiles Unic (Société Anonyme),

France

*Jan. 7, 1944; application filed in Paris Nov. 17, 1942.*

*Gr. 15, Cl. 3*

This invention concerns:

(1) An improvement made in gas generators, more especially transverse draft gas generators, for the purpose of forcing all the gases as well as the steam to pass into the high-temperature zone of the hearth, the said improvement consisting of arranging, around the gas-outlet opening, a mask or deflector, the free edge of which is next to the said high-temperature zone.

France 892,460

**IMPROVED POLYCOMBUSTIBLE GAS GENERATOR AND PURIFIER**

Gaston Estève, France

*Jan. 10, 1944; application filed at Avignon Nov. 6, 1942.*

*Gr. 15, Cl. 3*

The present invention concerns a gas generator and more particularly a purifier, of improved types, featured by the advantages which they offer and by the means which make it possible to use any type of fuel, with an optimum yield of carburent gas, and particularly, moreover, to obtain rational and total purification of the said carburent.

According to the invention, the gas generator is characterized essentially by the fact that the hearth is composed of a basin onto which the lower opening of the hopper empties, the said basin being capable, by all appropriate means, of being brought close to or moved away from the hopper in order to make the useful capacity of the hearth proportionate to the power of the motor and to the nature of the fuel used.

Also in accordance with the invention, the purifier is essentially characterized by the fact that the impurities of the gas are agglutinated, and are precipitated inside the body of the apparatus under the effect of the condensation of vapor which is freed from a layer of water surmounting the bottom of the purifier and brought to the boiling point by any conventional device for scrubbing the gas coming directly from the generator.

France 893,189

**GAS GENERATOR**

Roger Videau, France

*Jan. 24, 1944; application filed in Paris Dec. 14, 1942.*

*Gr. 15, Cl. 3*

The present invention concerns:

(1) A gas generator in which the grate of the fire-box is made in the manner of a sliding drawer with a device for manoeuvring it, in such fashion that in

causing it to slide in its guides, it is possible to uncover completely or in part the opening normally closed by the said grate and thus, particularly, evacuate the slag and cinders.

France 893,241

**PROCESS FOR ENRICHING GENERATOR GAS AND MAKING IT POSSIBLE TO USE VERY MOIST FUELS**

Pierre-Édouard-André Lheureux, France

*Jan. 24, 1944; application filed at Oran Oct. 1, 1942.*

*Gr. 15, Cl. 3*

The present invention consists of the adjunction to an ordinary gas generator of an auxiliary total combustion firebox (interior, exterior, separate, or common firebox) fed by the same fuel as the gas generator or in an ancillary fashion by a different fuel or, if necessary, even by a fraction of the gas produced.

The contribution of calories thus made to the gas generator by this auxiliary firebox has the dual effect:

(1) Of enriching the gas either by a heavy injection of water, of steam, of carbonic gas, or of a mixture of steam and carbonic gas in the generator or by the distillation, carbonization, and gasification, all at the same time, of moist fuels or fuels rich in volatile materials or by the combination of the aforementioned means.

(2) Of permitting the use of fuels held until now to be unacceptable owing to their high moisture content.

France 893,344

**GAS GENERATOR FIREBOX WITH INVERSE COMBUSTION**

Alfa Romeo Milano Napoli, Italy

*Jan. 24, 1944; application filed in Paris Apr. 7, 1943.*

*Application filed in Italy Apr. 1, 1942.*

*Gr. 15, Cl. 3*

The present invention concerns a gas generator for feeding internal combustion engines, particularly adapted for the purpose of the use of ligneous fuels. The firebox encasement walls are cooled by combustion air, before this air enters into the firebox itself, characterized by the fact that the combustion zone is narrowed down in the form of a funnel and is encased by a double distribution chamber, in which the induced primary air is forced to pass so that it sweeps the wall of the funnel in order to cool it.

This gas generator can also include the following characteristics:

(a) The cooling of the wall encasing the combustion zone is obtained by primary air circulating in countercurrent with the hot gasses;

(b) The gas emerging from the combustion zone is forced by a semispherical hood of a given height to traverse an incandescent bed of coal serving for reduction [of the gasses].

France 893,630

**GENERATOR FOR FUEL GASES UNDER PRESSURE**

Jean-Raoul-François-Marius Lasmolles, France

*Feb. 14, 1944; application filed Apr. 28, 1943 at Agen.*

*Gr. 15, Cl. 3*

Generator for fuel gases under pressure, using one or several explosion chambers where the gases are burned from distillation of the fuel with which the apparatus — is charged, mixed with comburent air or oxygen arriving in this chamber by one or several appropriate tuyères. The chamber or explosion chambers are constructed and arranged in such fashion that the combustion heat of the explosive mixture, gas and air, in this chamber or chambers, brings about the distillation of the fuel, and that the gases resulting from the said explosion, carbonic acid for the most part, are forced to traverse the bed of coal (charcoal, coke, etc.), resulting from the distillation of the fuel, producing the reaction  $\text{CO}_2 + \text{C} = 2\text{CO}$ , in order to at-

tain the outlet of the apparatus under pressure which is a function of the power of the explosions, the said power being itself conditioned, as well as the frequency of the explosions, by the proportions and arrangements of the elements of the apparatus among themselves, and by the regulation of the admission of air.

France 894,261

**IMPROVEMENTS IN THE CARBURETION OF GASES AND GENERATOR FOR PUTTING THEM INTO EFFECT**

Stora Kopparbergs Bergslags Aktiebolag, Sweden

*Mar. 13, 1944; application filed in Lyon Apr. 21, 1943.*

*Application filed in Sweden June 13, 1942.*

*Gr. 15, Cl. 3*

The present invention concerns:

(1) A process for the carburetion of a gaseous mixture rich in  $\text{CO}_2$ , particularly for the manufacture of spongy iron, in which the gaseous flux circulates in a generator in the shape of a shaft through a column of coal brought to incandescence heated by one or several electric arcs jumping inside this column which descends by gravity along the said shaft.

France 894,811

**DISTILLATION OVEN WITH HEATING SURFACE**

Brennstoff-Technik G.m.b.H., Germany

*Mar. 20, 1944; application filed in Paris May 20, 1943.*

*Application filed in Germany May 22, 1942.*

*Gr. 15, Cl. 3*

The invention concerns a distillation oven with heating surfaces, including heating walls, preferable moveable in relation to each other, and constituting among themselves the distillation chambers, characterized by the fact that:

(1) The heating walls are divided into several parts located on two or more superimposed levels and provided with separate tracks for the bringing in and evacuation of the heating agent.

France 894,889

**PROCESS AND DEVICE FOR THE LOW-TEMPERATURE DISTILLATION AND GASIFICATION OF FUELS AND BITUMINOUS ROCK**

Metallgesellschaft A.G., Germany

*Mar. 20, 1944; application filed in Paris May 24, 1943.*

*Application filed in Germany Apr. 25, 1942.*

*Gr. 15, Cl. 3*

The invention concerns a process for the low-temperature distillation and/or gasification of fuels and bituminous rock, in particular bituminous schists, asphalt rock, coal rich in ash, or the like, by slow combustion directed from top to bottom and effected by air exhausted through the said fuel and, possibly, steam; characterized by the fact that the material, after surface ignition upon its entrance, is moved in continuous or intermittent progression through a horizontal or downward-sloping chamber, in a layer having a thickness of at least 1 meter, for example.

France 895,765

**CATALYZER FAVORING THE REACTION OF GAS TO WATER AND PROCESS FOR ITS PREPARATION**

Ammoniaque Synthétique et Dérivés, S.A., Belgium

*Apr. 11, 1944; application filed in Paris June 22, 1943.*

*Two applications filed in Belgium on June 27, 1942, and Mar. 5, 1943.*

*Gr. 15, Cl. 3*

The present invention concerns a catalyzer favoring the conversion of carbon monoxide in accordance with the reaction  $\text{CO} + \text{H}_2\text{O} = \text{CO}_2 + \text{H}_2$ , and a process for the preparation of the said catalyzer, characterized by the following principles:

(1) The catalyzer is essentially composed of carbon,



of magnesium, and of potash salts, and in order to produce it, pieces of wood are impregnated first with a solution of magnesium salt, and then with ammonia water; the pieces impregnated with magnesium salt and ammonia water are dried and carbonized and the carbonization product (char-coal) is impregnated with a solution of potash salt.

France 897,433

**PROCESS FOR THE TREATMENT OF COAL OR SIMILAR MINERAL MATERIALS IN AN ASCENDING PULSATING FLOW COMBINED WITH WATER AND AIR**

Carlshütte Maschinen- und Stahlbau G.m.b.H., Germany

May 22, 1944; application filed in Lyon Aug. 31, 1943.  
Application filed in Germany Nov. 26, 1942.

Gr. 15, Cl. 3

The present invention concerns a process for the treatment of coal or mineral materials of a like nature in an ascending flow combined with water and air, according to which the flow of air is introduced in a pulsating fashion into the water in an ascending motion, the impulsions of air being preferably controlled in synchronization with the ascending course of the water.

France 898,134

**PROCESS FOR GASIFICATION AND DISTILLATION OF FUELS RICH IN ASH**

Metallgesellschaft A. G., Germany

June 26, 1944; application filed in Paris Sept. 17, 1943.  
Application filed in Germany Nov. 16, 1942.

Gr. 15, Cl. 3

The present invention concerns a process for the gasification and distillation of fuels rich in ash in shaft furnaces, in a fuel bed by slow combustion from top to bottom, consisting of charging shaft furnaces with two or several superimposed beds composed of granular material of different sizes, the size of the particles increasing from top to bottom.

France 900,968

**PROCESS AND DEVICE FOR DISTILLING AND GASIFYING PETROLIFEROUS SCHISTS AND OTHER FUELS RICH IN ASH**

Metallgesellschaft A. G., Germany

Oct. 23, 1944; application filed in Paris Jan. 5, 1944.  
Application filed in Germany Mar. 9, 1943.

Gr. 15, Cl. 3

The invention concerns a process for distilling only or for distilling and gasifying fuels rich in ash, such as petroliferous schists, petroliferous chalks, waste products or products classed as coal or similar products, by consumption of the material in a descending direction in shaft furnaces, consisting of operating shaft furnaces in a continuous fashion or by the blast method on a roller track (distillation track) during slow combustion, while at the same time they are connected to a collector system designed especially for the products in a state of gas or vapor.

France 901,590

**GAS GENERATOR WITH REVERSE COMBUSTION, IN PARTICULAR FOR SOLID FUELS WITH A HIGH TAR CONTENT, SUCH AS LIGNITES AND ANALOGOUS FUELS**

Alfred Zeuch, Germany

Nov. 6, 1944; application filed in Paris Jan. 27, 1944.  
Application filed in Germany Jan. 29, 1943.

Gr. 15, Cl. 3

The invention concerns a gas generator with reverse combustion, particularly for solid fuels with a high tar content, such as lignites, cokes, anthracites, and the like, in which the gas-inlet pipe, arranged axially

in the shaft and directed downward, is surrounded by the air-inlet pipe except for an intermediary space.

The invention is characterized by the fact that the air-admission pipe empties into an enlarged or bell-mouthed tuyère chamber, the air escaping from this chamber by openings or tuyères directed obliquely upward, in such fashion that the extension of the incandescence zone is automatically regulated according to the depression which prevails in the shaft.

France 901,944

**PROCESS FOR PREPARING WATER GAS OR SYNTHESIS GAS**

I. G. Farbenindustrie A. G., Germany

Nov. 20, 1944; application filed in Paris Feb. 14, 1944.  
Application filed in Germany Jan. 20, 1943.

Gr. 15, Cl. 3

The present invention concerns a process for producing water gas or primitive gas for the synthesis of hydrocarbons by gasification of solid fuels or by partial combustion of gas containing hydrocarbons with introduction of pure oxygen or oxygen-enriched air consisting of obtaining the necessary oxygen in a known type of installation for the breaking down of air into its components, including a low-pressure level and a high-pressure level, and of assuring the cooling of the air under high pressure in an absorption cooling machine for the operation of which the lost heat of the gas produced is used.

France 903,002

**PROCESS AND DEVICE FOR GASIFYING BITUMINOUS FUELS, IN ORDER TO OBTAIN A TAR-FREE FUEL GAS**

Koppers N.V., Netherlands

Jan. 5, 1945; application filed Mar. 24, 1944 in Paris.  
Application filed in Germany Feb. 5, 1943 in the name of the company Heinrich Koppers G.m.b.H.

Gr. 15, Cl. 3

The invention concerns a process for the gasification of bituminous fuels in order to manufacture a tar-free fuel gas, essentially characterized by the fact that the fuel is distilled first, at a high temperature, and continuously, under partial combustion, the solid residue being then subject, in the presence of the gaseous distillation products, to descending and then ascending gasification in a gasification shaft situated under the distillation apparatus, whereas the non-combustible parts come out by the bottom of the said shaft; this process can also include one or the other of the following points:

(1) For the gasification of bituminous caking fuels, the fuel is agglomerated during distillation;

(2) The gaseous products of the distillation process are completely or partially burned in the distillation chamber.

France 903,177

**CONTINUOUS OPERATION PROCESS FOR GAS GENERATORS**

I. G. Farbenindustrie A. G., Germany

Jan. 8, 1945; application filed in Paris Apr. 4, 1944.  
Application filed in Germany on Apr. 4, 1941.

Gr. 15, Cl. 3

The present invention concerns a process for the continuous operation of gas generators, the lower part of which is composed of a flat grate with an agitator rotating around the said grate and cooled by water, with oxygen and the usual gasification agents, such as steam or carbon dioxide, in particular for fuels with small-size grains, characterized by the fact that a well-consumed layer of slag is kept on the grate (including ashes) of such height that the agitator rotates virtually only in the slag.

France 903,203  
GAS GENERATOR

Heinrich Koppers G.m.b.H., Germany

Jan. 8, 1945; application filed in Paris Apr. 5, 1944.  
Application filed in Germany Feb. 15, 1943.  
Gr. 15, Cl. 3

The invention concerns a gas generator the gasification shaft of which is formed of vertical pipes united with each other, connected at the top and at the bottom to a water chamber, and in which high-pressure steam is formed, the hot reaction gases released in the gas generator shaft being evacuated by means of the intermediary annular space between the pipes of the shaft and an external envelope, characterized by the fact that the angle irons which connect the shaft pipes two by two are introduced inside the shaft into the spaces between the neighboring pipes and are connected by welding to the pipes, by the extremities of their branches adapted to the curvature of the said pipes.

France 903,337

PROCESS FOR GASIFYING GRANULAR FUELS

I. G. Farbenindustrie A. G., Germany

Jan. 10, 1945; application filed in Paris Apr. 13, 1944.  
Five applications filed in Germany on Feb. 27, Oct. 23, Oct. 25, Oct. 26, and Oct. 27, 1943.  
Gr. 15, Cl. 3

The invention concerns a process for the gasification of fuels, characterized by the fact that the gasification fluids are blown through the fuel bed from top to bottom, and that at predetermined intervals of time, after interruption of blowing downward, the fuel bed in repose is animated by a known method of a boiling motion by gasification fluids, or fuel gases, introduced from the bottom, the slag and ash produced in particular at the time of blowing downward in the upper part of the fuel bed descending then to the lower part, from whence they are evacuated outside the gas generator in the customary manner; . . .

France 904,803

PROCESS FOR THE CONTINUOUS MANUFACTURE OF WATER GAS STARTING WITH COKE BREEZE, AND A GENERATOR MAKING IT POSSIBLE TO PUT THIS PROCESS INTO EFFECT

Adolph Rittershausen, Germany

Mar. 19, 1945; application filed in Paris May 31, 1944.  
Application filed in Germany Nov. 27, 1940 in the Names of Theodor Gruber and Adolph Rittershausen.

Gr. 15, Cl. 3

The invention concerns:

(1) A process for the continuous manufacture of water gas starting with coking breeze, in a high shaft with electrically heated vertical walls, according to which the coke breeze penetrates into the shaft by the top and superheated steam arrives in the shaft from below, the speed of the vapor and the gas-vapor mixture in the reaction chamber being maintained below the speed of the coke breeze in suspension in the shaft in order to constantly obtain a vertical drop of the coke breeze, this process being further characterized by the fact that . . . the speed of passage of the steam is modified by regulating the consumption of energy of an electrically heated superheater in order to cause the superheating of the vapor to vary and, as a result, to vary its specific volume.

France 917,450

ELECTRICAL EQUIPMENT FOR UNDERGROUND GASIFICATION INSTALLATIONS

Pierre Demart, Belgium

Sept. 9, 1946; application filed in Paris Nov. 15, 1945.  
Gr. 15, Cl. 3

The present invention concerns an electrical apparatus for underground gasification installations. The objective of the invention is to make possible the control of the position of the fire zone in order to be able to direct the latter. To this end, according to the present invention, the electrical equipment includes at least one electric line starting from the [ground] surface, extending to the vicinity of the place from which the fire zone is to start, and formed of two naked wires kept apart at least in certain determined places on the course which the fire zone is to follow; short-circuiting means being provided in these places, in order to place the abovementioned wires in short circuit, these means being normally placed out of action and not entering into play except as a result of the rise in temperature produced by the fire zone when the latter arrives in the vicinity of the place where they are, a device for gauging the electrical resistance of the abovementioned line being also provided, preferably at ground level.

France 917,451

SEPARATOR FOR A MIXTURE OF HEAVY GASES AND LIGHT GASES

Pierre Demart, Belgium

Sept. 9, 1946; application filed in Paris Nov. 15, 1945.  
Gr. 14, Cl. 6

The present invention concerns a separator of heavy gases from light gases, characterized by the fact that . . . it is formed of at least two enclosures separated from each other by at least one porous partition, the first enclosure being in relation with an admission of the gas mixture and an evacuation of the heavy gases, the other with an evacuation of the light gases.

France 917,452

UNDERGROUND GASIFICATION INSTALLATION

Pierre Demart, Belgium

Sept. 9, 1946; application filed in Paris Nov. 15, 1945.  
Gr. 15, Cl. 3

The present invention concerns an underground gasification installation offering the following special features:

(1) It includes a gasification zone delimited by embankments which substantially frame it completely; at least one fire zone started at the lower part of the above-mentioned gasification zone; comburent air-inlet channels emptying at the upper part of the latter, preferably at a point far removed from the abovementioned fire zone; means for driving this air toward the said fire zone; and evacuation channels for the gases produced starting from the lower part of the gasification zone and reascending toward the surface starting from a place in this lower part, preferably far removed from the abovementioned fire zone.

France 917,453

PROCESS FOR UNDERGROUND GASIFICATION

Pierre Demart, Belgium

Sept. 9, 1946; application filed in Paris Nov. 15, 1945.  
Application filed in Belgium Feb. 28, 1945.  
Gr. 15, Cl. 3

The present invention concerns a process of underground gasification in which comburent air is led to a vein on fire, characterized by the fact . . . that the pitch of the roof overhanging the vein on fire is regu-

lated by influencing the temperature of the front in ignition formed by the said vein on fire.

France 917,454

IMPROVEMENTS IN UNDERGROUND GASIFICATION INSTALLATIONS

Pierre Demart, Belgium

*Sept. 15, 1946; application filed in Paris Nov. 15, 1945. Application filed in Belgium Feb. 18, 1945.*

*Gr. 15, Cl. 3*

The present invention concerns an underground gasification installation in which comburent air-inlet channels are provided leading to an ignited vein, and evacuation channels are also provided for the said ignited vein for the evacuation of the gases produced, and characterized by the following special features:

(1) Before arriving at the ignited vein, the comburent air-inlet channels include at least one pipe placed in at least one part of the passage, in the above-mentioned evacuation channels for the gases produced.

France 917,455

IMPROVEMENTS IN THE PROCESSES AND INSTALLATIONS FOR UNDERGROUND GASIFICATION

Pierre Demart, Belgium

*Sept. 16, 1946; application filed in Paris Nov. 15, 1945. Application filed in Belgium Feb. 28, 1945.*

*Gr. 15, Cl. 3*

The present invention concerns:

(A) A process of underground gasification in which a current of comburent air is led to a hearth in ignition constituted by an ignited vein, and characterized by . . . the fact that . . . A fluid susceptible of modifying the characteristics of the gases produced is sprayed into the flow of comburent air;

(B) An installation for putting the above-mentioned process into effect, this installation including the following special features:

(1) It includes a pipe for conducting the above-mentioned fluid, this pipe being terminated by a spraying device placed in the channels for bringing in the comburent air.

France 920,290

MANUFACTURE OF GASES CONTAINING HYDROGEN

Imperial Chemical Industries, Ltd., Great Britain

*Jan. 2, 1947; application filed in Paris Jan. 17, 1946. Application filed in Great Britain Apr. 7, 1944, in the name of Michael Henry Miller Arnold of Imperial Chemical Industries, Ltd.*

*Gr. 15, Cl. 3*

The present invention concerns a process for the production of hydrogen by reaction of water vapor with metallic iron, in substance according to the equation  $4\text{H}_2\text{O} + 3\text{Fe} \rightleftharpoons 4\text{H}_2 + \text{Fe}_3\text{O}_4$ , followed by a reduction, by a reductive agent, of the iron oxide into metallic iron for the purpose of its reutilization in the process, characterized by the following points:

(1) The stage of hydrogen production and the stage of reduction of the iron oxide are carried out in separate receptacles, the metallic iron and/or the iron oxide in the form of small particles being kept in the form of a fluid bed or layer.

France 920,498

IMPROVEMENTS IN GAS GENERATORS

Pierre Cabany. La Soudure Autogène Française, France

*Jan. 4, 1947; application filed in Paris Dec. 9, 1940.*

*Gr. 15, Cl. 3*

Improvements in gas generators, consisting essentially of a shaft, the lower part of which is surrounded by the air box, this shaft being connected to the air-inlet piping by an expansion part containing a valve box, as well as a chamber for purifying the gas manu-

facture, by washing it through water and arranging it at the bottom of the purifier for solid materials, plugs of cork, for example.

France 921,571

GAS GENERATOR WITH TUYÈRE AND CONTINUOUS OPERATION

Pierre Pascot, France

*Jan. 13, 1947; application filed in Paris Oct. 27, 1942.*

*Gr. 15, Cl. 3*

The invention concerns a gas generator with tuyère for solid fuels, ores, etc., offering the following special features:

(1) For the purpose of permitting long, continuous operation of the gas generator, the grate is rotating, has several pockets formed by the bars, and contains cutting bars to detach, on cutting edges of the bottom of the firebox, the ashes or slag which, by rotation or tilting of the grate from outside, are led, by the pockets, to fall into the ashpit.

France 922,383

IMPROVEMENTS IN GAS GENERATORS

West's Gas Improvement Co., Great Britain

*Jan. 27, 1947; application filed in Paris Feb. 14, 1946. Two patents filed in Great Britain Jan. 4, 1945, and Jan. 4, 1946, in the names of Frederick Joseph West, Ernest West, and West's Gas Improvement Co., Ltd.*

*Gr. 15, Cl. 3*

The invention is particularly concerned with a gas generator particularly characterized by the fact that:

(a) A grate in the form of a perforated propeller or spiral is supported inside and pulled along by a cylindrical casing, which is itself pulled into rotation by appropriate means, in such fashion as to cause the grate to rotate, this casing being held laterally by rollers, and also rolling on other rollers and an hydraulic guard forming a tight joint between the upper part of the casing and the bottom of the generator.

France 922,414

PRODUCTION OF GENERATOR OR PRODUCER GAS

Imperial Chemical Industries, Ltd., Great Britain

*Feb. 3, 1947; application filed in Paris Dec. 6, 1945. Two applications filed in Great Britain on June 2, 1944 and June 1, 1954*

*Gr. 15, Cl. 3*

The present invention concerns a process for the production of generator gas of the type in which the coal is carbonized and is then treated by oxygen (or a gas containing oxygen) for the production of gas, this process being characterized by the fact that:

(I) The stages of carbonization and production of gas are carried out in separate receptacles, the solid material of the two stages being kept in a fluid state by preventing the production, in the carbonization stage, of entrainment.

France 923,925

IMPROVEMENTS IN INSTALLATIONS FOR THE PRODUCTION OF WATER GAS

William Lindsay Burns and James Waite Gibson, Great Britain

*Feb. 24, 1947; application filed in Paris Mar. 18, 1946.*

*Gr. 15, Cl. 3*

The present invention concerns an installation for the production of water gas, this installation being characterized by the fact that it includes, in combination: a generator chamber of prismatic shape, for the most part constructed of brickwork and with a deep fuel bed, the brickwork extending progressively, to the top of the generator, toward the center, with a

central opening for charging the fuel which is normally closed by a door, a lateral wall of the generator presenting a channeling in the form of a duct in which a steam superheater is housed, suitable for supplying superheated steam to the generator; a system of pipes for withdrawing gas controlled by a shutter and connecting the generator to a drum or washing chamber with an outlet orifice which communicates, by means of a reservoir, with a main pipeline for crude gas; finally, a pilot pipe connecting the gas outlet to the main pipeline for crude gas.

France 928,636

**PROCESS FOR THE GASIFICATION OF LOW-GRADE FUELS AND GAS-GENERATOR FIREBOX ESPECIALLY DESIGNED FOR THIS PURPOSE**

Société à Responsabilité Limitée Heurtey & Cie, France  
June 9, 1947; application filed in Paris June 8, 1946.  
Gr. 15, Cl. 3

The present invention includes particularly:

(1) A process for the gasification of lower-grade fuel consisting of feeding fuel continuously to the bottom of the shaft of the gas generator, of admitting at the top of the latter the comburent under pressure or suction, of removing the gas produced in the middle region of the shaft, and of evacuating the waste in a continuous fashion at the top of the shaft by means of a mechanical raking device.

France 928,646

**COMBINED GAS AND STEAM GENERATOR FOR WATER GAS AND AIR GAS, WITH USE OF A TUBULAR STEAM BOILER**

Carl Marischka and Wilhelm Horak, Germany  
June 9, 1947; application filed in Paris Jan. 24, 1942.  
Application filed in Germany Jan. 24, 1941.  
Gr. 15, Cl. 3

The invention concerns a combined gas and steam generator for air gas and water gas, with use of a tubular steam boiler, offering the following characteristics:

(1) The water from the boiler is directed in a forced or controlled way through the tubular casing of the gas and steam generator.

(2) An organ of circulation which is intercalated in the circuit of water to create a forced or controlled stream of water from the boiler, with direct production of steam, or forced or controlled circulation with indirect production of steam, this circuit being composed in the first case of the tubular casing of the steam boiler and of the steam collector (upper boiler) and being connected to the casing by input and out-take pipes; whereas, in the second case, instead of the collector of steam itself, a coil mounted in the water chamber of the latter is intercalated in the circuit.

France 928,779

**IMPROVEMENTS IN GAS GENERATORS**

Pierre Cabany, La Soudure Autoène Française, France  
June 16, 1947; application filed in Paris June 9, 1942.  
Gr. 15, Cl. 3

The present invention concerns improvements in gas generators with reverse draft with one or several horizontal rows of tuyères, with heating by means of the air produced by the gas, consisting of the following points:

(1) The air collector feeding the tuyères and surrounding the firebox is divided by a vertical concentric partition into two compartments which communicate with each other through an orifice, preferably diametrically opposite the air-inlet orifice in the outer compartment.

France 928,780

**IMPROVEMENTS IN GAS GENERATORS**

Pierre Cabany, La Soudure Autoène Française, France  
June 16, 1947; application filed in Paris June 9, 1942.  
Gr. 15, Cl. 3

The invention consists of improvements in gas generators with reverse draft with one or several horizontal rows of tuyères, with regulation of the air-passage orifices, consisting of the following points:

(1) The tuyères, which are preferably in the form of a horizontal slot, are provided with closures which can slide in front of the orifices of the tuyères, and which are integral with a ring capable of moving around the axis of the gas generator by the maneuvering of an outside lever.

France 931,267

**PROCESS AND DEVICE FOR CONTINUOUS PYROGENERATION OF PULVERIZED OR GRANULATED MATERIALS**

Compagnie de Fives-Lille, France  
Oct. 6, 1947; application filed in Paris Oct. 22, 1945.  
Gr. 15, Cl. 3

The invention concerns a process and a device for the pyrogenation or the pyrolysis of pulverized or granulated materials, essentially characterized by the fact that . . . the pulverized material to be treated is continuously swept along by a gaseous flux put into forced circulation at an appropriate speed in order that the material may be held in suspension, and that the gas and material which it carries may pass into a nest of pipes heated externally, for heating the material, this being done thus very progressively and very regularly by the intermediation of the conductive gas.

France 932,017

**SHUTTER DEVICE FOR INTRODUCING SOLID FUELS INTO GAS GENERATORS UNDER PRESSURE**

Brown, Boveri & Co., Switzerland  
Nov. 17, 1947; application filed in Paris Aug. 8, 1946.  
Application filed in Switzerland Aug. 9, 1945.  
Gr. 15, Cl. 3

The invention concerns a shutter device for introducing fuels of a solid nature into gas generators under pressure, particularly those which supply gas to furnaces which also operate under pressure, and characterized by the fact that it consists of a chamber provided with inlet and outlet mechanisms, in which chamber a pressure is maintained which is made to agree with that which prevails at the point of consumption of the gas produced.

France 932,786

**PROCESS FOR THE PULVERIZATION OF SOLID BODIES AND IN PARTICULAR OF SOLID FUELS MAKING THEIR COMBUSTION POSSIBLE, AS WELL AS THEIR GASIFICATION OR THEIR DISTILLATION IN PULVERIZED FORM**

Fernand Pesez, France  
Dec. 1, 1947; application filed in Paris Aug. 26, 1946.  
Gr. 15, Cl. 3

The present invention concerns:

(a) A process for the pulverization of solid bodies making it possible to obtain a very high degree of fineness of grain and capable of being used for all materials which can be crushed into larger pieces beforehand, this process consisting of placing the solid body in a gas under pressure, then of suddenly causing the expansion of the latter in such fashion that the gas imprisoned inside the particles tends to escape suddenly, thus causing the pulverization of the material, the said pulverization being further favored by the collision of the particles against the wall of the apparatus.

France 933,719

## PROCESS FOR THE PREPARATION OF FUELS

Standard Oil Development Co., U.S.A.

Jan. 5, 1948; application filed in Paris Sept. 18, 1946.  
Application filed in the U.S.A. on Dec. 22, 1945, in the name of Frank E. Blair.

Gr. 15, Cl. 3

The invention concerns a process for the transformation of nonvolatile carbonaceous materials into volatile fuels of an advantageous nature, characterized by the following points, separately or in combinations:

(1) These carbonaceous materials are subjected to thermal treatment consisting of a gasification reaction with steam, in such fashion as to obtain CO and H<sub>2</sub>; the CO and H<sub>2</sub> are made to undergo a catalytic treatment in order to obtain hydrocarbons which are normally liquid and a fuel gas; the liquid hydrocarbons are collected and at least a portion of the fuel gas is recycled in the aforementioned thermal treatment.

France 934,047

## TREATMENT OF FUELS

Standard Oil Development Co., U.S.A.

Jan. 7, 1948; application filed in Paris Sept. 30, 1946.  
Application filed in the U.S.A. Nov. 23, 1945, in the names of Bruno E. Roethel and Charles E. Hemminger.

Gr. 15, Cl. 3

The present invention concerns:

(I) A process for the obtaining of volatile fuels starting with carbonaceous nonvolatile fuels, characterized by the following points:

1. The nonvolatile finely divided carbonaceous material is subjected, in the form of a mass of solid, dense, fluidified materials in effervescence, to at least two thermal treatments at different temperatures; the nonvolatile carbonaceous materials are subjected to conversion into volatile products by at least one of these thermal treatments; and at least a part of the heat required is supplied for at least one of these treatments in the form of sensible heat of the volatile products of at least one other of these treatments.

France 935,142

## PROCESS FOR THE PREPARATION OF FUEL GAS

Standard Oil Development Co., U.S.A.

Jan. 19, 1948; application filed in Paris Oct. 26, 1946.  
Application filed in the U.S.A. Dec. 29, 1945, in the name of Donald L. Campbell.

Gr. 15, Cl. 3

The present invention concerns:

(A) A process for the preparation of fuel gases of high calorific value, characterized by the following points:

(1) A mixture of gas containing carbon monoxide and hydrogen is made to pass at a high temperature into a transformation zone containing a fluidized mass which is also dense and extremely turbulent, of solid catalyzer in a state of fine division susceptible of inducing the transformation of the carbon monoxide and the hydrogen into normally gaseous hydrocarbons, and the normally gaseous hydrocarbons are collected in the said transformation zone.

France 935,865

## IMPROVED METHOD FOR TREATING FUELS

Standard Oil Development Co., U.S.A.

Feb. 9, 1948; application filed in Paris Nov. 13, 1946.  
Application filed in the U.S.A. Dec. 28, 1945, in the name of Edwin J. Gohr.

Gr. 15, Cl. 3

The invention consists of . . . a process for the

manufacture of volatile fuels starting with solid carbonaceous materials, characterized by the following points:

(1) It consists of maintaining a zone of transformation of finely divided solid carbonaceous materials in the state of a fluidized, dense, solid mass in violent agitation, under transformation conditions suitable for the production of volatile fuels; of feeding the said transformation zone with finely divided carbonaceous solid materials; of evacuating the fluidized solids from the said transformation zone at a point substantially distant from the point where the carbonaceous material is introduced; of limiting the free circulation of the solids in the midst of the said fluidized mass along the entire course between the said point of feeding and the said point of evacuation; and of withdrawing the volatile fuels from the said transformation zone.

France 936,259

## GASIFICATION OF COAL

Standard Oil Development Co., U.S.A.

Feb. 16, 1948; application filed in Paris Nov. 22, 1946.  
Application filed in the U.S.A. Apr. 18, 1946.

Gr. 15, Cl. 3

The present invention concerns an improved gasification process for carbonaceous materials, characterized by the following points:

(A) The temperature in a reaction zone is obtained for the purpose of an endothermic reaction in which the carbonaceous materials in a fluid state enter into reaction, by withdrawal of one part of the said carbonaceous materials from the reaction zone; contact of the said materials with air under combustion conditions for a relatively short time; separation of the reaction gases and returning of the heated carbonaceous material into the reaction zone . . .

(B) Apparatus for gasification of coal including a water-gas generator, devices for introducing the carbonaceous material and steam into the said generator, devices for evacuation, at the top, of the reaction products, devices for withdrawing a part of the coal at the base of the said generator, devices for introducing air into the said devices for withdrawing the coal, a cyclone separator, and a relatively short device between the air-introduction device and the cyclone separator, and devices for returning the coal from the base of the said cyclone separator to the said generator.

France 939,353

## PROCESS FOR THE TREATMENT OF FUELS

Standard Oil Development Co., U.S.A.

Apr. 19, 1948; application filed in Paris Sept. 24, 1946.  
Application filed in the U.S.A. on Dec. 18, 1945, in the names of Frank T. Barr, Bruno E. Roetheli, and Walter Scharmann.

Gr. 15, Cl. 3

The present invention concerns a process for the production of heat by combustion of solid carbonaceous materials with oxidant gases, characterized by the following points:

(1) The solid carbonaceous materials are subjected to combustion in a bed with a relatively high carbon content, in such fashion as to yield fuel gases containing a substantial proportion of CO, and these gases are made to pass into at least one bed of solid materials with a relatively low carbon content, under combustion conditions which give rise to a substantially complete conversion of the CO into CO<sub>2</sub>.

France 941,105

## IMPROVEMENT IN GAS GENERATORS WITH REVERSED DRAFT

Jean-Eugène-Désiré Houyez, France

*June 28, 1948; application filed in Paris Oct. 18, 1944.  
Gr. 15, Cl. 3*

The invention concerns gas generators with reverse draft, and the improvement which is the subject of the invention has the objective or main industrial result of permitting, as a function of the flow of gas, the regulation of the volume of the zone of reduction and cracking which these gas generators contain.

To solve this technical problem, the improvement is principally characterized by the fact that the reduction zone and the cracking zone are limited by at least one perforated wall, the openings of which are combined with regulatable obturation means. By this means, the operator of the gas generator is enabled to cause the active volume of the said zone to vary at any time by obturation or removing the obturation from certain ones of these openings.

France 941,583

## GAS GENERATORS, SPECIAL UNITS AND ARRANGEMENTS

Georges Lcfond, Cochín, China

*July 26, 1948; application filed in Saigon June 29, 1942.  
Gr. 15, Cl. 3*

The present invention concerns gas generators in general and particularly those for touring cars, both as to their shape and as to their special construction and appearance characteristics. The gas generators described contain in a single compact block the accessories usually distributed throughout the vehicle; with the hopper, [and the] firebox, there are in the apparatus the chamber or chambers for expansion, the dust-removal system, and the cooling elements and even, in another method of carrying out the invention, the hydraulic filtering system.

France 940,694

## PRODUCTION OF CARBON MONOXIDE

Imperial Chemical Industries, Ltd., Great Britain

*May 31, 1948; application filed in Paris Feb. 14, 1947.  
Application filed Great Britain Feb. 15, 1946, in the names of Imperial Chemical Industries, Ltd., Gordon Nonhebel, and Michael Henry Miller Arnold.  
Gr. 15, Cl. 3*

(I) The present invention concerns a process for producing a gas containing carbon monoxide by the reaction, at a high temperature, of a solid carbonaceous fuel with oxygen or a gas containing oxygen, this process being characterized by the following points:

(1) It consists of carrying out the reaction in the presence of a halogen and/or halogenated compound, the said halogen and/or the said halogenated compound being present in a quantity at least equal to that (critical quantity) below which no substantial improvement is noted in the production of gas containing carbon monoxide.

(II) The present invention also concerns the gases containing carbon monoxide which were obtained by the putting into effect of the process specified under (I) above.

France 940,695

## STABILIZATION OF GASEOUS MIXTURES CONTAINING CARBON MONOXIDE AND OXYGEN

Imperial Chemical Industries, Ltd., Great Britain

*May 3, 1948; application filed in Paris Feb. 14, 1947.  
Application filed in Great Britain Feb. 15, 1946, in the names of Imperial Chemical Industries, Ltd., Gordon Nonhebel, and Michael Henry Miller Arnold.  
Cl. 3, Gr. 15*

The invention concerns:

(I) A process for the stabilization of gaseous mix-

tures containing carbon monoxide and oxygen for the purpose of protecting these mixtures against combustion and explosion of an undesired nature and likely to occur when these mixtures are exposed to high temperatures, the said process being characterized by the following points:

(1) It consists of assuring the presence, in the gaseous mixture, of a halogen and/or a halogenated compound in a quantity at least equal to that ("critical quantity") below which a substantially complete stabilization has not been achieved; . . .

(II) As new industrial products, gaseous mixtures containing carbon monoxide and oxygen, whenever these mixtures are exposed to high temperatures in the presence of halogen and/or a halogenated compound, in a quantity at least equal to the "critical quantity" defined above.

France 942,158

## IMPROVEMENTS IN THE MANUFACTURE OF WATER GAS OR GAS CONTAINING A HIGH PERCENTAGE OF CARBON MONOXIDE AND HYDROGEN

Humphreys &amp; Glasgow, Ltd., Great Britain

*Sept. 13, 1948; application filed in Paris Jan. 16, 1947.  
Two applications filed in Great Britain Jan. 17 and and Dec. 18, 1946.**Gr. 15, Cl. 3*

The invention concerns a cyclical process for the manufacture of gas in which air, steam—or other gases—sent to the generator, are heated in a regenerator located between the generator and the heat exchanger, by the gaseous products resulting from the passage of air and of that steam into the generator.

This arrangement reduces the extent and rapidity of the cyclical fluctuations of the temperature of the gaseous products and of the nondecomposed steam passing from the generator to the heat exchanger with rising circulation (from bottom to top).

France 946,383

## PROCESS AND APPARATUS FOR GASIFICATION OF SOLID OR LIQUID FUEL

Gaston-Francois Scintenoy, France

*Dec. 20, 1948; application filed in Paris Apr. 30, 1947.  
Gr. 15, Cl. 3*

The present invention, relating to a process and apparatus for the gasification of solid or liquid fuel, encompasses the following points:

(a) The gasification of hydrocarbons by cracking is handled in an apparatus patented under 875,870, or any other apparatus permitting of obtaining the same result;

(b) The support material serving for the cracking of the hydrocarbons falls directly into a gas generator of a known type, or preferably in that described in Patent 885,813;

(c) One or several liquid or gaseous fuels, steam, or any other element capable of producing a carburent can be admitted into the gas generator.

France 948,070

## MANUFACTURE OF CARBURETED WATER GAS AND AROMATIC HYDROCARBONS IN VERTICAL CHAMBERS AND RETORTS OF GAS PLANTS

Procédés Industriels et Charbons Actifs. (P.I.C.A.), France  
*Jan. 24, 1949; application filed in Paris May 31, 1947*

The invention concerns a process for the manufacture of carbureted water gas consisting of using vertical ovens and retorts of gas plants with the apparatus commonly used for the production of gas from the distillation of coal; and a process for the manufacture

of aromatic hydrocarbons by cracking of petroleum oils, of lignites, or of bituminous schist, consisting of using chambers or retorts for distillation in gas plants, where at the same time water gas is produced, the gaseous mixture being next treated in an activated coke bed where the fraction rich in aromatic hydrocarbon is extracted.

France 948,501

**MANUFACTURE OF WATER GAS**

Standard Oil Development Co., U.S.A.

*Application filed in Paris June 23, 1947; patent issued Jan. 31, 1949. Application filed in the U.S.A. Aug. 15, 1946, in the names of Frank T. Barr and Karl J. Nelson.*

*Gr. 15, Cl. 3*

The present invention concerns a process for the manufacture of gaseous mixtures containing carbon monoxide and hydrogen, starting with carbonaceous materials and steam, characterized by the following points:

(1) The steam is placed in contact, at the gasification temperature, with a solid carbonaceous material with high chemical reactivity;

(2) The said carbonaceous material is low-temperature carbonization coke obtained at a temperature not substantially exceeding 538° C., or any material obtained by treatment of carbonizable solids at a temperature not exceeding 538° C.;

(3) The carbonized material is in a state of dense fluidized mass which is violently agitated.

France 949,986

**MANUFACTURE OF MIXTURES OF GAS CONTAINING CARBON MONOXIDE AND HYDROGEN**

Standard Oil Development Co., U.S.A.

*Mar. 14, 1949; application filed in Paris July 15, 1947. Application filed in the U.S.A. Aug. 8, 1946, for two patents, the first in the name of Frank T. Barb and Homer Z. Martin; the second in the name of Walter G. Scharman.*

*Gr. 15, Cl. 3*

The present invention concerns the manufacture of mixtures containing carbon monoxide and hydrogen starting with nonvolatile carbonaceous mixtures such as coal, coke, peat, schist oil, residues of heavy oil, cellulosic materials such as lignin and the like, and more particularly to the manufacture of mixtures of gas which are suitable for synthesis by catalysis of hydrocarbons starting with carbon monoxide and hydrogen.

France 953,587

**PROCESS FOR THE GASIFICATION OF SOLIDS WITH A CARBON BASE**

Standard Oil Development Co., U.S.A.

*May 23, 1949; application filed in Paris Sept. 29, 1947. Application filed in the U.S.A. Dec. 18, 1946, in the name of Karl J. Nelson.*

*Gr. 15, Cl. 3*

The present invention concerns a process for the transformation of solid carbonaceous fuels into gas containing carbon monoxide by means of an endothermic reaction with the aid of a gasifying gaseous medium fed into a transformation zone at a high transformation temperature, the said process being characterized by the following points.

(1) The carbonaceous solids are placed in contact with the said gasifying medium at a transformation temperature in the said transformation zone; the gaseous product of the said transformation zone is evacuated therefrom; the solid carbonaceous residues of gasification are evacuated from the said transformation zone; at least a part of the said residue is sub-

jected to combustion by means of a comburent gas in a combustion zone at a combustion temperature higher than the fusion point of the ashes of the said carbonaceous solids and with a proportion of comburent gas at least sufficient to completely burn the carbonaceous constituents of the part of the said residue subjected to the said combustion; the liquid ashes are evacuated from the combustion zone and the heat produced in the combustion zone is transported to the transformation zone, in such fashion as to supply at least a part of the heat required for the said reaction.

France 956,298

**IMPROVEMENTS MADE IN GAS GENERATORS WITH DESCENDING CIRCULATION, PREFERABLY FOR THE GASIFICATION OF WOOD, OF PEAT, OR OF LIGNITE**

Hans Lutz Gaserzeuger und Landmaschinenbau O.H.G. Entwicklungsstelle des Reichsamts für Wirtschaftsausbau, Germany

*July 25, 1949; application filed in Paris July 25, 1944. Three applications filed in Germany: the first July 26, 1943 and the second and third on Jan. 6, 1944.*

*Gr. 15, Cl. 3*

The invention concerns improvements in gas generators with descending circulation, preferably for the gasification of wood, peat, or lignite, the said improvements . . . consisting particularly:

Of welding onto the casing, forming the charging hopper, a wall delimiting an annular space for the distribution of air and of fixing rigidly to the lower part of this wall a firebox basket, suspended freely and lined with refractory bricks which extend as far as the vicinity of the said annular space and which can be removed from below, all the metal parts being made of ordinary sheet iron.

France 956,303

**GAS GENERATOR**

H. C. Porsche, K.-G., Germany

*July 25, 1949; application filed in Paris Aug. 7, 1944. Application filed in Germany Aug. 7, 1943.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A gas generator for bituminous fuels with peripheral tuyères for introducing combustion air into the firebox, characterized by the fact that the air tuyères make, with the radius of the firebox, angles situated on a horizontal plane, in such fashion that the extensions of the axes of the air tuyères are tangent to a circle concentric to the axis of the firebox.

France 957,207

**IMPROVEMENTS MADE AND RELATING TO PROCESSES OF GASIFICATION BY CONTINUOUS OPERATION OF CARBONACEOUS MATERIALS, PARTICULARLY FUELS AND BITUMINOUS SCHISTS**

Karoly Koller and Ferenc Esztergaly, Hungary

*Aug. 22, 1949; application filed in Paris Dec. 12, 1947. Application filed in Hungary Oct. 26, 1942.*

*Gr. 15, Cl. 3*

The invention extends especially to the following characteristics:

(1) Process for gasification by continuous operation of materials containing coal and, in particular, bituminous fuels and bituminous schists, by using a gaseous gasification medium containing combined oxygen, in the practically complete absence of free oxygen, characterized by the fact that the gasification is achieved in an electromagnetic space, the heat necessary for gasification being supplied indirectly by the energy resulting from electric induction.

France 957,449

PROCESS FOR THE MANUFACTURE OF A SYNTHESIS GAS  
Texaco Development Corporation, U.S.A.

Aug. 22, 1949; application filed in Paris Dec. 18, 1947.  
Application filed in the U.S.A. Dec. 19, 1946, in the  
names of Dubois Eastman and Léon P. Gaucher.

Gr. 15, Cl. 3

The present invention concerns a continuous process for the production of a synthesis gas containing carbon monoxide and hydrogen starting with a raw material of hydrocarbon and oxygen, in the absence of all external heating and without a notable formation of carbon. This process is characterized by the fact that:

(a) It consists of establishing a reaction zone having the shape of a generally cylindrical space which is nonobstructed, in which the ratio of the length to the radius is approximately 0.67 to 10, the carbonaceous material and the oxygen to be introduced in that space in a continuous manner in order that they may mix there and react exothermically in a determined zone of that space; the reaction of the products of that exothermic reaction to be pursued following an endothermic reaction, in the space surrounding the zone of exothermic reaction, in order to use the heat released by the latter, and of evacuating continuously from this zone of reaction a current of reaction products containing essentially carbon monoxide and hydrogen.

France 960,029

INSTALLATION FOR THE CONVERSION OF WATER GAS  
Montecatini (Società Generale per l'Industria Mineraria e  
Chimica), Italy

Oct. 17, 1949; application filed in Paris Jan. 20, 1948.  
Application filed in Italy Nov. 15, 1947.

Gr. 15, Cl. 3

The invention concerns an installation for the conversion of water gas, characterized essentially by the fact that the catalytic converter is arranged immediately at the outlet of the gas from the generator, with interposition only of a dust-removal apparatus.

The installation, according to the invention, can also contain one or several of the following characteristics:

- (1) The generator is of the continuous gasification type;
- (2) The fuel feed to the generator is automatically controlled;
- (3) The catalyzer used for conversion is of the type impervious to sulphur;
- (4) The heat of the gas emerging from the generator serves to start the catalytic reaction in the converter;
- (5) The steam which accompanies the gas at the outlet from the generator is used to convert the said gas;
- (6) Additional vapor is injected into the mixture of gas and vapor to be converted.

France 961,308

IMPROVEMENTS MADE IN GAS GENERATORS WITH A  
SINGLE TUYÈRE AND RAPID AIR JET

Reichsamt für Wirtschafts-Ausbau, Germany

Nov. 21, 1949; application filed in Paris Mar. 17, 1944.  
Application filed in Germany Feb. 15, 1943.

Gr. 15, Cl. 3

The invention concerns improvements made in gas generators with a single tuyère and with a rapid air jet in order to form a gaseous mixture rich in hydrogen starting with fuels low in tar and with the addition of water vapor to comburent air, the said improvements . . . consisting particularly:

Of adopting as a tuyère, extending into the fuel, and cooled by water vapor added to the air, a part having a thin wall and a small outside diameter, so that its free edge has the form of a sharp angle; of encircling the gasification zone thus formed directly by a basket with a small cross section in the case of gasification with counterflow, or with equiflow, or of limiting this zone by one or several screens placed on the passage of the gas in the case of gasification by transverse flow.

France 962,006

## MANUFACTURE OF CARBURETED WATER GAS

Imperial Chemical Industries, Ltd., Great Britain

Nov. 28, 1949; application filed in Paris Feb. 25, 1948.  
Application filed in Great Britain Feb. 28, 1947 in  
the names of Gordon Nonhebel and Imperial Chemical  
Industries, Ltd.

Gr. 15, Cl. 3

The present invention concerns:

(1) A process for the thermal treatment of a mineral oil for the purpose of producing hydrocarbon gas and/or vapor characterized by the following points:

(1) It consists of causing atomized oil, or finely vaporized, to pass through a bed of solid material characterized by the fact that it has a high temperature and that it is kept in the form of a "fluid bed".

(2) The specially characterized bed is kept "in a fluid stated" by the passage, through the said bed, of a flow of water vapor.

France 964,242

IMPROVEMENTS IN THE MANUFACTURE OF BLUE WATER  
GAS

E. I. Dupont De Nemours &amp; Co., U.S.A.

Jan. 25, 1950; application filed in Paris Apr. 5, 1948.  
Application filed in the U.S.A. Apr. 17, 1947 in the  
name of Herbert S. Lecky.

Gr. 15, Cl. 3

The present invention concerns a process for the manufacture of blue gas, characterized by the fact that:

(1) It consists of achieving a combustion cycle and a blue-gas production cycle in separate receptacles; of introducing into the combustion receptacle an oxidant gas, special coal, and coke resulting from the production of blue gas, and the gaseous byproducts resulting from the coking of the coal; and of introducing into the blue-gas generating receptacle water vapor and combustion coke, the heat necessary for the production of blue gas being that contained in combustion coke introduced there.

France 964,798

## IMPROVEMENTS IN GAS GENERATORS

Compagnie des Procédés Gohin-Poulenc, France

Feb. 8, 1950; application filed in Paris Jan. 27, 1942.

Gr. 15, Cl. 3

The present invention concerns improvements made in gas generators operating on wood, charcoal, peat, etc., characterized by the fact that . . .

(1) The air-inlet tuyère is a central tuyère which descends from top to bottom through the mass of fuel and empties at the upper part of the hearth, the body of the tuyère being cooled by water circulation;

(2) A grate is placed under the hearth to support the incandescent fuel, which flows from the hearth through a stricture located at the base of the hearth. The gas produced passes through the grate and flows upward into the annulus formed between a bell over the middle of the grate and the offtake pipe then downward through the gas offtake pipe.



France 973,923

## GAS CONTAINING HYDROGEN

Imperial Chemical Industries, Ltd., Great Britain

Sept. 20, 1950; application filed in Paris Oct. 22, 1948.  
Two applications filed in Great Britain Oct. 22, 1947,  
in the names of William Stannage and Imperial  
Chemical Industries, Ltd.

Gr. 15, Cl. 3

The present invention concerns a process for the production of gas containing hydrogen, by reaction of water vapor on ferruginous material, in an oxidation operation, followed by treatment of this material in a reduction operation, the said process characterized by the fact that:

As a contact mass, a ferruginous material is applied, prepared by coprecipitation, in a finely divided state, of ferric oxide and one or several refractory bodies: aluminum, titanium oxide, and silicate of aluminium.

France 974,198

## DEVICE FOR THE AUTOMATIC REGULATION OF THE TEMPERATURE OF THE GASES OF GAS GENERATORS

Jacques-Henri-Michel Pochebonne, France

Sept. 27, 1950; application filed at Clermont-Ferrand  
on Mar. 12, 1941.

Gr. 15, Cl. 3

The invention concerns a device for the automatic regulation of the temperature of the gases of gas generators, with the aid of a reduction or an increase of the cooling circuit. This automaticity is obtained principally with the aid of automatic shutoffs judiciously placed on a certain number of derivations of the cooling circuit.

France 974,255

## IMPROVEMENTS IN MECHANICAL GAS GENERATORS

West's Gas Improvement Co., Ltd., Great Britain

Sept. 27, 1950; application filed in Paris Oct. 22, 1948.  
Two applications filed in Great Britain Oct. 29, 1947,  
and Sept. 8, 1948, in the names of Frederick Joseph  
West, Ernest West, and the West's Gas Improve-  
ment Co.

Gr. 15 Cl. 3

The invention concerns mechanical gas generators fed by coal or by coke, and the purpose of the invention is to achieve an improved gas generator having a high thermal production, owing to the fact that it makes it possible to reduce to the minimum the losses of heat undergone by the gas circulating between the fuel bed and the evacuation orifice, and making it possible to efficiently achieve the "cracking" of the tar vapors resulting from the combustion, and the fixation of these vapors in the gas generator, which thus prevents the need for a separate installation for purifying susceptible of causing a considerable drop in the thermic production.

It is characterized by a gas-evacuation device from the gas generator which is suspended in the center of the gas generator, below the fuel-admission orifice, the lower part of this device being at the level of the fuel bed and the device being internally lined with refractory material, in such fashion that the gas produced is maintained at a high temperature when it passes outside the gas generator toward the evacuation device, and that all tar vapor rising from the fuel bed is effectively cracked and fixed in the evacuation device itself, the gas generator containing a reserve of fuel above the said device.

732-442-64-7

France 974,557

## IMPROVEMENT IN GAS GENERATORS

Lucien Dumant, France

Oct. 4, 1950; application filed in Lyon Sept. 2, 1941.  
Gr. 15, Cl. 3

The invention concerns improvements made in gas generators for all uses and particularly to those applied to automotive vehicles, these improvements consisting essentially of the asymmetrical constitution of the fire-box carried out by the establishment in the hopper, on the one hand, for the sliding of the fuel, opposite surfaces at different heights, whether these be sloping surfaces or vertical surfaces, the first being also provided with varying slopes and, on the other hand, tuyères arranged also at different heights on the surfaces which bear them, these two means being capable of being considered either alone or in combination.

France 975,073

## IMPROVEMENTS IN THE INSTALLATIONS FOR GAS GENERATORS

Pierre Josset, France

Oct. 11, 1950; application filed in Paris Jan. 22, 1942.  
Gr. 15, Cl. 3

The invention concerns gas generator installations, and more particularly gas generator installations for automotive vehicles operating on wood or charcoal.

The principal object of the invention is:

- (1) The improvement, which consists of surrounding the cooler with stationary or moveable thermal insulation, depending on the surface to which it is adapted, in order to prevent condensations damaging to the filter;
- (2) Various methods of carrying out the said improvement.

France 976,025

## IMPROVEMENTS IN INSTALLATIONS FOR PREPARING GAS IN GAS GENERATORS

Les Gazogènes Imbert, France

Oct. 25, 1950; application filed in Paris Mar. 20, 1942.  
Gr. 15, Cl. 3

The purpose of the invention is a number of improvements in installations for preparing gas in gas generators. The purpose is to burn carbon monoxide produced during the period of preparation as and to the extent that it emerges from the observation pipe.

To this end, the invention consists principally of combining, with installations for preparing gas in gas generators, of means for igniting the carbon monoxide when it emerges from the control pipe and of burning it as and to the extent that it is formed in such fashion as not to introduce in the atmosphere anything but carbon dioxide and other nontoxic gases.

France 976,587

## OVEN FOR THE GASIFICATION OF MEDIOCRE FUELS

Gaston-Victor-Clément Lapessé, France

Nov. 1, 1950; application filed in Paris Apr. 28, 1942.  
Gr. 15, Cl. 3

The invention concerns a vertical oven operating continuously, useable for various chemical reactions provoked by oxygen, especially for the gasification of carbonaceous materials, even very ashly materials, with fusion of the ashes.

The various characteristics of the invention are as follows:

- (1) The oven includes a reaction chamber terminating at the base with a crucible with sloping sides terminating in a hole for continuous flow of the slag and containing above the crucible lateral orifices for feeding oxygen and, if necessary, other gaseous reagents, this chamber being surmounted by a feed column communicating with the atmosphere by means of an air lock.

France 976,616

## IMPROVEMENTS IN GAS GENERATORS

Otho-Gerhard Pierson, Henri Pierson, and André Pointeau,  
France*Nov. 1, 1950; application filed in Paris May 6, 1942.**Gr. 15, Cl. 3.*

The invention concerns a so-called "gas burner" type of gas generator, in which air is introduced under pressure with or without auto-production of vapor.

In the first case, the introduction of the air and the vapor take place either by simple mixture of the two fluids, or by saturation of the air, the latter process making it possible to assure the introduction into the gas generator of a variable quantity, but always rigorously measurable, of vapor in relation to the air; and this by the regulation of the temperature of the air or of the water, or of both.

France 977,468

## IMPROVEMENT IN THE DISTILLATION OF BITUMINOUS SCHISTS

Schistes, Carburants et Lubrifiants, S.A., France

*Nov. 15, 1950; application filed in Paris July 10, 1942.**Gr. 15, Cl. 3.*

The invention concerns:

(1) An improvement in the process for distilling bituminous schists including the adding to these schists of a small proportion of medium mineral oil, and a hot digestion of this mixture before distillation. This improvement consists of dumping the schist in a bath of the oil, which should be added to it, then of extracting it from this bath, in order to send it on for hot digestion and distillation.

France 977,488

## IMPROVEMENTS IN THE CONSTRUCTION OF GAS GENERATORS

Henri Beldent, France

*Nov. 15, 1950; application filed in Paris July 21, 1942.**Gr. 15, Cl. 3.*

The invention concerns:

(1) Improvements in the construction of gas generators consisting of supplying these apparatus already provided with a gas inlet, with an additional gas inlet also ending in an engine, and of supplying these gas intakes with an obturator mechanism which can be independent or common to both, the manoeuvring of which causes one or the other of these intakes to be used only at will in order to induce inside the gas generator a passage of the gases appropriate to the type of fuel used.

France 978,132

## PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GASES WITH HIGH CALORIFIC VALUE

Koppers Co., Inc., U.S.A.

*Nov. 22, 1950; application filed in Paris Dec. 22, 1948.*  
*Two applications filed in Switzerland Dec. 29, 1947.**Gr. 15, Cl. 3.*

The invention concerns:

(1) A process for the production of fuel gases containing carbon monoxide and, if necessary, hydrogen, by transformation of pulverized solid fuels in suspension with oxygen and other gaseous endothermically reactive agents, this process characterized by the fact that:

(a) The pulverized fuel is blown into a reaction chamber which is insulated to prevent losses of heat

and flame in this chamber, a continuous flow of endothermically reactive agents being introduced into the space between the walls of the reaction chamber and the zone of exothermic reaction, in such fashion that the residue fuel, highly heated and coming from the exothermic reaction zone, shall come, before encountering the walls of the reaction chamber, into contact with endothermic reaction agents, being thus cooled, and the ash of the fuel being separated in a pulverized state.

France 978,133

## IMPROVED PROCESS FOR THE GASIFICATION OF SOLID PULVERIZED FUELS

Koppers Co., Inc., U.S.A.

*Nov. 22, 1950; application filed in Paris Dec. 22, 1948.*  
*Application filed in Switzerland Dec. 29, 1947.**Gr. 15, Cl. 3.*

The invention concerns a process for the gasification of pulverized solid fuels in suspension, in oxygen and other gasification agents possibly reacting in an endothermic fashion, the said process being characterized by the fact that:

(a) Independently of the oxygen and other gasification agents, a fuel gas is introduced into the reaction enclosure, in such fashion that the mixture which is formed in the event of interruption of the arrival of solid fuel, and which is composed of fuel gas and oxygen, shall be at a temperature higher than the temperature of ignition of a fuel mixture with an oxygen base.

France 978,134

## PROCESS FOR THE PRODUCTION OF FUEL GASES STARTING WITH PULVERIZED SOLID FUELS

Koppers Co., Inc., U.S.A.

*Nov. 22, 1950; application filed in Paris Dec. 22, 1948.*  
*Application filed in Switzerland Dec. 29, 1947.**Gr. 15, Cl. 3.*

The invention concerns a process for the production of fuel gases by reaction of pulverized solid fuels, in suspension, in oxygen and endothermically reactive gasification agents, the said process being characterized by the fact that:

(a) Over 50% of the weight of fuel is used in the pulverized form of a size less than 0.05 millimeter;

(b) The fuel is crushed before the reaction in such fashion that, when passed through a sieve with a mesh of 0.086 millimeter opening, there is no waste.

France 978,135

## APPARATUS FOR THE CONTINUOUS PRODUCTION OF FUEL GASES

Koppers Co., Inc., U.S.A.

*Nov. 22, 1950; application filed in Paris Dec. 22, 1948.*  
*Application filed in Switzerland Dec. 29, 1947.**Gr. 15, Cl. 3.*

The invention concerns an apparatus for the gasification of a pulverized solid fuel in suspension in oxygen and endothermically reactive gasification agents, the said apparatus into which the fuel is introduced by blowing, by means of oxygen, into a reaction enclosure in which the exothermic reaction is achieved as well as the endothermic reaction, being characterized by the fact that:

(a) The means for introducing endothermically reactive substances into the reaction enclosure are arranged in such fashion as to surround the entry of the mixture of fuel and oxygen so that along the walls

of the reaction enclosure there is formed a continuous layer of the endothermically reactive substance, which envelops the zone of the endothermic reaction.

France 978,136

**PROCESS AND APPARATUS FOR THE GASIFICATION OF SUSPENSIONS OF SOLID PULVERIZED FUELS**

Koppers Co., Inc., U.S.A.

Nov. 22, 1950; application filed in Paris Dec. 22, 1948.  
Application filed in Switzerland Dec. 29, 1947.

Gr. 15, Cl. 3

The invention concerns:

(1) A process for the gasification of pulverized fuels in suspension, in oxygen and gasification agents previously heated by endothermic reaction, the said process being characterized by the following special features:

(a) The heat necessary for heating the gasification agents beforehand by endothermic reaction is produced by the combustion of a fuel with oxygen, whereas the gases of combustion which are formed at the time of this combustion are introduced in the reaction enclosure in which the gasification takes place at the same time that the endothermically reactive gasification agents are introduced.

France 978,137

**APPARATUS FOR THE TRANSFORMATION OF A SOLID PULVERIZED CARBON FUEL INTO FUEL GASES**

Koppers Co., Inc., U.S.A.

Nov. 22, 1950; application filed in Paris Dec. 22, 1948.  
Application filed in Switzerland Dec. 29, 1947.

Gr. 15, Cl. 3

The invention concerns a device applicable to gasification apparatus serving for the production of a gas of value by reaction of pulverized solid fuels in suspension in oxygen or gasification agents of a possibly endothermic reaction, in which the fuel is first of all mixed with oxygen and in which the mixture formed is introduced by blowing through several blowing nozzles into the reaction chamber, this device being further characterized by the fact that:

(a) To each nozzle through which the mixture of fuel and oxygen penetrates into the reaction chamber, there is allocated a special mixing device furnished with means for mechanical introduction of the fuel.

France 978,138

**APPARATUS FOR THE PREPARATION OF A HOMOGENEOUS SUSPENSION OF A PULVERIZED SOLID FUEL IN A GASEOUS AGENT**

Koppers Co., Inc., U.S.A.

Nov. 22, 1950; application filed in Paris Dec. 22, 1948.  
Application filed in Switzerland Dec. 29, 1947.

Gr. 15, Cl. 3

The invention concerns an apparatus for the preparation of a mixture of oxygen and a solid pulverized fuel, the said apparatus in which the combustible substance is introduced in the stream of oxygen by means of an endless conveyor screw being characterized by the following:

(a) The endless screw bears at the end the rotor of a friction device, executed in the manner of a grinding unit, composed of a fixed annular part and of a rotating organ, an annular nozzle for the stream of oxygen being arranged on the periphery of the annular fixed part of the friction device, this nozzle collecting and sweeping along the combustible substance which emerges onto the periphery of the friction device.

France 978,750

**PROCESS AND INSTALLATION FOR THE GASIFICATION OF CARBONACEOUS FINE-GRAIN SUBSTANCES**

Directie van de Staatsmijnen in Limburg, acting for and in the name of the Netherlands Government, Netherlands  
Nov. 29, 1950; application filed in Paris Jan. 7, 1949.  
Application filed in the Netherlands Jan. 8, 1948.

Gr. 15, Cl. 3

The invention concerns a process for the obtaining of mixtures of gas by gasification of carbonaceous, fine-grain substances, characterized by the fact that the material to be gasified is first heated in a special chamber in communication with the gasification reactor, up to approximately the gasification temperature and next, after having been introduced into the gasification reactor, is gasified with the aid of a flow of flue gas, which is introduced into the gasification reactor at a temperature which is higher than the gasification temperature, the said flow of flue gas being obtained by the total or partial combustion of any fuel, preferably a gas, with the aid of oxygen or gas containing oxygen, and to which is added, if necessary, water vapor and/or carbonic acid and/or another gasification agent, such as another flow of flue gas, this flow of flue gas having in the gasification reactor a speed regulated in such fashion that it shall be always lower than the speed for which the largest particles of the substance to be gasified fed to the reactor are specifically maintained in suspension.

France 980,327

**IMPROVEMENTS IN GAS GENERATORS**

Fernand Sepulchre, France

Dec. 27, 1950; application filed in Paris Jan. 8, 1948.  
Gr. 15, Cl. 3

The invention concerns improvements in gas generators making it possible, in particular, to effect beforehand separate carbonization of the fuel—that is, to effect the carbonization with possible predistillation of the fuel, then gasification by combustion of the carbonized and distilled residue, in order to produce, from crude or low rank fuels and with a minimum calorific loss, a producer gas well freed of tars and rich in hydrogen and in hydrocarbons. The apparatus which is the subject of the invention is characterized more particularly by the following points:

(1) The primary air injected into the gas generator is first fed to the carbonization zone, then passes through a system of pipes in to the gasification zone.

France 982,611

**PROCESS AND INSTALLATION FOR THE GASIFICATION OF PULVERIZED CARBONIFEROUS MATERIALS**

Directie van de Staatsmijnen in Limburg acting for and in the name of the Government of the Netherlands

Jan. 31, 1951; application filed in Paris Dec. 29, 1948.  
Two applications filed in the Netherlands Dec. 29, 1947, and May 8, 1948.

Gr. 15, Cl. 3

The invention concerns a process for the preparation of mixtures of gas by gasification of pulverized carboniferous materials in two gas generators placed in series, characterized by the fact that the volume of the reaction space in one of the gas generators known as the large gas generator is a multiple of the volume of reaction space in the other, or small gas generator; and that gasification in the small gas generator takes place according to the principle of transverse flow, at a high temperature and with a high capacity, but with low production; whereas in the large gas generator, gasification takes place with an artificially increased concentration of the particles to be gasified, at an average lower temperature, a lower capacity, and with higher production than in the small gas generator.

France 984,078

## RETORT WITH CONTINUOUS FEEDING FOR THE PRODUCTION OF A GAS WITH A VERY HIGH CALORIFIC VALUE

Société Universelle de Combustion Économique, France  
*Feb. 21, 1951; application filed in Paris Feb. 8, 1949.*  
*Gr. 15, Cl. 3*

The present invention concerns the new industrial product consisting of an apparatus for the production of a fuel gas with very high calorific value, free of nitrogen, and designed to feed a burner. This gas is obtained by decomposition, in an atmosphere of water vapor free from air upon contact with coal or other fuel brought to incandescence by an independent heat source or auxiliary apparatus presenting the following characteristics:

(1) The feeding with fuel, pulverized coal preferably, is automatic; the latter is contained in a feed-hopper and led to the inside of the firebox by a mechanical grate which also assures evacuation of the ashes.

France 986,499

## PROCESS FOR THE MANUFACTURE OF A GAS SIMILAR TO TOWN GAS STARTING WITH AN OIL GAS, AND EQUIPMENT FOR PUTTING THIS PROCESS INTO EFFECT

S. R. L. Heurtey & Co., France  
*Mar. 28, 1951; application filed in Paris Mar. 9, 1949.*  
*Gr. 15, Cl. 3*

The present invention includes, particularly:

(1) A process for the manufacture of a gas which possesses the properties of calorific value and density analogous to those of town gas, a process according to which natural gas or a similar oil gas with a high calorific value is decomposed, in the presence of water vapor to which a certain quantity of air or other reagents can, if necessary, be added, on an appropriately heated catalyzer, this natural gas having undergone heating beforehand, the reaction products being fixed by sudden lowering of the temperature at departure from the catalyzer oven, then subjected to purification before being mixed, in adjustable proportions, with a part of the oil gas which has not undergone treatment.

France 991,076

## PROCESS AND INSTALLATION FOR THE PREPARATION OF CARBURETED WATER GAS

The Gas Machinery Co., U.S.A.  
*June 13, 1951; application filed in Paris July 21, 1949.*  
*Application filed in the U.S.A. July 22, 1948, in the names of Kenneth W. Stookey and Edward F. Kennedy.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for the preparation of carbureted water gas which consists of causing blown air to pass periodically into a fuel bed which is incandescent in order to raise the temperature of the latter and to cause steam to pass through this incandescent fuel bed in order to produce water gas, the said process characterized by the fact that:

(a) Almost all the blown air is made to pass directly into the central portion of the lower part of the fuel bed and from bottom to top through this bed, thus distributing the heat in this fuel bed more or less uniformly; and then a hydrocarbon oil is made to arrive in the upper part of the fuel bed in order to be vaporized and produce carbureted water gas.

France 992,312

## GAS GENERATOR FOR VARIOUS FUELS AND ESPECIALLY FOR MINERAL FUELS

Raphael-Louis Couvez, France  
*July 11, 1951; application filed in Paris June 15, 1944.*  
*Gr. 15, Cl. 3*

The present invention concerns a gas generator making possible, by means of a reduced [size] fire box and without use of refractory linings, the safe use of an initially higher temperature than in regular gas generators, a fact which renders this gas generator especially suited for the use of mineral fuels, characterized by the fact that this result is obtained by means of prolonged contact with air admitted against the hottest wall of the tuyère.

France 993,000

## IMPROVEMENTS IN GAS GENERATORS

Société Lilloise de Matériel de Chemins de Fer "La Lilloise", France  
*July 18, 1951; application filed in Paris Oct. 30, 1944.*  
*Gr. 15, Cl. 3*

The invention concerns a gas generator with a double casing for the heating of the shaft by the fuel gas, characterized by the fact that:

(1) The tuyères which penetrate through the wall of the fire box are connected to the air collector, fixed onto the outer casing, by pipes which are relatively long and which form elbows both vertically and horizontally, in such fashion as to permit expansions, and at the same time assuring substantial heating of the admission air.

France 995,234

## IMPROVEMENTS RELATIVE TO THE CARBURETION OF WATER GAS

Humphreys & Glasgow, Ltd., Great Britain  
*Aug. 14, 1951; application filed in Paris Sept. 13, 1949.*  
*Two applications filed in Great Britain, Sept. 16, 1948, and Aug. 9, 1949.*

*Gr. 15, Cl. 3*

The present invention concerns a method of manufacturing carbureted water gas in which the fuel is preheated by the passage of the gases which are released at the time of such manufacture; the said previous heating taking place before the fuel shall have attained a level in the gas generator at which the heavy oil used for carburetion is injected therein; the passage of gas used for preheating lasts for a period of time including at least a complete oil-injection cycle; this preheating is carried out also thanks to the combustion of the blowing gases which takes place, either upon contact of the fuel, or in the vicinity thereof, during the blowing cycles or during only one of these cycles.

France 995,235

## IMPROVEMENTS RELATING TO THE MANUFACTURE OF CARBURETED WATER GAS AND CARBURENTS USED FOR THAT MANUFACTURE

Humphreys & Glasgow, Ltd., Great Britain  
*Aug. 14, 1951; application filed in Paris Sept. 13, 1949.*  
*Two applications filed in Great Britain Sept. 16, 1948, and Aug. 10, 1949.*

*Gr. 15, Cl. 3*

The invention concerns the following characteristic points:

(1) In the manufacture of carbureted water gas in which noncracked oil and the carbon residues are collected onto or in a layer of refractory material, coke, or a like material or a shallow and discontinuous construction provided in the carburetor, the gas produced

traversing this layer in a certain direction and the steam in another, and, during the blowing period, air passing there in the same direction as the steam; a certain quantity of blowing gas being able to traverse it in the same direction as the gases manufactured, the layer being kept at a high temperature and the oil residues which reach it being cracked; the carbon is deposited there, being combined with steam or is burned with the preheated air owing to the fact of its passage through the portion of the layer which it encounters first.

France 995,236

**IMPROVEMENTS MADE IN THE MANUFACTURE OF CARBURETED WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain

*Aug. 14, 1951; application filed in Paris Sept. 13, 1949. Two applications filed in Great Britain Sept. 16, 1948, and Aug. 10, 1949.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) Equipment for the manufacture of water gas constituted by a gas generator, an empty carburetor, and a superheater, connected in such fashion that the blowing gases pass in rising into the gas generator, in descending into the carburetor, and in rising into the superheater; the gases manufactured follow the same path; this apparatus is characterized by the fact that the carburetor, the lower part of which is empty and the upper part of which communicates with the foregoing part by means of a throttle valve, is provided with a system of oil injection in its lower part, and by the fact that an entry provided in its upper part sweeps along the gases coming from the gas generator in a rotating motion; these gases, therefore, effect this motion in the upper part; they thus pass into the throttle point and into the lower part.

France 995,237

**PROCESS FOR THE CARBURETION OF WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain

*Aug. 14, 1951; application filed Sept. 13, 1949 in Paris. Two applications filed in Great Britain Sept. 16, 1948, and Aug. 10, 1949 in the names of Norman Henry Williams and Humphreys & Glasgow, Ltd.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) The carburetion of water gas by oil in an empty carburetor, the walls of which are heated by the combustion of the blowing gases, which are animated at the time of their passage into the carburetor by a rotating motion; admission of air in order to burn the carbon; this admission taking place in addition to that of the air necessary for the combustion of the blowing gases; [and] taking place at the periphery at a point or a limited number of points located in such fashion that the air does not mix completely with the said gases, but that it mixes preferably with the portion of the gaseous flow which enters into contact with the wall of the carburetor.

France 995,238

**CARBURETOR FOR THE CARBURETION OF WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain

*Aug. 14, 1951; application filed in Paris Sept. 13, 1949. Two patent applications filed in Great Britain Sept. 16, 1948, and Aug. 12, 1949, in the names of Norman Henry Williams and Humphreys & Glasgow, Ltd.*

*Gr. 15, Cl. 3*

The present invention concerns:

An empty carburetor for water gas in which the gases coming from the gas generator penetrate through an entry, or entries, tangential or substantially tangential, and traversing it either in rising or in descend-

ing; the said gases being animated by a rotating motion; a system is provided there to vary this motion of rotation in order that it may be adapted to conditions of periods of blowing and of manufacture pertaining to the water gas cycle.

France 995,239

**SET OF APPARATUS FOR THE CARBURETION OF WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain

*Aug. 14, 1951; application filed in Paris Sept. 13, 1949. Two applications filed in Great Britain Sept. 16, 1948, and Aug. 15, 1949, in the names of Norman Henry Williams and Humphreys & Glasgow, Ltd.*

*Gr. 15, Cl. 3*

The invention concerns a set of apparatus for water gas constituted of an empty carburetor in the carburetion enclosure of which the gases coming from the gas generator enter, by means of a pipe which is substantially vertical, in the wall of which slots are provided, or doors, or openings formed or adapted in such fashion that they impart to the gases a tangential or partially tangential motion; the gases pass through these slots, doors, etc., and penetrate into the axial pipe in such a way that the gaseous flow which traverses it and which passes into the empty carburetion chamber emerges imbued with a rotating motion.

France 995,683

**DEVICE FOR LOW-TEMPERATURE DISTILLATION WITH ATTACHED FIREBOX**

Saarländische Brennstoff-Technik G.m.b.H., The Saar

*Aug. 22, 1951; application filed in Paris July 29, 1949.*

*Gr. 15, Cl. 3*

The invention concerns:

(1) A process for coking coal in a low-temperature distillation device coupled with an industrial furnace or firebox, this process being characterized . . . by the following:

(a) Coal suitable for this type of distillation is subjected to low-temperature distillation in an oven with heating surfaces; the said coal is of the agglomerating type, even containing a great deal of schist, and not washed, in pieces which do not need to be smaller than 15 millimeters; and being subjected to distillation under conditions which supply a coke which is still satisfactory as to mechanical resistance conditions, size of grains, and suitability for combustion imposed by the industrial furnace annexed, the said coke being introduced directly and in a nonextinguished state into the firebox.

France 995,952

**PROCESS FOR PRODUCING COMBUSTION GASES, IN PARTICULAR SYNTHESIS GASES, IN GAS-GENERATOR APPARATUS**

Badische Anilin- & Soda-Fabrik, Germany

*Aug. 22, 1951; application filed Sept. 23, 1949 in Paris. Application filed in Germany Jan. 19, 1949.*

*Gr. 15, Cl. 3*

This invention concerns a process for the fabrication of combustion and synthesis gases in gas generator apparatus, starting with pulverized or granulated fuels, on the one hand, and of fuels in the form of pieces, such as coke, coal, or briquettes, on the other hand, . . . characterized by the fact that:

Either the pulverized or granulated fuel is gasified in a dust gas generator, or the fuel in the form of pieces is gasified in a flow gas generator surmounted, if necessary, with an apparatus for low-temperature carbonization, and the gases emerging from the dust gas generator are made to pass through the flow gas generator, in order that the appreciable quantity of

heat which they sweep along shall be used to cover the heat needs at the time of endothermic gasification in the flow gas generator.

France 996,260

**PROCESS FOR THE PRODUCTION OF FUEL GAS STARTING WITH GRANULAR OR PULVERIZED FUELS**

Badische Anilin- & Soda-Fabrik, Germany

*Aug. 29, 1951; application filed in Paris Sept. 26, 1949. Application filed in Germany Feb. 12, 1949.*

*Gr. 15, Cl. 3*

This invention concerns:

(1) A process for the production of fuel gas starting with granular or pulverized fuels, characterized by the fact that a part of the gasification is effected in an anti-chamber preceding the gasification chamber proper, and that the mixture of solid non-gasified fuel, or fuel gas, and of gasification agent which shall not have reacted, is fed tangentially into a centrifugal gasification chamber, with central evacuation of the gases; and that the said mixture is kept in rotation there, possibly causing gasification agents to arrive there again tangentially, until the solid fuel shall have been virtually entirely gasified.

France 997,616

**PROCESS FOR THE PRODUCTION OF GAS IN TWO OR MORE THAN TWO GAS GENERATORS**

Demag A.G., Germany

*Sept. 12, 1951; application filed in Paris Oct. 14, 1949.*

*Gr. 15, Cl. 3*

The invention covers particularly the following characteristics and their various possible combinations:

(1) Process for the production of gas in two or more than two gas generators operating alternately, characterized by the fact that the fuel beds of the gas generators are, with the objective of obtaining a special arrangement of the said beds, kept in suspension and imbued with a whirling motion by gaseous agents.

France 997,777

**PROCESS FOR THE GASIFICATION OF GRANULIFORM COALS, IN PARTICULAR OF PULVERIZED COAL WHICH GIVE RISE TO THE FORMATION OF TAR, AND HAVING A HIGH ASH CONTENT**

Badische Anilin- & Soda-Fabrik, Germany

*Sept. 12, 1951; application filed in Paris Oct. 21, 1949.*

*Application filed in Germany Oct. 29, 1948.*

*Gr. 15, Cl. 3*

The present invention concerns a process for the gasification of granuliform coal, in particular pulverized coal, forming tar and having a high ash content, the said process consisting of blowing from top to bottom the gasification agents containing oxygen, then of periodically placing in motion the bed of coal by means of gases introduced from bottom to top, in order to permit the dropping and removal of the ash and slag. This process is particularly characterized by the following points:

(1) At the time of blowing from bottom to top, the exothermic reaction gases are introduced first, especially air; then the endothermically reactive gases, especially steam, the fresh coal being introduced after the incandescent fuel bed shall have attained an approximately uniform temperature.

France 999,019

**PROCESS FOR SEPARATING THE VOLATILE ELEMENTS OF COAL**

Alamjit Dhaliwal Singh, U.S.A.

*Sept. 26, 1951; application filed in Paris Nov. 8, 1949.*

*Gr. 15, Cl. 3*

The present invention concerns:

(1) Improvements made in the devolatilization of

coal in the fluid phase, the said improvements being characterized by the following points:

(a) Fluidized coal is subjected to a devolatilization treatment (elimination of the volatile elements which the coal contains), under high pressure which is substantially higher than that of the atmosphere;

(b) The pressure applied for devolatilization is at least 1.28 kilograms per square centimeter (on the pressure gauge);

(c) The gaseous products of the devolatilization are expanded in a gas turbine.

France 999,051

**PROCESS FOR THE GASIFICATION OF PULVERIZED FUELS**

Demag A.G., Germany

*Sept. 26, 1951; application filed in Paris Nov. 9, 1949.*

*Application filed in the Grand Duchy of Luxembourg on Nov. 24, 1948, in the names of Demag A.G. and Wilhelm Flesch.*

*Gr. 15, Cl. 3*

The invention extends particularly to the following characteristics:

(1) Process for the gasification of pulverized fuel in a descending gaseous flow, characterized by the use, during brief intermediate periods, of inert gas in order to induce a grading by deposit in the fuel bed, a grading in which the largest elements constituting the fuel bed, especially the slag which is produced in the upper part of the fuel bed during the descending gasification phase, descend to the lower part and are then extracted from the gas generator in the customary manner.

France 1,023,915

**PROCESS FOR THE MANUFACTURE OF A GASEOUS FUEL**  
Allied Chemical & Dye Corporation, U.S.A.

*Jan. 7, 1953; application filed in Lyon on Aug. 4, 1950.*

*Patent applied for in the U.S.A. on Sept. 2, 1949, in the name of Harry B. Pearson.*

*Gr. 15, Cl. 3*

The present invention relates to the manufacture of gaseous fuels starting with hydrocarbons, and is directed more particularly toward a new and perfected process and equipment which make it possible to transform normally liquid hydrocarbonaceous oils and condensable hydrocarbonaceous gases into a highly combustible homogenous gas the qualities of which render it specially applicable for heating.

France 1,023,986

**OVEN FOR DEGASSING AND GASIFICATION OF FUELS HIGH IN ASH**

C. Otto & Co., G.m.b.H., Germany

*Jan. 7, 1953; application filed in Paris on Aug. 17, 1950.*

*Gr. 15, Cl. 3*

The invention consists of an oven useable for the degassing and the gasification of high ash fuels and provided with continuously operating vertical chambers with a rectangular cross section in which the sweeper fluid crosses the fuel while passing from one major side toward the opposite side, characterized by the fact that the ratio between the height of the fuel swept along by the fluid and the thickness of the bed of fuel is greater than 10:1.

France 1,026,173

**PROCESS FOR THE PREPARATION OF TOWN GAS STARTING WITH GASEOUS OR LIQUID HYDROCARBONS**

Marcel Jean. Société Chimique de la Grande Paroisse (Azote et Produits Chimiques), France

*Feb. 4, 1953; application filed in Paris July 25, 1950.*

*Gr. 15, Cl. 3*

The invention consists of a process for the preparation of town gas starting from gaseous or liquid hydro-

carbons, consisting of associating the incomplete catalytic combustion of a part of the hydrocarbons with an endothermic catalytic treatment, by steam, of the remainder of the hydrocarbons, in such fashion as to finally obtain a gaseous mixture having the appropriate hydrogen content.

France 1,028,730

**DOUBLE COLLECTOR BASIN FOR EXTRACTION OF ASH FROM LARGE INDUSTRIAL GAS GENERATORS**

Pierre Roussey and Paul Roussey, France

*Feb. 25, 1953; application filed in Versailles Dec. 1, 1950.*

*Gr. 15, Cl. 3*

The invention consists of a device in the form of an accessory collector basin making it possible to deposit in a desired place the ash from gas generators which has been extracted in various places.

France 1,029,152

**PROCESS FOR THE PRODUCTION, STARTING WITH LIGNITE IN BRIQUETTES, OF FUEL GAS SUITABLE FOR SYNTHESSES**

Badische Anilin- & Soda-Fabrik, Germany

*Mar. 4, 1953; application filed in Paris on Dec. 6, 1950.*

*Application filed in Germany on Dec. 9, 1949.*

*Gr. 15, Cl. 3*

The present invention consists of a process for the production, starting with lignite in briquettes, of fuel gas suitable for synthesis, characterized particularly by the following points, taken singly or jointly:

(1) The lignite is carbonized and gasified in a runoff gas generator equipped for removal of the liquid slag, provided with a distillation shaft or a zone of slow combustion; and the distillation gases withdrawn from the gas distillation cycle are introduced into the lower part of the runoff gas generator, advantageously provided with a heating device and serving to operate the distillation [process].

France 1,029,308

**COMBINED GAS AND STEAM GENERATOR**

Heinrich Koppers G.m.b.H., Germany

*Mar. 4, 1953; application filed in Paris Dec. 8, 1950.*

*Application filed in Germany on Jan. 4, 1950.*

*Gr. 15, Cl. 3*

The invention relates to a combined gas and steam generator for the treatment of fuels in pieces of any type whatsoever, with a jacketing serving for the production of steam under high pressure, and which is formed by sensibly vertical boiler tubes emptying at their upper and lower curved extremities into collector chambers in a virtually radial direction, in such fashion that chambering is produced at the periphery of the shaft, the said combined generator being particularly characterized by various special features.

France 1,029,608

**IMPROVEMENTS INTRODUCED IN OVENS WITH BATTERIES OF CHAMBERS FOR THE PRODUCTION OF GAS AND COKES**

C. Otto & Co. G.m.b.H., Germany

*Mar. 11, 1953; application filed in Paris Oct. 31, 1950.*

*Gr. 15, Cl. 3*

The invention consists of improvements introduced in ovens with batteries of chambers for the production of gas and cokes, these chambers being separated by walls or sidewalls containing vertical flues.

France 1,030,319

**PROCESS FOR THE PRODUCTION OF TOWN GAS STARTING WITH METHANE OR OTHER GASEOUS HYDROCARBONS**

Badische Anilin- & Soda-Fabrik, Germany

*Mar. 11, 1953; application filed in Paris Dec. 29, 1950.*

*Application filed in Germany Oct. 4, 1950.*

*Gr. 15, Cl. 3*

The present invention consists of a process for the manufacture of town gas starting with methane or other gaseous hydrocarbons by partial conversion with steam in the presence of catalyzers containing nickel, with exterior heating, characterized by the fact that the conversion takes place in chambers or retorts of refractory ceramic material filled with catalyzers, the walls of which are no more than 15 centimeters apart.

France 1,031,837

**PROCESS AND APPARATUS FOR THE GASIFICATION OF PULVERIZED FUELS**

Metallgesellschaft A.G., Germany

*Mar. 25, 1953; application filed in Paris Jan. 12, 1951.*

*Gr. 15, Cl. 3*

Process for the gasification of pulverized fuels swept along by a gasifying fluid through a gas generator, characterized by the fact that the reaction mixture of pulverized fuel and gasifying fluid is made to pass, preferably at temperatures below the calcination temperature of the ash, through beds or other stackings of bodies or elements, shaped or unshaped, or through devices with a similar effect such as, for example, in the form of grates, sieves, checkerwork, etc.

France 1,032,897

**CYCLICAL PROCESS AND APPARATUS FOR GASIFICATION OF FUEL OILS FOR THE PRODUCTION OF TOWN GAS**

Antoine Bolzinger

Gas de France, France

*Apr. 1, 1953; application filed in Paris Feb. 20, 1951.*

*Gr. 15, Cl. 3*

A cyclical process for manufacturing a gas approximately similar to town gas, from fuel oils; this process including a combination of the following three cycles:

A first cycle in which a contact mass is heated at a temperature from 900° to 1,000° C by burning oil in proximity to this mass and a part of the carbon deposited during the third cycle on the same mass;

A second cycle in which steam is injected onto the contact mass and onto the remaining carbon, which have been heated to a temperature of 900° to 1,000° C during the first cycle, in such fashion as to form water gas with the carbon on the said mass, the endothermic reaction thus produced resulting in a cooling which is limited to a temperature of about 800° C;

A third cycle in which oil and steam are injected onto the contact mass, in such manner as to form at a temperature lower than 800° C a cracking gas which, mixed with the water gas produced during the second cycle, yields a gas having properties analogous to those of town gas.

France 1,033,848

**PRODUCTION OF WATER GAS AND ANALOGOUS GAS**

Imperial Chemical Industries, Ltd., Great Britain

*Apr. 8, 1953; application filed in Paris on Mar. 12, 1951.*

*Application filed in Great Britain on Mar. 21, 1950.*

*Gr. 15, Cl. 3*

[This invention concerns a] process of production by separate blowing operations and of production of water gas starting with carbonization of a pulverized material, or of a mixture of an analogous gas containing carbon monoxide, the said process being charac-

terized by the following features, separately or in combinations:

(1) The blowing operation is effected at a speed of the gas chosen in such fashion as to cause suspension of the carbonized pulverized material in a flow which is swept along [with the gases];

(2) The speed of the gas of this operation is equal to at least double or triple the minimum speed necessary for the forming of a flow of the suspended particles;

(3) The operation is effected in a continuous manner.

France 1,034,502

**IMPROVEMENTS INTRODUCED IN PROCEDURES AND DEVICES FOR OBTAINING GASEOUS PRODUCTS BY ENDOTHERMIC REACTIONS**

Rudolph Leonard Hasche, U.S.A.

*Apr. 8, 1953; application filed in Paris, Mar. 28, 1951.*  
*Application filed in the U.S.A. Apr. 5, 1950.*

*Gr. 15, Cl. 3*

The invention consists of improvements introduced in procedures and to regenerating furnaces for obtaining gaseous products by endothermic reactions consisting, insofar as the procedures of the type mentioned are concerned, of: heating a first non-inflammable mixture of an initial material by exothermic combustion and a gas containing free oxygen in order to obtain a nascent endothermic alteration of the initial material, thus forming a second mixture which is inflammable, the endothermic alteration thus set off being propagated by the reaction of exothermic combustion resulting therefrom and which is itself regulated by the limited quantity of oxygen present, the product obtained being next rapidly cooled and the heat recovered by this cooling being used to conduct additional quantities of initial combustible material and of oxygen at the temperature at which the nascent endothermic alteration of the said material is produced.

France 1,035,237

**GASIFICATION OF CARBONACEOUS MATERIALS**

Imperial Chemical Industries, Ltd., Great Britain

*Apr. 15, 1953; application filed in Paris Apr. 9, 1951.*  
*Two patent applications filed in Great Britain on Apr. 24 and Dec. 4, 1950.*

*Gr. 15, Cl. 3*

Process of preheating gases and/or steams admitted to a carburetion and/or gasification operation of a particular solid carbonaceous material maintained in a fluid state, this process being characterized by . . . the passage of the hot gaseous products derived from one of the stages of the operation envisaged as proceeding from bottom to top through a receptacle, in countercurrent in relation to the descending movement—effected through the action of weight—of a mass of solid material in the form of stones through the said receptacle, which has the effect of heating the said stones and of cooling the gaseous products; then, the transfer of the heated stones, by a movement carried out from top toward the bottom through the action of weight and by the intermediation of a communication pipe, to the inside of a second receptacle, in which the stones continue to descend through the action of weight in countercurrent in relation to an ascending current of the gas and/or the steam admitted, which has the effect of cooling the stones and of heating the gas and/or the steam admitted, which are then transferred to any desired stage of the operation envisaged.

France 1,035,753

**PROCESS FOR THE PRODUCTION OF OIL GAS**

The Gas Machinery Co., U.S.A.

*Apr. 22, 1953; application filed in Paris Mar. 8, 1951.*  
*Application filed in the U.S.A. on Mar. 22, 1950, in the name of Kenneth W. Stookey.*

*Gr. 15, Cl. 3*

The present invention consists of a perfected process for the manufacture of oil gas starting from a hydrocarbonaceous oil in an installation including at least a gas-generating zone and a superheating zone in communication with the former, these zones being periodically heated by the passage of hot products of the combustion of air and heating oil in a direct sense, the production of gas including the alternative and periodic passage of the said hydrocarbonaceous oil in the course of an operation of gas formation, in the direct sense, in at least one heated gas-generating zone and the said superheating zone, the said process being characterized by various special features considered singly or in combinations.

France 1,035,759

**PROCESS FOR THE PRODUCTION OF FUEL GAS STARTING WITH LIQUID FUELS**

Heinrich Koppers G.m.b.H., Germany

*Apr. 22, 1953; application filed in Paris on Mar. 13, 1951. Three patent applications filed in Germany on Mar. 15 and Aug. 31, 1950, and on Feb. 27, 1951.*

*Gr. 15, Cl. 3*

The invention relates to a process for the production of high-quality fuel gases, containing hydrogen and carbon monoxide, by transformation of hydrocarbons with the aid of oxygen and steam (reagents) by using a regeneration system through inversion of circulation and including at least two regenerators (accumulators of heat from preheating) for the alternate preheating of the reagents, the said process being characterized by various special features.

France 1,037,697

**IMPROVEMENTS IN GAS GENERATORS**

Maurice Bessieux, France

*May 6, 1953; application filed in Paris May 23, 1951.*  
*Gr. 15, Cl. 3*

The invention consists of improvements in gas generators, characterized by the following features, considered separately or in combination:

(1) A metal pipe with water flowing through it is arranged in the firebox or in the immediate proximity thereof, and the hydrogen produced by the thermal decomposition of the water is introduced into the gaseous mixture feeding the generator.

France 1,038,121

**DISTRIBUTION DEVICE DESIGNED ESPECIALLY FOR PREHEATED COAL, IN LOW-TEMPERATURE DISTILLATION OVENS**

Société de Technique Industrielle, France

*May 6, 1953; application filed June 5, 1951.*

*Gr. 15, Cl. 3*

The hoppers of low-temperature distillation ovens are fed by a scraper-conveyor which keeps them constantly filled, the excess being led off into a vertical bottle, including electrical or other devices for controlling the level of the coal.

France 1,038,122

**OXIDATION SHAFTS FOR COAL DESTINED FOR LOW-TEMPERATURE DISTILLATION**

Société de Technique Industrielle, France

*May 6, 1943; application filed in Paris June 5, 1951.*  
*Gr. 15, Cl. 3*

Device for oxidation of coal destined for low-



temperature distillation and consisting, in principle, of a generally cylindrical shaft, terminating at the lower part in a point in which the coal, previously heated, circulates slowly and regularly in order to become oxidized.

France 1,038,287

**PROCESS AND DEVICE FOR THE GASIFICATION OF FUELS**

Roger Bonneville, France

May 6, 1953; application filed June 8, 1951.

Gr. 15, Cl. 3

Process for the gasification of fuels consisting, in principle, of causing a regulated quantity of superheated steam to act upon the fuel reduced to a pulverized state or to a thin sheet.

France 1,038,810

**PROCESS FOR THE PRODUCTION OF GAS OF VALUE STARTING WITH LIQUID AND GASEOUS FUELS**

Heinrich Koppers G.m.b.H., Germany

May 13, 1953; application filed in Paris June 15, 1951.

Application filed in Germany on June 17, 1950.

Gr. 15, Cl. 3

The invention relates to a process for the production of gas of value starting with liquid fuels by reaction of the latter with oxygen and possibly with steam in a reaction chamber maintained at high temperature, the said process being characterized particularly by the fact that gases are produced by reaction of a part of the liquid fuel with oxygen and by the fact that the other part of the liquid fuel is introduced into these gases prior to cooling.

France 1,041,103

**IMPROVEMENTS INTRODUCED IN METHODS OF GASIFICATION OF PULVERIZED FUELS**

Compagnie Pan-Européenne d'Installations et d'Équipement Industriels, France

May 27, 1953; application filed in Paris Aug. 6, 1951.

Application filed in Germany on Mar. 17, 1951 in the name of Hans Schmalfeldt.

Gr. 15, Cl. 3

The invention consists of improvements introduced in methods of gasification of pulverized fuels. These improvements, used separately or in combination, consist principally of:

First gasifying the pulverized fuel, of collecting in a silo the residual particles resulting from the said first gasification and extracted from the gaseous flow thus produced, of next causing the residual particles amassed in the said silo to be passed again into the gas generator, after arresting the gasification of the pulverized fuels in such fashion that the gasification periods of the pulverized fuel and the partially gasified particles shall alternate constantly, the particles which have been gasified twice being collected into a special ash silo.

France 1,041,773

**PROCESS FOR THE PRODUCTION OF FUEL GASES**

Heinrich Koppers G.m.b.H., Germany

June 3, 1953; application filed in Paris May 9, 1951.

Application filed in Germany on May 23, 1950.

Gr. 15, Cl. 3

The invention relates to a process for the production of gas of value by "gasification in suspension" of pulverized fuels with gaseous agents or in the form of steam reacting exothermically and endothermically in a high-temperature reaction chamber into which the fuel is blown . . . and by the fact that the temperature and velocity of flow of the components of the mixture are established in such a manner that the heat

necessary inside the reaction chamber for the endothermic reaction is produced essentially by the exothermic reaction between the fuel and the oxygen.

France 1,041,779

**PROCESS FOR THE PRODUCTION OF GAS STARTING FROM COMBUSTIBLE MATERIALS AND INSTALLATION FOR EFFECTING THIS PROCESS**

Ludwig Weber, Germany

June 3, 1953; application filed in Paris May 11, 1951.

Application filed in Germany May 11, 1950.

Gr. 15, Cl. 3

The invention consists particularly of the following characteristics, and their various possible combinations:

(1) Process for the production of gas from combustible materials, characterized by the fact that the materials are heated by means of granular heat carriers; the carriers being heated beforehand to a temperature higher than the gasification temperature, then brought into intimate contact with the fuel, this contact varying preferably in a permanent manner, then finally separated from the gasification residues, such separation being based on the use of the various physical properties of the elements to be separated.

France 1,041,780

**PROCESS AND INSTALLATION FOR HEATING FUELS AND ANALOGOUS MATERIALS**

Ludwig Weber, Germany

June 3, 1953; application filed in Paris May 11, 1951.

Application filed in Germany May 11, 1950.

Gr. 15, Cl. 3

The invention consists particularly of a . . . process for the heating of materials, and particularly of fuels, with the aid of granular heat carriers, a process characterized by the fact that the granular heat carrier is conducted to the material to be heated in one or several successive temperature stages, and that at the end of each of these stages there are provisions for separating the carrier from the heated materials.

France 1,041,820

**IMPROVEMENTS IN WATER-GAS APPARATUS FOR CARBURETION BY MEANS OF HEAVY OILS**

Société de Construction d'Appareils pour Gaz à l'Ecu & Gaz Industriels, France

June 3, 1953; application filed in Paris May 21, 1951.

Gr. 15, Cl. 3

Improvements in water-gas apparatus for carburetion by means of heavy oils consisting of a tangential arrival of the gases to the upper portion of the carburetor, an injection into the carburetor of atomized oil in the form of a hollow cone, a notch at the lower portion of the carburetor, and air arriving at intervals on the notch or higher up, to assure combustion of possible deposits of carbon.

France 1,042,285

**SYSTEM AND MIXED PROCESS OF PULVERIZATION AND SEMI-GASIFICATION OF SOLID FUELS**

Gaston-Francois Sautenoy, France

June 3, 1953; application filed in Paris Sept. 19, 1951.

Gr. 15, Cl. 3

The process which is the subject of the present invention consists . . . of pulverizing the fuel by using four methods adapted to each stage of pulverization, and of inducing a beginning of distillation, as well as the

instantaneous, hence violent, disengagement of the gases and the water contained in the fuel particles for the purpose of increasing the oxidation surfaces.

France 1,042,673

**PRODUCTION OF A FLOW OF HOT GAS UNDER PRESSURE**

Imperial Chemical Industries, Ltd., Great Britain

*June 10, 1953; application filed at Paris Dec. 1, 1950. Application filed in Great Britain on Dec. 12, 1949, in the names of Alexander Cantlay Hutchison, David Hardie, and Imperial Chemical Industries, Ltd.*

*Gr. 15, Cl. 3*

The present invention concerns an improved process and an apparatus permitting of engendering on the basis of a monocombustible liquid a flow of hot gas under pressure capable of serving, for example, to activate pneumatically driven mechanisms, such as motors; or for purposes of propulsion by reaction, for example in propellants of the jet type.

France 1,042,710

**APPARATUS FOR OBTAINING INDUSTRIAL GASES STARTING WITH GASEOUS HYDROCARBONS OR LIQUIDS OR FROM SIMILAR MATERIALS**

Compagnie Générale de Construction de Fours and Jean-Henri-François Cassan, France

*June 10, 1953; application filed at Paris Jan. 15, 1951.*

*Gr. 15, Cl. 3*

The invention consists . . . of an apparatus permitting of the realization of any and all reactions the purpose of which is the production of industrial gases (gas for syntheses, hydrogen, town gas, gas for motors, and other applications), starting with liquid or gaseous fuels such as hydrocarbons or analagous compounds; the said reactions being obtained, in or without the presence of chemical or physical catalyzers, by the methods hereinafter enumerated: first, heating of the gasified body beforehand and (or only) of the gasifying fluid (air, oxygen, steam, gases resulting from previous gasification, or a mixture of these fluids); secondly, passage of the homogeneous or nonhomogeneous gaseous or semigaseous phase into an empty enclosure the walls of which are kept at a high temperature; thirdly, passage of the gaseous or semigaseous, homogeneous or nonhomogeneous phase, in the course of reaction, onto solid materials (for example, catalyzers) maintained at an adequate temperature.

France 1,042,968

**PROCESS AND INSTALLATION FOR THE TRANSFORMATION OF LIQUID CARBURETED FUELS AND LIQUIFIABLE FUELS INTO STABLE GASES**

Charles Blaine Francis, U.S.A.

*June 10, 1953; application filed in Paris May 11, 1951. Application filed in the U.S.A. on May 12, 1950.*

*Gr. 15, Cl. 3*

Process for transforming a carbonaceous liquid material such as hydrocarbonaceous oils, tars, and analogous materials into a combustible mixture formed of stable gases by placing the liquid in contact with a heated porous catalyzer of the "X" type defined in the text hereof in the presence of a gaseous oxidation agent, the catalyzer occurring in the form of a column in the midst of the mass to which the liquid is introduced in a fluid state in an intermediate zone of this column through the upper extremity of which the mixture of stable gases escapes.

France 1,044,380

**PROCESS FOR INCREASING THE TOTAL YIELD OF HYDROCARBONS OF C<sub>2</sub> AND HIGHER HYDROCARBONS AT THE TIME OF THE TRANSFORMATION OF SOLID FUELS INTO HYDROCARBONS**

Ruhrchemie A.G. and Lurgi Gesellschaft für Wärmetechnik m.b.H., Germany

*June 17, 1953; application filed in Paris Nov. 2, 1951. Application filed in Germany on Nov. 6, 1950, in the name of Ruhrchemie A. G.*

*Gr. 15, Cl. 3*

The present invention consists of a process for increasing the total yield of hydrocarbons of C<sub>2</sub> and higher at the time of the transformation of solid fuels into hydrocarbons by gasification of the solid fuels and transformation of the carbon-hydrogen oxide mixture formed, a process characterized by . . . the fact that the carbon dioxide formed in this transformation is extracted, by washing, from gases originating from the reaction and remaining after the condensation of condensable products, and is reintroduced, after indirect heating at the gasification temperature, into the gasification apparatus, where it reacts with the incandescent coal.

France 1,044,701

**IMPROVEMENTS BROUGHT ABOUT IN PROCESSES AND DEVICES FOR COKING LIQUID BITUMINOUS MATERIALS AT HIGH TEMPERATURES**

Rütgerswerke A.G., Germany

*June 24, 1953; application filed in Paris May 7, 1951. Application filed in Germany on May 8, 1950.*

*Gr. 15, Cl. 3*

The invention consists of improvements brought about in processes and devices for coking liquid bituminous materials at high temperature, for example, lignite pitch or coal tars, petroleum residues, or other analagous materials, the said improvements . . . consisting, in so far as processes of the type in question are concerned, of freeing the initial materials, which can, if necessary, be preheated, of their volatile constituents at a temperature higher than their melting point, by distillation, oxidation, polymerization, or any other analagous method, until they shall have attained a viscous state, these materials then being brought to a solid state by the effect of higher temperatures.

France 1,045,563

**PROCESS AND INSTALLATION FOR THE PRODUCTION OF GAS**

Gas de France (Service National), France

*July 1, 1953; application filed in Paris Mar. 14, 1949.*

*Gr. 15, Cl. 3*

The invention consists principally of a process for obtaining town gas starting with combustible particles (lignite fines or another solid fuel in pulverized form, or atomized liquid fuel), the said process being characterized by the fact that . . . combustible particles are gasified under pressure and the gases obtained and maintained always substantially at the same pressure are caused to moved in a circuit in the course of which they are progressively cooled in such a manner as to induce, first, reforming reactions, and then methanization reactions.

France 1,045,838

**GAS GENERATOR**

Virgil Stark, U.S.A.

*July 1, 1953; application filed in Paris on June 25, 1951. Application filed in U.S.A. on Oct. 30, 1950.*

*Gr. 15, Cl. 3*

The invention consists of a process for producing heating gas with highly reductive properties, starting with hydrocarbons of high calorific value and from

water, consisting of forming a fluid mixture of hydrocarbon and water, of subjecting this mixture to heat in a series of stages the last of which shall be at least at a temperature of 1,080°, and in which the volume and temperature of the said mixture are brought to the point of cracking of the hydrocarbon and of dissociation of the water, for the purpose of producing permanent gases.

France 1,046,028

**PROCESS FOR THE EXECUTION OF CHEMICAL REACTIONS AT HIGH TEMPERATURES**

Badische Anilin- & Soda-Fabrik, Germany

July 1, 1953; application filed at Paris Nov. 30, 1951.  
Application filed in Germany Dec. 2, 1950.

Gr. 15, Cl. 3

The present invention consists of a process for the execution of chemical reactions at high temperatures in a reductive atmosphere with direct heating by combustion of carbon in the form of coke, of coal, etc., with oxygen, air, or air enriched with oxygen, characterized by the fact that fuel is burned in pieces in the reaction zone in order to transform it into carbon monoxide; and that pulverized coal or fuel gas or oil are burned in order to transform them into carbon dioxide by means of one or several burners mounted above the reaction zone in such fashion that the oxidizing gases of the flame thus formed cannot penetrate into the reaction zone; and by the fact that the materials which are to be caused to react are brought, simultaneously with or separately from the fuel, into the reaction zone.

France 1,046,535

**OVEN WITH CHAMBER FOR THE PRODUCTION OF GAS AND COKE**

Heinrich Koppers G.m.b.H., Germany

July 8, 1953; application filed in Paris Dec. 19, 1951.  
Application filed in Germany on Dec. 27, 1950.

Gr. 15, Cl. 3

The invention relates to an oven with a chamber, particularly to an oven with a horizontal chamber for the production of gas and coke by heating with oil gas and with provision for leading air in limited quantities into the pipes of such gas in order to extinguish the gas and eliminate the graphite, the said oven characterized by the fact that . . . the opening for admitting air into the oil-gas pipe is arranged in a zone of this pipe the temperature of which is above that of the ignition temperature of the air-gas mixture; and that in the oil-gas pipes there are arranged, at the outside end of the said pipes, air-intake pipes which extend into the hot zone of the oil-gas pipe, the annular space which encircles the air-intake pipe serving to admit oil gas; and that the air-intake pipes are connected to a pipe for distributing air under pressure, with the interposition of a mechanism for regulation and possibly for arresting [the air].

France 1,046,825

**IMPROVEMENTS HAVING TO DO WITH THE MANUFACTURE OF CARBURETED WATER GAS**

Humphreys & Glasgow, Ltd., Great Britain

July 15, 1953; application filed in Paris Sept. 5, 1951.  
Two applications filed in Great Britain on Oct. 3, 1950, and Aug. 9, 1951.

Gr. 15, Cl. 3

The invention consists of an apparatus for [manufacturing] carbureted water gas including . . . a superheater traversed by blowing air inverted and introduced in proximity to its gas outlet, a carburetor and a generator at the top of which this air arrives; the secondary air being introduced during blowing of the gas ascension period, in proximity to the top of the fuel bed in order to burn the blowing gases in the upper por-

tion of the generator; and a regenerator in which the heat from the combustion of the gases from inverted blowing is stored, this heat being used to preheat the air destined for the combustion of the gases produced during normal blowing of the fuel bed in the generator; this generator, this carburetor, and this superheater being connected in series, the superheater including an inlet for inverted blowing of air and the generator an outlet for gas from inverted blowing, the aforementioned inlet and outlet being made in such fashion that the air circulates successively in the superheater, in the carburetor, and with the gas from inverted blowing, resulting therefrom, in the generator in a direction inverse to that of the air and gases blown during normal blowing.

France 1,047,599

**PROCESS FOR THE ENRICHMENT OF GENERATOR GAS**  
Société à Responsabilité Limitée Heurtey & Cie., France

July 22, 1953; application filed Jan. 8, 1952.

Gr. 15, Cl. 3

The present invention consists of a process for the enrichment of water gas, according to which a reintroduction is effected into the apparatus for gasification of the oily products which come from the purification of the gas itself, carbureted water gas, or carbureted whole gas.

France 1,047,796

**IMPROVEMENTS BROUGHT ABOUT IN THE PROCESSES AND DEVICES FOR CONVERTING CARBON INTO ELECTRIC ENERGY**

Pittsburgh Consolidation Coal Co., U.S.A.

July 29, 1953; application filed in Paris June 9, 1951.  
Application filed in the U.S.A. on June 17, 1950, in the name of Everett Gorin.

Gr. 15, Cl. 3

The invention consists of a process for converting carbon into electric energy, characterized by the fact . . . that steam and carbon are made to react in a gasification zone under conditions which give rise to the formation of a gaseous product containing CO and H<sub>2</sub>; that this gaseous product and a corresponding gas are made to circulate separately in an electrochemical reaction zone, at a high temperature, in order to oxidize the gaseous product and to convert a portion of its heat from combustion into electric energy; that the temperature in the said electrochemical zone is maintained above the temperature prevailing in the gasification zone; that the heat disengaged in the said electrochemical zone is transferred into the said gasification zone, thus supplying to it the heat for the carbon-steam reaction; and that the electric energy produced is recovered.

France 1,047,990

**IMPROVEMENTS BROUGHT ABOUT IN MEANS FOR GASIFICATION OF PULVERIZED FUELS**

Compagnie Pan-Européenne d'Installations et d'Équipement Industriels, France

July 29, 1953; application filed Aug. 16, 1951, in Paris.  
Application filed in Germany on Oct. 2, 1950, in the name of Hans Schmalfeldt.

Gr. 15, Cl. 3

The invention consists of improvements brought about in means for gasification of pulverized fuels, the said improvements consisting, principally, of gasifying, in a fluid at a high temperature (consisting of a mixture of steam and oxygen or air or air rich in oxygen), pulverized coal already partially distilled, and of introducing, into a portion of the hot gases thus obtained, fresh pulverized coal in order to increase, by the partial distillation of the latter pulverized fuel in the hot gases, the calorific value

of these gases, the pulverized coal thus distilled being next separated from the gases, and subjected to the abovementioned gasification in fluid at a high temperature.

France 1,048,026

PROCESS AND APPARATUS FOR THE MANUFACTURE OF GAS RICH IN HYDROGEN

United Engineers & Constructors, Inc., U.S.A.

July 29, 1953; application filed in Paris Aug. 22, 1951. Application filed in the U.S.A. on Aug. 23, 1950, in the name of John S. Haug.

Gr. 15, Cl. 3

The invention concerns . . . a cyclical process for the manufacture—by the transformation reaction of a hydrocarbon in the gaseous state and of steam—of a gas rich in hydrogen and in products from the oxidation of carbon, principally carbon monoxide—consisting, in one period of the cycle, of burning a fuel in a combustion chamber, of dividing the hot products resulting from the combustion into two streams; of causing these streams to pass simultaneously and parallel with each other following two separate passages, each of which includes a first heat-storage zone of refractory material, a zone enclosing a transformation catalyzer, and a second heat-storage zone of refractory material, to store the heat therein;—and, in another period of the cycle, of causing a hydrocarbon in the gaseous state and steam to pass in series following these two passages, in a direction opposite to the direction of this first-mentioned passage of the hydrocarbon and the steam, thereby forming a gas rich in hydrogen and in products of the oxidation of carbon, principally carbon monoxide; and of collecting this gas.

France 1,048,633

DEVICE FOR HEATING OVENS FOR THE PRODUCTION OF GAS AND COKE

Didier-Werke A.G., Germany

Aug. 5, 1953; application filed in Paris on Oct. 18, 1951. Application filed in Germany on Jan. 18, 1951.

Gr. 15, Cl. 3

Device for heating ovens for the production of gas and coke, including several vertical distillation chambers, heated externally, and a device for distribution located inside the oven of the combustion elements in the various heating walls, characterized by the fact that . . . each heating wall is connected by a communication duct which extends to the outerwall of the oven; is easily accessible there to the outside, and is separated from the same ducts corresponding to the other heating walls, by means of a feed or distribution duct located inside the oven of a combustion element feeding the oven.

France 1,049,463

DEVICE FOR THE GASIFICATION OF PULVERIZED FUELS

Heinrich Koppers G.m.b.H., Germany

Aug. 19, 1953; application filed in Paris Aug. 14, 1951. Two applications for a patent and an additional patent filed in Germany; patent, Aug. 17, 1950, additional patent, May 31, 1951.

Gr. 15, Cl. 3

The invention relates to a device for producing fuel gases of value by gasification of pulverized fuels, in particular of pulverized solid fuels, with oxygen and possibly with steam, the fuel being, during the reaction, in suspension in the gaseous reagent and moving substantially in the same direction as the latter, at the

same time that a vapor formed by a stream of gaseous agent and encircling the primary zone is maintained along the walls of the reaction chamber, characterized by the fact that . . . the reaction chamber is limited on the side of the entry of the reagents by a cooled metallic box which, on the one hand, forms the entry of the combustible oxygen mixture and, on the other hand, forms the entry of the gaseous agent serving to produce the vapor, while the walls of the remainder of the reaction chamber are composed of a refractory ceramic material.

France 1,049,621

PROCESS FOR THE GASIFICATION OF LIQUID FUELS AND EQUIPMENT PERMITTING THE PUTTING OF THIS PROCESS INTO EFFECT

Louis-Marie-Charles Heurtey and Paul-Octave-André Heurtey, France

Aug. 19, 1953; application filed at Paris Jan. 17, 1952.

Gr. 15, Cl. 3

The present invention consists, particularly, of a process for the gasification of liquid fuel, a process in accordance with which the liquid fuel is associated with an inert granular support, this inert granular support being treated in a generator in the manner of a solid fuel; and of methods of putting the said process into effect . . . characterized by the fact that . . . the inert granular body is impregnated with liquid fuel outside the generator.

France 1,049,635

INSTALLATION FOR THE GASIFICATION OF CARBONACEOUS MATERIALS

Imperial Chemical Industries, Ltd., Great Britain

Aug. 19, 1953; application filed at Paris Jan. 18, 1952. Application filed in Great Britain on Jan. 18, 1951.

Gr. 15, Cl. 1

The installation suitable for processes for the production of gas starting with carbonaceous materials, in particles in the fluidized state, the said installation characterized by the fact that . . . it includes a principal chamber, internally divided into smaller chambers, in at least one of which a partial combustion of the carbonaceous material is effected, while in at least one other the carbonaceous material is gasified, these chambers being so arranged that a combustion chamber shall be in contact, at least in part, with a gasification chamber, the installation including devices which cause the hot carbonaceous material in particles to pass into at least one gasification chamber, and from a gasification chamber into a combustion chamber.

France 1,050,448

PROCESS FOR THE PRODUCTION OF GAS AND HEAT STARTING WITH PULVERIZED BITUMINOUS FUELS

Heinrich Koppers G.m.b.H., Germany

Sept. 2, 1953; application filed Nov. 19, 1951, in Paris. Two patent applications and additional patent applied for in Germany: patent, Nov. 20, 1950; additional patent, Jan. 8, 1951.

Gr. 15, Cl. 3

The invention consists of a process for the production of gas and heat starting with pulverized coal or analogous materials, characterized particularly by the following . . . the pulverized coal is treated in movement by means of a stream of oxidizing agents in order to remove the gas from it, and then the degassed residue is separated from the gas produced and is burned so that the heat is released, preferably in a steam generator.

France 1,050,507

## PROCESS FOR TRANSFORMING CARBONACEOUS MATERIALS INTO USEFUL GAS

C.D. Patents, Ltd., Great Britain

Sept. 2, 1953; application filed in Paris Dec. 18, 1951. Two applications filed in Great Britain: the first on Dec. 20, 1950, in the names of C.D. Patents, Ltd., Arpad Artur Josef Kosimierz Eskreiss, and Walter Buse; the second, on Dec. 13, 1951, in the name of C. D. Patents, Ltd.

Gr. 15, Cl. 3

The invention consists of . . . an apparatus for continuous transformation of solid carbonaceous material, either liquid or gaseous, into useful gas, characterized by the fact that the reaction chamber possesses in one zone or in each of several zones arranged along the axis of the chamber, mechanisms for fuel admission equipped with burners fed by the liquid gaseous, or solid carbonaceous material in mixture with air, oxygen enriched air, or of oxygen, at several points around the zone in such manner as to produce flat flames directed toward the interior, in the form of a fan or a fishtail, and characterized by the fact that the chamber includes in one zone or in each of several zones arranged following the axis, several admission means around the zone and fed by steam and/or carbon dioxide, the ones mixing themselves with the others and forming a turbulent mass when they move toward the pipe for the outlet of the gas out of the reaction chamber.

France 1,050,759

## PROCESS AND APPARATUS FOR COKING OF HEAVY HYDROCARBONS IN A FLUIDIZED SYSTEM

Standard Oil Development Co., U.S.A.

Sept. 9, 1953; application filed in Paris Jan. 3, 1952. Application filed in the U.S.A. on May 19, 1951 in the name of James Woodrow Brown.

Gr. 15, Cl. 3

The present invention consists of the treatment of hydrocarbons and, more especially, of an association of coking and catalytic cracking of heavy hydrocarbons in a fluidized system in three stages in which the heat necessary for the coking operation is supplied by an indirect exchange of heat with the freshly regenerated catalyzer.

France 1,050,923

Gutehoffnungshütte Oberhausen A. G., Germany

## PROCESS FOR THE GASIFICATION OF SOLID FUELS IN OFFTAKE GENERATORS

Sept. 9, 1953; application filed in Paris Feb. 18, 1952. Application filed in Germany Feb. 19, 1951.

Gr. 15, Cl. 3

The invention consists of a process for the gasification of solid fuels by means of air or by oxygen or else by air rich in oxygen in offtake gas generators, characterized by the fact that (a) the fuel to be gasified, before attaining reduction temperature, is cooled by atomization of a cooling medium, for example of water, inside the generator up to a certain temperature, in such fashion that the fuel to be gasified is only for very short periods at a temperature below that of the reduction zone; and that (b) the quantity of cooling medium is adjusted according to the carbonic acid content of the gas produced.

France 1,051,417

## IMPROVEMENTS BROUGHT ABOUT IN PROCESSES AND DEVICES FOR EFFECTING ENDOTHERMIC REACTIONS

Rudolph Leonard Hasche, U.S.A.

Sept. 16, 1953; application filed in Paris Nov. 14, 1951. Application filed in the U.S.A. Nov. 14, 1950.

Gr. 15, Cl. 3

The invention consists of improvements brought

about in processes and regenerative devices for obtaining products of a gaseous endothermic reaction, characterized by the fact that . . . initial materials capable of undergoing endothermic reaction, are made to pass inside flues arranged in a first regenerative mass, from their coolest extremity toward their hottest extremity, after the said first regenerative mass has been heated at a temperature such that the endothermic reaction of the said initial materials be triggered in the course of this passage, the said initial materials next traversing a reaction zone in which there is a catalyzer which is hotter, at maximum temperature, than the part of the first regenerative mass, in order that the endothermic reaction of the initial materials be approximately complete and shall furnish a mixture of products; and [by the fact that] the said mixture is cooled by causing it to pass into the flues of a second regenerative mass, from their hottest extremity toward their coolest extremity, the said second mass having been heated beforehand in a manner similar to that adopted for the first regenerative mass.

France 1,051,498

## PROCESS FOR THE PRODUCTION OF GAS STARTING WITH COAL OR AN ANALOGOUS COAL, SUBJECTED TO BURNING, AND GAS GENERATOR FOR THE APPLICATION OF THE SAID PROCESS

Demag A.G., Germany

Sept. 16, 1953; application filed Dec. 18, 1951, by mail. Patent application and additional patent application filed in Germany: Patent Dec. 18, 1950; additional patent, Mar. 19, 1951.

Gr. 15, Cl. 3

The invention consists particularly of . . . a process for the production of gas by the gasification of coal subjected to burning, a process in which mechanical action is brought to bear from above onto the fuel bed, in a permanent or periodic manner, but not by impact, a process characterized by the fact that the fuel bed is subjected to the action of one or several compression tools penetrating in part into the said fuel bed, this action being locally limited and taking place, where the tool or where each of the tools are concerned, on a part of the surface of the fuel bed corresponding to a fraction of the radius of the fire chamber, which action regularizes the gasification and makes it possible to give the fuel bed, without any inconveniences, the height ordinarily adopted when nonagglomerative fuels are used.

France 1,051,761

## PROCESS AND APPARATUS FOR THE CARBONIZATION OF PULVERIZED FUELS AND THE PRODUCTS RESULTING THEREFROM

Charbonnages de France, France

Sept. 23, 1953; application filed in Paris Feb. 22, 1952.

Gr. 15, Cl. 3

The invention concerns . . . a process for the carbonization or semicarbonization of granular fuels, such as pulverized fuels, in vertical ovens, a process essentially characterized by . . . the fact that . . . the distillation gases are made to circulate, in each place in the oven, in the same direction as the movement of the fuel to be distilled; and that . . . the material to be distilled traverses the distillation chamber by dropping freely or by sliding on heating elements arranged inside the said distillation chamber.

France 1,052,823

## IMPROVEMENTS BROUGHT ABOUT IN THE MANUFACTURE OF GASES

The Aerogen Co., Ltd., Great Britain

Sept. 30, 1953; application filed in Paris Jan. 18, 1952.  
 Application filed in Great Britain on Mar. 16, 1951.  
 Gr. 15, Cl. 3

The present invention concerns (1) a fuel gas useable for the replacement of town gas, characterized by the fact that it includes a mixture of producer gas, hydrogen, or another appropriate gas containing hydrogen, with vapors of gasoline; and (2) a process for manufacturing a fuel gas equivalent to town gas, consisting of vaporizing gasoline in a chamber which is kept filled with producer gas, hydrogen, or other appropriate gases containing hydrogen, and then of removing this mixture by methods achieved through a washing of the gas.

France 1,052,910

## PROCESS FOR THE PRODUCTION OF HOT GASES OF LOW CORROSIVENESS

Standard Oil Development Co., U.S.A.

Sept. 30, 1953; application filed in Paris Feb. 20, 1952.  
 Two applications filed in Great Britain on Feb. 26, 1951, and Jan. 25, 1952, in the names of Edwin Mathieson Dodds and Eric Bertram Evans.  
 Gr. 15, Cl. 3

Process for the production of hot gases of low corrosiveness start with fuels containing sulphur or vanadium, or both simultaneously, characterized by . . . the fact that . . . the said fuel is burned inside a combustion zone in the presence of a very small amount of an oxide of an alkaline-earth metal dispersed throughout the entire combustion zone, or of a compound producing an oxide of an alkaline-earth metal, under the conditions prevailing in the said zone of combustion.

France 1,053,937

## PROCESS AND APPARATUS FOR THE MANUFACTURE OF GAS RICH IN HYDROGEN

United Engineers &amp; Constructors, Inc., U.S.A.

Oct. 7, 1953; application filed in Paris Aug. 21, 1951.  
 Application filed in the U.S.A. on Aug. 23, 1950, in the name of Price Wetherill Janeway, Jr.  
 Gr. 15, Cl. 3

The present invention concerns . . . a cyclical process for the manufacture of a gas rich in hydrogen and in products from the oxidation of carbon, principally carbon monoxide, consisting, during one period of the cycle, of burning a fluid fuel and causing the hot products from the combustion to pass in series through a first bed of heat-storage material, a second bed of heat-storage material, and a bed of catalyzer for the endothermic reaction between hydrocarbons and steam, in order to store the heat therein; and, during another period of the cycle, of causing a hydrocarbon in the gaseous state to pass through this second bed of heat-storage material without causing it to pass through the aforementioned first bed of heat-storage material, in mixture with steam, in order to heat the said hydrocarbon; of causing the hot gases to pass through the said bed of catalyzer in order to effect their transformation into a gas rich in hydrogen and in oxidation of carbon products, principally carbon monoxide; and of recovering the said gas.

France 1,054,275

## PROCESS FOR THE PRODUCTION OF PURIFIED GENERATOR GAS WITH HIGH CALORIFIC VALUE AND APPLICATION OF THIS PROCESS TO THE FEEDING OF OVENS SUCH AS MARTIN OVENS

Louis-Marie-Charles Heurtey and Paul-Octave-André Heurtey, France

Oct. 7, 1953; application filed in Paris Dec. 22, 1951.  
 Gr. 15, Cl. 3

The present invention consists, particularly, of . . . a process for the production of purified generator gas with high calorific value, in accordance with which process a gas generator is fed with the aid of bituminous coal maintained in a thick layer above the reaction zone, and the gas produced is removed from the condensable elements, the oily products, and the tars, in a purifying installation before sending it on for utilization, the condensed products freed by the purification installation being returned to the gas generator.

France 1,054,861

## PROCESS AND APPARATUS FOR THE MANUFACTURE OF CARBURETED WATER GAS

United Engineers &amp; Constructors, Inc., U.S.A.

Oct. 14, 1953; application filed in Paris Feb. 6, 1952.  
 Gr. 15, Cl. 3

The present invention concerns . . . a process for the cyclical manufacture of carbureted water gas by air blowing and by the injection of steam, consisting, during one period of the cycle corresponding to the heating, of blowing air onto an ignited bed of solid fuel in order to raise the temperature of the latter and in order to store up heat there—of burning the generator-gas resulting therefrom with secondary air and of storing the heat thereof by causing the hot products of the combustion to pass along a heat-storage passage in contact with a refractory heat-storage material, located in the said passage—and, during a period of the cycle corresponding to the production of the carbureted water gas, of using a part of the heat stored during blowing in the endothermic reaction of the steam with the fuel bed in order to produce blue-flame water gas—and of simultaneously using another part of the heat thus stored for the gasification of a heavy petroleum oil, in the presence of steam and of this blue-flame water gas.

France 1,065,544

## PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GASES STARTING WITH HYDROCARBONACEOUS MATERIALS

Humphreys &amp; Glasgow, Ltd., Great Britain

Jan. 13, 1954; application filed in Paris July 11, 1952.  
 Two applications filed in Great Britain on July 13, 1951, and June 25, 1952, in the names of Humphreys & Glasgow, Ltd., and Norman Henry Williams.  
 Gr. 15, Cl. 3

The invention consists of . . . a process for the production of fuel gases by reaction of a hydrocarbonaceous material in a reaction zone on an oxidizing gas in the presence of an easily oxidized and reduced catalyzer, consisting, characteristically, of drawing off the hot, used catalyzer bearing carbon deposits by means of the reaction zone; of causing this used catalyzer to pass through a regeneration zone at the same time that a stream of gas passes through it, containing molecular oxygen in a quantity which shall not substantially exceed that which is necessary to assure combustion of this carbon deposited on the used catalyzer, the latter, as well as the said gas containing molecular oxygen being sent through the regeneration zone in the same direction and at such speed that the

length of contact between the said used catalyzer and the said gas in the said regeneration zone shall not be substantially higher than the length of time required to assure combustion of the said carbon deposited, and for the restoring into the operating cycle of the catalyzer thus regenerated in the reaction zone.

France 1,065,639

**PROCESS FOR DISTILLING OR REMOVING THE GAS FROM COAL**

Steinkohlen-Elektrizität A.G., Germany

Jan. 13, 1954; application filed in Paris Aug. 14, 1952.

Application filed in Germany on Aug. 16, 1951.

Gr. 15, Cl. 3

The invention consists of a process for distilling or removing the gas from coal, characterized by the fact that distillation or degassing is effected in a system of pipes pertaining to a steam boiler and through which the coal to be treated is pneumatically channeled; . . . and by the fact that the system of pipes serving for distillation or degassing is arranged in a flue in which the flue gases penetrate at temperatures from 1,000° to 800° C.

France 1,065,761

**PRODUCTION OF HYDROGEN GASES STARTING WITH HYDROCARBONS AND STEAM**

Imperial Chemical Industries, Ltd., Great Britain

Jan. 13, 1954. Application filed Oct. 25, 1952. Application filed in Great Britain on Oct. 26, 1951.

Gr. 15, Cl. 3

The invention consists of a process for the production of gas containing hydrogen, . . . characterized by the fact that . . . (1) a mixture of steam and hydrocarbons is brought into contact with a solid pulverized carbonaceous material at a high temperature; (2) the liquid hydrocarbonaceous material is sent directly into the solid pulverized carbonaceous material; (3) the liquid hydrocarbonaceous material is vaporized before being sent into the solid pulverized carbonaceous material; (4) the vaporized hydrocarbonaceous material is sent in the midst of a gaseous vehicle inside the solid pulverized carbonaceous material; (5) the gaseous vehicle is gas already produced in the process; (6) the temperature is maintained between 900 and 1,000° C.; (7) the solid pulverized carbonaceous material descends by gravity through the reaction chamber; (8) the solid pulverized carbonaceous material is maintained in a fluidized state; (9) the solid pulverized carbonaceous material circulates in a system including a reaction stage and a heating stage; (10) the solid pulverized carbonaceous material is maintained in the heating stage in a fluidized state and entrained into the gaseous current; (11) the solid pulverized carbonaceous material is maintained in a fluidized state or entrained by passage in its midst of a gas containing free oxygen, which induces partial combustion thereof while raising the temperature thereof.

France 1,067,394

**MIXTURES OF GASEOUS FUELS**

Samuel Harry White, U.S.A.

Jan. 27, 1954; application filed in Paris Dec. 3, 1952.

Gr. 15, Cl. 3

The invention concerns a gaseous fuel destined to be used with oxygen, in a blowpipe, in a manner similar and with an objective similar to the manner and objective for which acetylene is used in its application to metals, this gaseous fuel being characterized by the fact that it includes a mixture of propane and a small quantity of an oxide and/or ether of petroleum.

France 1,068,267

**LOW-TEMPERATURE DISTILLATION OVEN FOR COAL OR CARBONACEOUS PRODUCTS**

Société de Technique Industrielle, France

Feb. 3, 1954; application filed in Paris Dec. 10, 1952.

Gr. 15, Cl. 1

The invention concerns a distillation oven in which the majority of the calories are supplied by a heating fluid circulating in the same direction as the coal or the carbonaceous products to be distilled, the heating fluid being introduced at the upper portion in order to be put directly in contact with the coal or the carbonaceous products, in such fashion that the temperature of the heating fluid drops immediately and almost instantaneously, thus avoiding any superheating of the coal or of the byproducts.

France 1,068,501

**GAS GENERATOR FOR THE PRODUCTION OF METHANE GAS STARTING WITH FARM MANURE OR OTHER ORGANIC MATERIALS**

Lucien Carlier and Alfred Hardy, Belgium

Feb. 3, 1954; application filed in Paris Dec. 22, 1952.

Application filed in Belgium on Dec. 22, 1951.

Gr. 15, Cl. 3

The present invention consists of . . . a gas generator for the production of methane gas starting with farm manure or other organic materials, characterized by the fact that it is formed of a metal tank arranged in such fashion that its axis shall be horizontal.

This gas generator can also be characterized by the fact that . . . it can be equipped, at one of its extremities, with a moveable or pivoting lid supplied with a manhole.

France 1,068,769

**IMPROVEMENTS BROUGHT ABOUT IN GAS GENERATORS INCORPORATED IN GAS-HEATED OVENS**

C. Otto & Co. G.m.b.H., Germany

Feb. 10, 1954; application filed in Paris Aug. 19, 1952.

Two applications filed in Germany on Sept. 13, 1951, and Apr. 15, 1952.

Gr. 15, Cl. 3

The invention consists of improvements brought about in gas generators incorporated in gas-heated ovens, the chamber (ashpit) for evacuating slag or cinders of which is accessible from outside by orifices arranged in the masonry of the oven, this chamber being separated, in a gas-tight manner, from the gasification retort, the said improvements . . . consisting particularly of the fact that one or several slag-evacuating channels are supplied to the ashpit, the said channels being parallel to the descending walls, with the aid of which a hydraulic joint is formed in relation to the retort, at the same time being parallel to the grate elements which may, if necessary, be housed in the retort above the said ashpit, the base of the said channel or channels proceeding in an upward direction toward the evacuation orifice or orifices for evacuating slag, which is or are arranged above the free surface of the water contained in the ashpit.

France 1,069,002

**MANUFACTURE OF GAS CONTAINING HYDROGEN AND CARBON MONOXIDE**

Imperial Chemical Industries, Ltd., Great Britain

Feb. 10, 1954; application filed in Paris Oct. 15, 1952.

Application filed in Great Britain on Nov. 2, 1951.

Gr. 15, Cl. 3

The invention concerns a process for the manufacture of a synthesis gas containing hydrogen and carbon

monoxide, the said process being characterized by the fact that . . . a solid pulverized carbonaceous material is treated by means of steam, in a production cycle and at a high temperature, and the said solid pulverized carbonaceous material is maintained in a fluidized state; and that the synthesis gas and the solid pulverized carbonaceous material are withdrawn separately from the production cycle, and that this solid pulverized carbonaceous material is charged into a blowing cycle where it is swept along in a stream of gas containing, initially, free oxygen, which burns a part of it and raises the temperature of the remainder; and that the solid pulverized carbonaceous material is separated from the gaseous stream coming from the blowing cycle and is returned, again at a high temperature, into the production cycle.

France 1,069,244

**PROCESS FOR THE PRODUCTION OF FUEL GAS, IN PARTICULAR OF SYNTHESIS GAS, STARTING WITH GASEOUS OR LIQUID FUELS AND FROM SOLID FUELS**

Badische Anilin- & Soda-Fabrik, Germany

*Feb. 10, 1954; application filed in Paris Dec. 29, 1952. Application filed in Germany on Jan. 5, 1952.*

*Gr. 15, Cl. 3*

The present invention concerns a process for the production of fuel gas or, in particular, of synthesis gas, starting from gaseous or liquid fuels, on the one hand, and of solid fuels, such as coke, coal, briquettes, on the other hand, a process characterized particularly by . . . the fact that . . . the gaseous or liquid fuels are transformed with oxygen, or with oxygenated gases, in a flame, in the presence of small quantities of finely divided compounds or compounds in a vapor state, of elements of the first and second groups of the periodic system, or of manganese, or of metals of the iron group or, if necessary, of several of these compounds, in such a manner as to obtain, in addition to carbonic gas and water, principally carbon monoxide and hydrogen; and that the hot gases are directed into a gas runoff generator provided with an outlet orifice for the evacuation of liquid slag, and operating with solid fuels.

France 1,071,137

**PRODUCTION OF WATER GAS AND ANALOGOUS GASES**

Imperial Chemical Industries, Ltd., Great Britain

*Mar. 3, 1954; application filed in Paris, Oct. 15, 1952. Application filed in Great Britain Nov. 5, 1951, in the name of the applicant.*

*Gr. 15, Cl. 3*

The invention consists of a process for the manufacture of a gas containing carbon monoxide, the said process being characterized by the . . . fact that . . . the temperature of a solid pulverized carbonaceous material is raised by reaction with a gas containing free oxygen in a first zone; that the hot solid pulverized carbonaceous material is transferred on the one hand into a second zone where it is placed in reaction with steam in such fashion as to produce a gas containing carbon monoxide; and on the other hand into a carbonization zone where it is mixed with pulverized coal which induces the carbonization thereof, at least in part, the solid pulverized carbonaceous material being removed from the said carbonization zone and returned into the first zone, and the solid pulverized carbonaceous material present in the first zone being swept along and carried by the gas containing free oxygen.

France 1,071,555

**PROCESS AND DEVICE FOR THE MANUFACTURE OF SYNTHESIS GAS**

C. Otto & Co. G.m.b.H., Germany

*Mar. 3, 1954; application filed in Paris Feb. 27, 1953. Two applications filed in Austria in the names of Alois Joklik and Rudolf Keck; patent: Mar. 1, 1952; additional patent: July 18, 1952.*

*Gr. 15, Cl. 3*

The invention consists, particularly, of . . . a process for the manufacture of synthesis gas starting with hydrocarbons, particularly gas containing methane, in accordance with which process, in order to obtain a low residual hydrocarbon content in the reaction product, which implies the use of high primary temperatures, the gases to be transformed are introduced into the reaction zone of the catalyzer bed in such fashion that the chemical processes are only effected on the surface of the catalyzer, and particularly, in such fashion that no chemical reaction can occur before the gases shall have reached the surface of the catalyzer.

France 1,073,105

**PROCESS FOR THE GASIFICATION OF GRANULAR FUELS**

Badische Anilin- & Soda-Fabrik, Germany

*Mar. 17, 1954; application filed in Paris Mar. 19, 1953.*

*Gr. 15, Cl. 3*

The present invention consists of a process for the gasification of granular fuels, in particular pulverized fuels, under ordinary or high pressure, in a shaft-furnace, the fuels to be gasified being advantageously maintained in a bed in turbulent movement by the gasification agents escaping toward the top [of the shaft], a process characterized particularly by the fact . . . that . . . the endothermic gasification agents are introduced at the base of the fuel bed and the exothermic gasification agents are introduced at a certain distance above in the said fuel bed.

France 1,073,523

**PROCESS AND INSTALLATION FOR THE PRODUCTION OF OIL GAS, CONTAINING CARBON MONOXIDE AND HYDROGEN**

Heinrich Koppers G.m.b.H., Germany

*Mar. 24, 1954; application filed in Paris Jan. 13, 1953. Application filed in Germany on Jan 22, 1952, in the name of the applicant.*

*Gr. 15, Cl. 1*

The present invention concerns . . . a process for the production of oil-gases, containing carbon monoxide and hydrogen, and useable particularly for syntheses, by complete gasification of liquid fuels, the fuel being introduced into a reaction chamber in which a high temperature prevails, if necessary, in the presence of steam, and producing in the said chamber a reaction to contact with oxygen or oxygen-enriched air, the said process being characterized by the fact that . . . the liquid fuel is admitted into the reaction chamber separately in relation to the oxygen and in the form of a thin layer (film of liquid); streams of oxygen being directed against each of the two surfaces of the film of liquid, and the said streams of oxygen possessing such an intensity and such an angle of incidence that, in front of the blowing pipe, but at a certain distance therefrom, there is formed a homogenous mixture of finely atomized droplets of liquid and of oxygen, which is transformed by exothermic reaction.



France 1,073,544

## IMPROVEMENTS RELATIVE TO THE CARBURETION OF WATER GAS WITH HEAVY OILS

Humphreys &amp; Glasgow, Ltd., Great Britain

*Mar. 24, 1954 application filed in Paris Jan. 21, 1953.**Two applications filed in Great Britain: the first on Feb. 1, 1952, in the names of Jack Malcolm Hawes and the applicant; the second on Aug. 13, 1952, in the names of Hugh Thurston Cohen and the applicant.**Gr. 15, Cl. 3*

The invention consists of improvements in the carburetion of water gas with heavy oils, in which the carburetor includes, one on top of the other, two or several masses of checkerwork and in which the heavy oil is injected, during the carburetion period, onto the upper surface of the second mass of checkerwork (the first being the upper mass) which retains the deposits of carbon, these deposits then being burned by air, preheated on the first mass and not diluted in the blowing gases.

France 1,073,591

## PROCESS FOR OBTAINING A PRECIOUS FUEL GAS STARTING WITH CAKING BITUMINOUS FUELS

Thyssensche Gas- und Wasserwerke G.m.b.H., Germany

*Mar. 24, 1954; application filed in Paris Jan. 28, 1953.**Six applications filed in Germany in the name of the applicants four patents on Jan. 29, Feb. 23, Feb. 23, and Nov. 5, 1952; two additional patents on Dec. 3, 1952.**Gr. 15, Cl. 3*

The invention concerns a process for the production of valuable gas starting with pulverized caking coal and fine ore, with the obtaining of metals or metal alloys, in which a mixture of coal and fine ore is first coked, forming fuel gas, and the coke formed is next gasified.

France 1,074,822

## PROCESS AND APPARATUS FOR THE GASIFICATION OF PULVERIZED COAL

The Babcock &amp; Wilcox Co., U.S.A.

*Apr. 7, 1954; application filed in Lyon on Feb. 3, 1953.**Gr. 15, Cl. 3*

The invention concerns a process for the continuous production of a synthesis gas by reaction at high temperature of oxygen and steam on a solid fuel containing carbon, characterized by the fact that the said oxygen, the said steam and the said fuel are made to react in accordance with a clearly exothermic reaction at the extremity or in the neighborhood of the extremity of a primary zone which is approximately closed, arranged in a reaction chamber in such a way that the temperature of the components of the reaction shall be raised sufficiently to permit an endothermic reaction of the steam on the products of the said exothermic reaction, and that there shall be determined a clearly endothermic reaction producing the synthesis gas while the components of the reaction traverse a secondary approximately closed zone receiving the said components coming from the considered extremity of the primary zone.

France 1,075,259

## IMPROVEMENTS BROUGHT ABOUT IN METHODS FOR GASIFICATION OF PULVERIZED FUELS

Charbonnages de France, France

*Apr. 14, 1954; application filed in Paris Jan. 8, 1953.**Gr. 15, Cl. 3*

The invention concerns improvements brought about in methods of producing various gases, such as genera-

tor gas, synthesis gas, particularly gas serving for ammonium synthesis starting with coal fines, in which the said fines are gasified in a hot generator gas, with or without the addition of oxygen or steam, characterized by the fact that . . . the solid material swept along by the gaseous torrent at the outlet of the gas generator are separated from the gases by a cyclone or by any other appropriate apparatus, then recycled in order to be mixed with the new particles of coal in the gas generator.

France 1,075,538

## PROCESS OF CARBONIZATION AND DEGASIFICATION OF COAL IN SUSPENSION

Herbert Luckow &amp; Co. Steinkohlen-Elektrizität A. G.,

Germany

*Apr. 14, 1954; application filed in Paris Mar. 7, 1953.**Application filed in Germany on Mar. 8, 1952, in the names of the applicants.**Gr. 15, Cl. 3*

The invention concerns . . . a process of carbonization and degasification of coal in suspension characterized by the fact that, in the critical zone, especially between 350° and 500° C., the speed of heating of the coal is controlled in such a fashion that the quantity of tar separated from the unit quantity of coal within the unit of time shall not be higher, at any time, than that which is separated at the beginning of the said zone.

France 1,076,222

## IMPROVEMENTS IN APPARATUS FOR THE PRODUCTION OF OIL GAS

Société de Construction d'Appareils pour Gaz à l'Eau &amp; Gas Industriels, France

*Apr. 21, 1954; application filed in Paris Feb. 20, 1953.**Gr. 15, Cl. 3*

The invention concerns improvements in apparatus for the production of gas by catalytic cracking and cyclic cracking of liquid hydrocarbons, particularly heavy oils, including separately, or in combination: a vaporization chamber, which can be above the bed of catalyzer or above or below the cracking oven, in relation to the direction of circulation of the heating fumes, the said vaporization chamber being of the "empty" type or of the "checkerwork" type, or of the type with a nest of boiler tubes, or of another type; a bed of refractory material of small dimensions, arranged above or below the catalyzer; an injection of finely atomized oil; the arrival of the various fluids tangentially to the walls of the various chambers; superheating of the steam or of the other reactive gases, either by refractory checkerwork, or by radiation of the walls, or by any other means; superheating of the additional air which may be necessary to make the fumes oxidizing.

France 1,076,369

## PROCESS FOR THE PRODUCTION OF MIXED COAL GAS

Fernand Hellwig, Switzerland

*Apr. 21, 1954; application filed in Lyon Mar. 30, 1953.**Gr. 15, Cl. 3*

The invention concerns a process for the production of mixed coal gas.

This process is essentially characterized by the fact that before steaming is effected, whether this be the first steaming or another effected on the same load, the free spaces which have been formed around the mass of the load from the fact of the contraction of the said mass as a result of coking, are filled by means of coke or coal dust, or a mixture of both.

France 1,076,911

## PROCESS FOR THE PREPARATION OF FUEL GASES

Allied Chemical and Dye Corporation, U.S.A.

*Apr. 28, 1954; application filed in Lyon July 18, 1952. Application filed in the U.S.A. on July 25, 1951, in the name of Joseph G. Voelker.*

Gr. 15, Cl. 3

The invention concerns a process for the production of a fuel gas of low density and high calorific value in a gas-producer installation including a chamber with a refractory jacketing communicating with the first chamber and also presenting a free space for the flowing of the gas; and finally, a fixing chamber containing refractory materials and communicating with the second chamber, this process consisting of heating the said chambers and of producing a gas of low density and high calorific value by simultaneous introduction of gas oil in the free spaces of the two first above-mentioned chambers, and complete vaporization of the said gas oil under the action of the heat radiated while the gas oil is in the free spaces of the two first chambers, the oil vapor obtained passing next onto hot refractory materials in order to produce the fuel gas.

France 1,079,134

## PROCESS FOR THE PREPARATION OF GAS WITH LOW CALORIFIC VALUE, AND GENERATOR USED

Virgil Stark, U.S.A.

*May 19, 1954; application filed in Paris Apr. 7, 1953. Application filed in the U.S.A. on Apr. 8, 1952, in the name of the applicant.*

Gr. 15, Cl. 3

The present invention concerns a process and an apparatus permitting of the combination of two categories of chemical reactions with the objective of effecting the complete catalytic decomposition of hydrocarbons contained in a gas of high calorific value, for the purpose of obtaining by reaction between the said hydrocarbons, air, or oxygen, and steam, a gas of low calorific value and low specific weight containing a high proportion of hydrogen.

France 1,079,145

## IMPROVEMENTS IN APPARATUS FOR THE PRODUCTION OF OIL GAS

Société de Construction d'Appareils pour Gaz à l'Eau &amp; Gaz Industriel, France

*May 19, 1954; application filed in Paris Apr. 9, 1953.*

Gr. 15, Cl. 3

Improvements in apparatus for the production of gas by cracking of hydrocarbons, in particular by cracking of heavy oils, including a heat-accumulation chamber or a heat exchanger or any other device making it possible to regulate the temperature and oxygen content of the fumes of the "heating" phase, in such fashion as to burn the deposits produced during the foregoing "conversion" phase under the best conditions.

France 1,079,446

## PRODUCTION OF OIL GAS ACCORDING TO AN ASH-CIRCULATION PROCESS

Union Rheinische Braunkohlen Kraftstoff A. G., Germany

*May 19, 1954; application filed in Paris June 19, 1953. Application filed in Germany on June 19, 1952, in the name of the applicant.*

Gr. 15, Cl. 3

The present invention consists of a process permitting gasification of fuels in their own fused ashes conducted

in circuit, a separation of the processes of gasification and of reheating being assured by the regulation of the introduction, into the ash circuit, of the fuel and of exothermically and endothermically reactive gasification agents. This process is characterized by the fact that . . . the gases formed in the endothermic gasification chamber are rich in hydrocarbon for the purpose of the production of gas of high calorific value and low in nitrogen—having, for example, the nature of town gas or pipeline gas—or of gas with the highest possible non-saturated hydrocarbon content.

France 1,080,980

## INSTALLATION FOR THE GASIFICATION IN SUSPENSION OF PULVERIZED FUELS

Heinrich Koppers G.m.b.H., Germany

*June 2, 1954; application filed in Paris July 7, 1953. Application filed in Germany on July 25, 1952, in the name of the applicant.*

Gr. 15, Cl. 3

The invention concerns an installation for the production of gas containing carbon monoxide and, if necessary, hydrogen, by reaction of pulverized fuels in suspension with endothermically reacting gasification agents, the said installation being characterized, particularly, by the fact that . . . as an opening serving to evacuate the useful gas produced outside the reaction chamber formed by a refractory checkerwork, there is provided a metal pipe projecting into the said reaction chamber and including a cooling jacket; and that the cooled metal pipe is supported, outside the reaction chamber, independently of the refractory checkerwork.

France 1,080,981

## INSTALLATION FOR THE GASIFICATION OF SOLID FUELS

Heinrich Koppers G.m.b.H., Germany

*June 2, 1954; application filed in Paris July 7, 1953. Application filed in Germany on July 26, 1952, in the name of the applicant.*

Gr. 15, Cl. 3

The invention concerns an installation for the gasification in suspension of pulverized solid fuels with oxygen or air with a high oxygen content, in which a preformed mixture of fuel and oxygen is blown, by a pipe in the form of a nozzle, into a reaction chamber maintained at a high temperature, the said installation being characterized by the fact that an installation for measuring pressure is associated with the pipe for admitting the mixture, which acts on optical or acoustical signals and, if necessary, influences the means for the arresting and regulating of the admission of reactional substances.

France 1,081,018

## PROCESS FOR THE CARBURETION OF INDUSTRIAL GASES WITH HEAVY OILS OR TARS

Combusta G.m.b.H., Austria

*June 2, 1954; application filed in Paris July 8, 1953. Application filed in Austria on July 9, 1952, in the name of the applicant.*

Gr. 15, Cl. 3

The invention concerns . . . a process for the carburetion of industrial gases, such as water gas, generator gas, coke-oven gas, blast-furnace gas, etc., by injection of heavy oils or tars, characterized by the fact that the carburant is injected under pressure higher than 20 atmospheres, and preferably between 100 and 300 atmospheres above atmospheric pressure.

France 1,082,261

DEVICE FOR THE PRODUCTION OF WATER GAS IN OVENS  
FOR THE DISTILLATION OF COAL, WITH HORIZONTAL  
CHAMBERS

Fernand Hellwig, Switzerland

*June 16, 1954; application filed in Lyon Aug. 13, 1953.  
Application filed in Switzerland on Aug. 15, 1952, in  
the name of the applicant.*

*Gr. 15, Cl. 3*

The present invention concerns a moveable and in-

terchangeable device for the rational production of water gas in ovens for the distillation of coal with horizontal chambers.

This device is characterized essentially by the fact that it rests on the base of the chamber and can be withdrawn and changed at any time; and by the fact that it can be adapted as is to existing horizontal chambers, especially to those which are not specially constructed for the purpose of obtaining a high production of water gas.

# GERMAN PATENTS

Germany 286,600

## GENERATOR FOR PRODUCING WATER GAS

Dellwik-Fleischer Wassergas G.m.b.H., Frankfurt am Main, Germany

June 27, 1913; published Aug. 16, 1915.

Gr. 1, Cl. 24e

The invention concerns a generator for the production of water gas, characterized by the fact that midway beneath the charge hole, which is at the same time used as an outlet for the combustion gases, a partition wall which is vertical and which leaves free a channel-shaped space, fed through the round shaft space, while the air and steam inlets and the gas outlets are evenly and similarly distributed over the shaft divisions which are thus created.

Germany 284,702

## GAS GENERATOR WITH INDIRECT GAS HEATING

Aline Bormann née Bæumcher, Charlottenburg, Germany

Nov. 18, 1913; published June 4, 1915.

Gr. 1, Cl. 24e

The invention concerns a gas generator with indirect gas heating, characterized by the fact that the shaft walls of the gasification shaft are composed of fire-clay heating pipes arranged next to each other, and that a fire-clay pipe is built into each heating pipe as a heat conduction pipe in which heat conveyor media, partly steam and partly gas, come in at the top and conduct the collected heat to the fuel in the lower part of the gasification shaft.

Germany 287,252

## GENERATOR FOR THE PRODUCTION OF WATER GAS WITH PARTITION BELOW THE CHARGE OPENING AND FED THROUGH THE SHAFT SPACE

Dellwik-Fleischer Wassergas G.m.b.H., Frankfurt am Main, Germany

Supplement to 286,600. July 26, 1914. Maximum duration: June 26, 1928. Published Sept. 18, 1915.

Gr. 1, Cl. 24e

The invention concerns a generator for the production of water gas with a charge opening likewise serving as an outlet channel for the combustion gases, and beneath the said charge opening a vertical partition as described in Patent 286,600, which is fed through the round shaft space, leaving a channel-shaped space free, characterized by the fact that, in addition to the evenly and similarly distributed air and steam inlets as well as gas outlets, steam nozzles, if desired in conjunction with air nozzles are arranged, within the throat of the shaft.

Germany 287,616

## SHAFT FURNACE FOR THE PRODUCTION OF WATER GAS, WITH A BASKET GRATE AND A SLAG-REMOVAL PIPE CONNECTING WITH THE SAID GRATE FROM BELOW

Dellwik-Fleischer Wassergas G.m.b.H., Frankfurt am Main, Germany

Nov. 10, 1914; published Sept. 30, 1915.

Gr. 1, Cl. 24e

The invention concerns a shaft furnace for the production of water gas, with a basket grate and a slag-

removal pipe connecting with the said grate from below, characterized by the fact that the central slag-removal opening in the floor of the basket grate is connected to the upper edge of a submersible tube set in the conically constituted shaft floor with the help of a grill-type connecting pipe or pipes provided with wide intervening spaces.

Germany 289,590

## PROCESS FOR THE OPERATION OF GAS PRODUCERS WITH LIQUID SLAG RUNOFF, IN ACCORDANCE WITH WHICH A PART OF THE GASES PRODUCED IS FED TO THE BOTTOM OF THE HEARTH, AND EQUIPMENT FOR CARRYING OUT THE SAID PROCESS

Heinrich Koppers, Essen, Germany

July 31, 1913; published Jan. 7, 1916.

Gr. 3, Cl. 24e

The invention concerns:

(1) A process for the operation of gas producers with liquid slag runoff, in accordance with which a part of the gas produced is fed directly to the bottom of the hearth, characterized by the fact that the downward-channeled stream of gas is led off outward through the slag runoff opening, in order to keep the slag liquid by means of direct heating, and thus prevent clogging of the slag runoff opening.

Germany 290,545

## PROCESS FOR THE OPERATION OF WATER GAS PRODUCERS WITH A GASIFICATION RETORT BUILT INTO THE UPPER SHAFT AREA, AND APPARATUS FOR CARRYING OUT THE SAID PROCESS

Hugo Strache, Vienna, Austria

Dec. 9, 1914; published Mar. 3, 1916.

Gr. 1, Cl. 24e

The invention concerns:

(1) A process for the operation of water-gas producers with a gasification retort built into the upper shaft area, which is washed round by warm blowing-gases from outside and, during the gasification period, washed through by water gas, characterized by the fact that the coal distillation gases developed during hot blowing are collected in the degasification chamber by shutting off the gas outlet, and are only driven through the said gas outlet by means of the next-ensuing blasts of steam through the water gas, as a result of which the gas outlet is held open by the next hot blowing until such time as any mixed gas still remaining in the degasification chamber is forced out by the expanding gases.

Germany 291,279

## PROCESS FOR PREVENTING THE FORMATION OF CLINKERS IN GAS GENERATORS

Arthur Graham Glasgow, Richmond, Va., U.S.A.

Aug. 24, 1913; published Apr. 12, 1916.

Gr. 3, Cl. 24e

The invention consists of a process for preventing the formation of clinkers in gas generators, in accordance with which various quantities of air are introduced to the individual layers of fuel, characterized by the fact that by adjustment of the introduction of air in two places in the middle part [of the generator],

the temperature is maintained at a level high enough for the formation of clinkers, whereas the unconsumed remaining fuel in the middle zone is consumed in the end zone by a temperature which is too low to permit the formation of clinkers.

Germany 291,423

**GAS GENERATOR WITH LIQUID SLAG RUNOFF**

Heinrich Koppers, Essen, Germany

*Supplement to 289,590. July 4, 1914. Maximum duration: July 30, 1928. Published in Germany Apr. 17, 1916.*

*Gr. 3, Cl. 24e*

The invention concerns a gas generator with liquid slag runoff in accordance with Patent 289,590, characterized by the fact that the forechamber which receives the slag and the gases flowing along with the slag is constituted in the form of a submersible receptacle in a water container.

Germany 294,333

**GENERATOR FOR THE PRODUCTION OF GENERATOR GAS OR WATER GAS FROM BITUMINOUS FUELS SUCH AS BITUMINOUS COAL, LIGNITE, AND THE LIKE, IN MIXTURE WITH THE COAL DISTILLATION GASES IN ALTERNATING OPERATION**

Eugen Dolensky, Frankfurt am Main, Germany

*July 6, 1915; published on Oct. 3, 1916.*

*Gr. 3, Cl. 24e*

The invention concerns a generator for the production of generator gas or water gas from bituminous fuels, such as bituminous coal, lignite, and the like, in mixture with the coal distillation gases in alternating operation, in accordance with which the hot blowing air is only fed through the fuel column of the shaft, characterized by the fact that the lower area of the shaft, which is filled with the coke column, is divided by a fire bridge which does not reach the dividing layer between the coke column and the fuel column.

Germany 299,874

**GENERATOR WITH LIQUID SLAG REMOVAL AND UTILIZATION OF A PORTION OF THE GASES PRODUCED TO KEEP THE SLAG IN A CONSTANTLY LIQUID CONDITION**

Hugo Rehmann and August Mirbach, Düsseldorf, Germany

*Apr. 28, 1914; published Aug. 14, 1917.*

*Gr. 3, Cl. 24e*

The invention concerns a generator with liquid slag removal and utilization of a portion of the gases produced to keep the slag in a constantly liquid condition, characterized by the fact that the bottom part of the generator is in the form of a funnel which is narrowed in a downward direction, the slag runoff openings being placed at both extremities thereof; and by the fact that slanting burners are arranged over the said openings, which lick the funnel and the runoff opening opposite it with their flames.

Germany 300,452

**PROCESS FOR THE OPERATION OF PRODUCER-GAS SETS COMPOSED OF A FUEL HEATER, A CARBURETOR, AND AN ASH GRATE**

Julius Pintsch A.G., Berlin, Germany

*Feb. 16, 1915; published Sept. 11, 1917.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the operation of producer-gas sets composed of a fuel heater, a carburetor, and an ash grate, in accordance with which the mixture of steam and air first passes through the layer of ashes resting on the ash grate and not yet completely consumed, characterized by the fact that a part of the mixture of air and steam superheated in the layer of ashes flows into the gas reduction zone, while the other part passes through the predrying

zone and, after receiving additional steam, is once more conducted through the ash zone.

Germany 302,827

**PROCESS FOR THE OPERATION OF GAS-PRODUCER SETS WITH PREDRYING OF HIGH MOISTURE FUELS**

August Eckardt, Zwickau, Germany

*Mar. 14, 1914; published Jan. 3, 1918*

*Gr. 3, Cl. 24e*

Process for the operation of gas-producer sets with predrying of high moisture fuels, characterized by the fact that a quantity of the water contained in the fuel, regulated by the cooling effect required in the gasification bed, is vaporized in the predryer by conducting to it heat from a special hearth, and then conducting it to the generator grate together with the heating medium.

Germany 302,840

**PROCESS FOR CONTINUOUS OPERATION OF GENERATORS IN ORDER TO INCREASE THE CALORIFIC VALUE OF THE GAS**

Arthur Riedel, Kössern, Germany

*Dec. 14, 1915; published Sept. 16, 1922.*

*Gr. 3, Cl. 24e*

The invention concerns a process for continuous operation of generators in order to increase the calorific value of the gas, characterized by the introduction of water sprayed in such a finely divided condition that, when a simultaneous corresponding reduction in the carbon dioxide, carbon monoxide, and hydrogen content takes place, the methane content rises to over 5 percent.

Germany 307,134

**PRODUCER-GAS SETS IN WHICH THE FUEL IS TREATED IN SEVERAL CHAMBERS WHICH MAY BE CONNECTED ONE BEHIND THE OTHER IN SERIES**

Otto & Schlosser, Meissen, Germany

*Jan. 20, 1915; published June 26, 1919.*

*Gr. 3, Cl. 24e*

The invention concerns a producer-gas system in which the fuel is treated in several chambers which may be connected in series one behind the other, characterized by the fact that the individual chambers rest on cars and at intervals, when a chamber has consumed its charge, it can be moved forward to the side of the oven, from which placed charging of the oven system takes place.

Germany 314,720

**PROCESS FOR THE PREVENTION OF DEPOSITS OF HARDENED SLAG ON THE WALLS OF GAS-PRODUCER HEARTHS WITH LIQUID-SLAG RUNOFF DEVICE**

Emmanuel Servais, Luxemburg

*Jan. 15, 1913; published Oct. 10, 1919.*

*Gr. 3, Cl. 24e*

The invention concerns:

(1) A process for the prevention of deposits of hardened slag on the walls of gas-producer hearths with liquid-slag runoff [device], characterized by the fact that the slag hearth is heated from outside . . . and that the heated blast is eccentrically blown onto the bath of slag.

Germany 316,412

**GAS PRODUCER WITH DUAL-PURPOSE CHARGING UNIT**

Johannes Schulte, Berlin-Wilmersdorf, Germany

*Jan. 3, 1917; published Nov. 25, 1919.*

*Gr. 4, Cl. 24e*

The invention concerns a gas producer with dual-purpose charging unit, characterized by the fact that the gas removal chambers which surround the charging unit are narrowed by inserts, are filled by means

of spiral conducting surfaces, and connected by separate couplings to the common offtake pipe.

Germany 317,042

**GAS PRODUCER IN WHICH THE ASHES TO BE CARRIED OUT ARE LIQUIFIED BY INJECTION OF A MIXTURE OF GAS AND AIR**

Poetter, G.m.b.H., Düsseldorf, Germany  
July 12, 1917; published in Berlin.  
Gr. 3 Cl. 24e

The invention concerns a gas producer in which the ashes to be carried off are liquified by an injection of a mixture of gas and air, characterized by the fact that injection of the mixture of gas and air takes place through the bottom of the slag hearth.

Germany 317,710

**LOW-TEMPERATURE DISTILLATION RETORT, PARTICULARLY FOR CARBURETORS OR OTHER DEGASSING ARRANGEMENTS**

Carl Linck, Saarbrücken, Germany  
Oct. 25, 1917; published Dec. 23, 1919.  
Gr. 4 Cl. 24e

The invention concerns a low-temperature distillation retort arrangement, especially for the connecting of carburetors or other degassing arrangements, characterized by the fact that the retort is subdivided into several independent chambers, each of which is equipped with its own floor plate and a conveyor device suitable for conveying out the treated charge.

Germany 323,588

**PROCESS FOR THE PRETREATMENT OF SLACKED BROWN COAL FOR GASIFICATION IN A GAS PRODUCER, FOR OBTAINING AMMONIA, TAR, GAS, AND SULPHUR COMPOUNDS**

Deutsche Erdöl A. G., Berlin, Fritz Seidenschur, Charlottenburg, and Curt Koettnitz, Berlin-Lichterfelde, Germany  
Nov. 29, 1916; published July 29, 1920.  
Gr. 3, Cl. 24e

Process for the pretreatment of slacked brown coal for gasification in a gas producer, for obtaining ammonia, tar, gas, and sulphur compounds, characterized by the fact that the moist coal is mixed with sulphates and is formed into pieces.

Germany 327,095

**GAS PRODUCER FOR OBTAINING LOW-TEMPERATURE TAR WITH AN OFFTAKE PIPE FOR THE DISTILLATION GASES WHICH IS FED THROUGH THE MIDDLE OF THE SHAFT IN A DOWNWARD DIRECTION**

Deutscher Industrie-Ofenbau G.m.b.H., Berlin, Germany  
Aug. 31, 1917.  
Gr. 4, Cl. 24e

The invention concerns a gas producer for obtaining low-temperature tar with an offtake pipe for the distillation gases which is fed downward through the middle of the shaft, characterized by the fact that the gas offtake pipe is integrally connected with the rotating grate and bears a perforated hood at the upper end, with slanting iron plates.

Germany 330,573

**GAS PRODUCER WITH SLAG RUNOFF**

Kohle und Erz G.m.b.H., Essen, Germany  
Apr. 5, 1916; published Dec. 17, 1920.  
Gr. 3, Cl. 24e

The invention concerns a gas producer with slag runoff [device], characterized by funnel-shaped slag-collector areas and pocketlike recesses in the generator shaft, at the runoff opening.

Germany 333,676

**WATER-GAS PRODUCER WITH DIRECT UTILIZATION OF THE GASES FOR HEATING**

W. Hagist, Berlin-Friedenau, Germany  
Sept. 10, 1918; published Mar. 2 1921.  
Gr. 1, Cl. 24e

The invention concerns a water-gas producer with direct utilization of the gases produced for heating purposes, characterized by the fact that under the gas-producer shaft an area built as a co-unit with the said shaft and equipped with a checkerwork of firebrick and draft inlet is arranged, into which the gas from the gas-producer shaft is fed, where it is then burned with a mixture of air.

Germany 333,716

**GAS PRODUCER WITH FOREHEARTH FOR PREHEATING OF THE FUEL**

Gebr. Hinselmann, Essen, Germany  
Mar. 14, 1917; published Mar. 3, 1923.  
Gr. 4, Cl. 24e

The invention concerns. . . a gas producer with a forehearth for preheating the fuel, characterized by the fact that the forehearth which, moreover, is completely separated from the gas producer, is adjustably connected at the top and at the bottom with the gas offtake pipe of the gas producer by means of a forked pipe.

Germany 333,789

**APPARATUS FOR DEVOLATIZATION OF BITUMINOUS FUELS BY THE GASIFICATION OR BURNING OF A PORTION OF THE COKE OBTAINED**

A. G. für Brennstoffvergasung, Berlin, Germany  
Oct. 27, 1918.  
Gr. 4, Cl. 24e

Apparatus for the devolatilizing of bituminous fuels by the gasification or burning of a portion of the coke obtained, characterized by the fact that at the lower end of the devolatilizing shaft an adjustable conveyor device, with two-sided operation, is provided, one of the outlets of which is connected with a shaft which serves to gasify or burn one portion of the devolatilized fuel, while the other conveyor opening is connected with the chamber which serves for the extinguishing and offtake of the devolatilized fuel.

Germany 334,716

**OFFTAKE DEVICE BETWEEN THE WASTE-GAS EXHAUST AND THE CARBURETOR OF GAS PRODUCERS**

Karl Linck, Saarbrücken, Germany  
Feb. 3, 1918.  
Gr. 4, Cl. 24e

The invention concerns an offtake device between the waste-gas exhaust device and the carburetor of gas producers, characterized by a ring of segments open at top and bottom, against which a bottom plate with runoff openings and covers over the said openings can be rotated.

Germany 334,872

**GAS PRODUCER IN WHICH THE FUEL IS DISTILLED IN THE UPPER PART OF THE SHAFT BY MEANS OF A HEAT ACCUMULATOR, AND IS THEN GASIFIED IN THE LOWER PART OF THE SHAFT**

Edmund Breitkopf, Kattowitz, Poland  
Jan. 16, 1919; published Mar. 21, 1921.  
Gr. 4, Cl. 24e

The invention concerns a gas producer in which the fuel is distilled in the upper part of the shaft by means of a heat accumulator, and is then gasified in the lower part of the shaft, characterized by the fact that the

heat accumulator is heated independently by conduits from outside, and that the distillation gases are drawn off through openings in the wall of the degasification shaft and through conduits, and that the carburetor gases are drawn off separately from the said distillation gases, out of the carburetor space by means of a pipe.

Germany 337,853

PROCESS FOR THE OPERATION OF GAS PRODUCERS WHICH, IN ADDITION TO A GASIFICATION ZONE AND A LOW-TEMPERATURE CARBONIZATION ZONE, ARE ALSO EQUIPPED WITH AN INTERMEDIATE ZONE FOR RECOVERING NITROGEN

A.G. für Brennstoffvergasung, Berlin, Germany

June 21, 1918; published June 9, 1921.

Gr. 4, Cl. 24e

The invention concerns a process for the operation of gas producers which, in addition to a gasification zone and a low-temperature carbonization zone, are also equipped with an intermediate zone for obtaining nitrogen, characterized by the fact that the low-temperature carbonization zone and the intermediate zone are heated by the means of a stream of clean gas which is conducted through the fuel column, and to which steam is added in the intermediate zone.

Germany 338,192

PROCESS AND APPARATUS FOR CARBONIZATION IN ONE OR SEVERAL RETORTS PROJECTING DOWNWARD IN A GAS PRODUCER

A.G. für Brennstoffvergasung, Berlin, Germany

Dec. 23, 1916; published June 14, 1921.

Gr. 4, Cl. 24e

The invention concerns a process for carbonization in one or several retorts projecting downwards in a gas producer, characterized by the fact that, in order to achieve uniform heating of the retorts, the latter are placed in circular motion during gasification.

Germany 338,370

GAS-PRODUCER SHAFT WITH WATER-COOLED HOLLOW JACKETING SURFACE FOR THE PRODUCTION OF PRODUCER GAS, WATER GAS, AND MIXED GAS

Heinrich Werner, Frankfurt am Main, Germany

Sept. 19, 1919.

Gr. 3, Cl. 24e

The invention concerns a gas-producer shaft with water-cooled hollow jacketing surface for the production of producer gas, water gas, and mixed gas, characterized by the fact that it is constructed of ring-shaped or columnar members which are hollow and interconnecting, and which create a common water chamber.

Germany 340,409

GAS PRODUCER WITH RING-SHAPED DISTILLATION CHAMBERS SUSPENDED INSIDE THE GAS PRODUCER

Walter Steinmann, Erkner bei Berlin, Germany

Apr. 17, 1918; published Sept. 9, 1921.

Gr. 4, Cl. 24e

The invention concerns a gas producer with ring-shaped distillation chambers suspended inside [the gas producer], characterized by the fact that the distillation gases are discharged from the chambers by means of a nest of pipes housed in built-in bells through which the clean gases being drawn off flow, and which nest of pipes empties at various heights of the distillation chamber.

Germany 340,625

PROCESS FOR OBTAINING BYPRODUCTS IN THE PRODUCTION OF MIXED GAS THROUGH ALTERNATING ACTION OF OXYGEN AND STEAM ON FUELS OF ALL TYPES

Friedrich Sommer, Crefeld-Bockum, and Louise Simmersbach née Sudermann and her children Margarita, Hugo, Otto, Edmund, and Ingeborg, Charlottenbrunn, Germany

Oct. 8, 1915; published Sept. 16, 1921.

Gr. 3, Cl. 24e

The invention concerns a process for obtaining by-products in the production of mixed gas through alternating action of oxygen and steam on fuels of all types, characterized by the fact that one or more pairs of reaction zones are built up in the fuel, and that oxygen or a gas or gas mixture containing oxygen is made to act on these zones alternately with steam in such fashion that, in turn, one of the two zones of each pair is treated with oxygen or a gas mixture containing oxygen, and simultaneously, the other zone is treated with steam.

Germany 340,664

GAS PRODUCER HAVING A LARGE AREA AND LENGTHWISE EXTENDED BASE WITH DISTILLATION INSERTIONS

Bunzlauer Werke Lengensdorf & Co., Bolestawiec, Poland

July 17, 1917; published Sept. 15, 1921.

Gr. 4, Cl. 24e

The invention concerns a gas producer having a large area and lengthwise extended base, with distillation insertions, characterized by the fact that the distillation insertions are separated from each other by means of intervening chambers so that the clean gases may be intermittently and adjustably withdrawn, and also by the fact that the distillation gases, for local regulating of the operation, can be intermittently exhausted from the individual distillation insertions.

Germany 341,351

SLAGGING GAS PRODUCER WITH CROSS FLOW OF AIR AND GAS THROUGH THE SHAFT

Heinrich Koppers, Essen, Germany

Dec. 5, 1916; published Sept. 30, 1921.

Gr. 3, Cl. 24e

The invention concerns a slagging gas producer with cross-flow of air and gas through the shaft, characterized by the fact that a shaft is connected to the gas producer shaft, the fuel charge of which is penetrated by an upwards flow of gases coming from the gas producer shaft.

Germany 341,394

GRATELESS GAS PRODUCER

Hermann Goetz, Berlin-Schöneberg, Germany

June 19, 1920.

The invention concerns a grateless gas producer, characterized by wall projections inside the gasification space, under which the blowing air and the injected steam are conducted to the fuelbed.

Germany 343,048

GAS PRODUCER WITH PREDRYING BY MEANS OF SUPERHEATED STEAM

A.g. für Brennstoffvergasung, Berlin, Germany

May 11, 1917.

Gr. 3, Cl. 24e

The invention concerns a gas producer with predrying of the charge with superheated steam and transfer of the evaporated moisture of the fuel into the gasification zone, characterized by the fact that the drying chamber, the drying steam line, the superheated and the line for admitting the superheated drying steam oil connected to ring-shaped main which in turn is con-

nected to the gasification zone and a point of consumption.

Germany 343,814

**PROCESS AND APPARATUS FOR THE SEPARATE OBTAINING OF DISTILLATION GAS AND GENERATOR GAS**

Georg Mars, Csepel bei Budapest, Hungary

*Apr. 4, 1918; published Nov. 10, 1921.*

*Gr. 4, Cl. 24e*

The invention concerns a process for operating a gas producer in accordance with which the combustion gases containing carbon dioxide are passed into a closed-off chamber, covered by the distillation chamber, characterized by the fact that the gases pass out of this chamber through a sloping grate covered with the devolatilized coal.

Germany 343,815

**GAS PRODUCER WITH INTERIOR PRODUCER-GAS RECEIVER**

Walter Steinmann, Erkner bei Berlin, Germany

*Jan. 8, 1919.*

*Gr. 4, Cl. 24e*

The invention concerns a gas producer, characterized by external ducts and interior ducts, with a collector hood which conducts the hot gases from the fuel bed into the drying area and through a collector type with connecting pipes for suction of the distillation gases arising in the intermediate space.

Germany 344,855

**GAS PRODUCER WITH RECTANGULAR SHAFT CROSS SECTION**

A. G. für Brennstoffvergasung, Berlin, Germany

*Nov. 30, 1917.*

*Gr. 4, Cl. 24e*

The invention concerns a gas producer with a rectangular cross section and carbonization by means of interior heating, characterized by the fact that the gasification area is subdivided by means of two parallel partition walls running the length of the shaft into two pocket-shaped gasification chambers, which are placed opposite each other on the lengthwise walls of the shaft.

Germany 345,817

**APPARATUS FOR DEGASING AND GASIFICATION OF BITUMINOUS FUELS**

A. G. für Brennstoffvergasung, Berlin

*Oct. 27, 1918; published Dec. 20, 1921*

*Gr. 3, Cl. 24e*

The invention concerns an apparatus for the devolatilization and gasification of bituminous fuels, in accordance with which the devolatilized fuel is incorporated into the carburetor in the direction of the edge of the latter, characterized by at least two gas exhaust devices brought sidewise of the carburetor shaft, at the lower shaft end of which a removal device is provided over each of the sidewalls of the carburetor sidewalls, and projecting out therefrom.

Germany 347,917

**GAS PRODUCER WITH MANY-CHAMBERED CHARGING HOPPER**

Hugo Rehmann, Düsseldorf, Germany

*Mar. 20, 1919*

*Gr. 4, Cl. 24e*

The invention concerns a gas producer with many-chambered charging hopper, characterized by the fact that the stationary filling vessel of the hopper is divided into two or more parts by means of partition walls which correspond to the position of the individ-

ual chamber parts of the charging hopper and on the one hand make it possible for each individual hopper-chamber section to be independent from the others, on the other hand, however, make it possible to fill all the hopper-chamber parts jointly.

Germany 348,090

**PROCESS AND APPARATUS FOR THE COMPLETE CARBONIZATION OF COAL**

Hugo Strache, Vienna, Austria

*June 28, 1917*

*Gr. 1, Cl. 24e*

The invention concerns a process for the carbonization of bituminous fuels in gas producers with alternating operation and with a devolatilizing retort which can be heated from outside, characterized by the fact that during the gas period, at the transition place from the degassing chamber to the carburetion shaft, steam is blown in which, by utilization of the hot waste gases from the hot blowing is superheated to a regulatable degree.

Germany 350,443

**PROCESS FOR THE PRODUCTION OF A HEAVY GAS SIMILAR TO WATER GAS WITH OBTAINING OF THE TARRY BYPRODUCTS IN ALTERNATING OPERATION**

Dellwik-Fleischer Wassergas G.m.b.H., Frankfurt am Main, Germany

*Feb. 14, 1920.*

*Gr. 4, Cl. 24e*

The invention concerns a gas producer for the production of a heavy gas similar to water gas with obtaining of the tarry byproducts in altering operation with a central gas offtake pipe opening into the core of the devolatilized fuel, characterized by the fact that the water gas which receives the byproducts is led off through an upper side offtake pipe, whereas the hot blowing gases are led off through the central offtake pipe.

Germany 353,649

**PROCESS FOR THE PRODUCTION OF A MIXED GAS COMPOSED OF WATER GAS AND DISTILLATION GASES IN ALTERNATING OPERATION**

Hugo Strache, Vienna, Austria

*Feb. 9, 1921; published May 22, 1922.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of a mixed gas composed of water gas and distillation gases in alternating operation, characterized by the fact that the gases arising from hot blowing are carried off by pipes which extend into the interior of the gas producer and which are empty and open at the bottom, whereas the hot water gas formed during gasification is passed through the annular space filled with crude fuel located outside these pipes.

Germany 357,520

**PROCESS FOR THE OPERATION OF HEAVY-GAS GENERATORS WITH TWO GASIFICATION SHAFTS**

Dellwik-Fleischer Wassergas G.m.b.H., Frankfurt am Main, Germany

*Oct. 12, 1920.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the operation of heavy-gas generators, in which the water-gas-producing steam is passed through at least two gasification shafts blown on by hot air, which are separated from each other and connected in series one behind the other, characterized by the fact that combustion air is added to the water gas produced, and this addition takes place before it enters the second gas producer.



Germany 358,235  
PROCESS FOR THE OPERATION OF GAS PRODUCERS  
WITH BITUMINOUS FUELS

Rütgerswerke A. G., Berlin, Germany

Sept. 7, 1919.

Gr. 3, Cl. 24e

The invention consists of a process for the operation of gas-producers with bituminous fuels, in accordance with which the fuel is dried in a special container in the gas producer by means of a heating medium introduced there, and the waste gases of the drying process are fed under the grate of the gas producer, characterized by the fact that the heating gas is introduced through a connecting pipe in the upper part of the drying chamber and is passed downward along with the stream of fuel, and from there is passed through a pipe into the gas producer.

Germany 358,311  
GAS PRODUCER WITH DRYING CHAMBER, DISTILLATION  
CHAMBER, AND CARBURETOR

Gasgenerator und Braunkohlenverwertung G.m.b.H., Leipzig,  
Germany

Aug. 22, 1920

Gr. 3, Cl. 24e

The invention concerns a gas producer with drying chamber, distillation chamber, and carburetor, characterized by the fact that the distillation chamber has a conical, graduated grate and a conical double cover, and is placed over the carburetor, out of which the gases are led through the grate chamber or firebox, through the grate, through the distillation chamber and through its hollow, conical space, and through the drying chamber to the offtake device.

Germany 360,897  
DISTILLATION-GAS PRODUCER  
Fritz Quade, Berlin-Zehlendorf, Germany

July 7, 1918.

Gr. 3, Cl. 24e

The invention consists of a distillation-gas producer characterized by the fact that the narrowed distillation shaft is composed of several annular-shaped parts superimposed on each other, with gas outlet ducts leading off at the side.

Germany 363,936  
APPARATUS FOR THE PRODUCTION OF WATER GAS

Franz Lang, Frankenthal, Germany

Oct. 27, 1916.

Gr. 1, Cl. 24e

The invention concerns an apparatus for the production of water gas characterized by the fact that the coking shaft is, on the one hand, limited by two walls located opposite each other and permeable by gas, the said walls having connected distribution chambers, through which the air or the steam is passed crosswise in the lengthwise direction of the shaft; and on the other hand, extended at the bottom by means of an open hood with a water closure, through which the ashes and slag are removed from the shaft in a lengthwise direction.

Germany 364,348  
REINFORCED CONCRETE GAS GENERATOR

Otto Roberto Verity, Florence, Italy

Nov. 17, 1920.

Gr. 3, Cl. 24e

The subject of the invention is a reinforced concrete gas generator, characterized by the fact that a reinforced concrete jacketing is freely suspended on supports and with its lower edge supports a fireproof

inner jacketing; and by the fact that the space between the two jacketings is filled with heat-protective material.

Germany 366,469  
GAS PRODUCER WITH CHARGING FROM BELOW

Hermann Goetz, Berlin, Germany

June 23, 1921.

Gr. 3, Cl. 24e

The invention concerns a gas producer with charging from below and with a carburetor which opens out at the top in the manner of a funnel, characterized by the fact that the combustion air is fed from above through the layer of ashes, and the gas is passed off through openings in the narrow part of the funnel.

Germany 368,962  
PROCESS FOR THE PRODUCTION OF WATER GAS OR  
SEMIWATER GAS FROM DEVOLATILIZED FUEL CON-  
TAINING HYDROCARBONS

Peter von der Forst, Essen, Germany

Aug. 20, 1921.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas or semiwater gas from devolatilized hydrocarbonaceous fuels, characterized by the fact that the gas is produced in a blast furnace at a temperature below 850°, and is then passed through incandescent coke at a temperature above 900°.

Germany 369,315  
PROCESS AND DEVICE FOR OBTAINING WATER GAS  
ALONG WITH EXTINGUISHING OF THE COKE

Otto Rosenthal, Nürnberg, Germany

Aug. 4, 1914.

Gr. 1, Cl. 24e

The invention concerns a process for obtaining water gas along with extinguishing of coke, characterized by the fact that extinguishing takes place in several (at least two) closed containers, in one of which a very high temperature (1,000° to 1,200° C.), favorable to the forming of water gas, prevails, while the temperatures in the remaining containers are lower, and the said extinguishing process takes place in a graduated fashion so that the gas mixture which develops in each cooler container is passed through the next hottest container and finally, from the hottest container, the mixture is passed into the gas collector chamber.

Germany 369,316  
PROCESS AND APPARATUS FOR DEGASIFICATION AND  
GASIFICATION OF FUELS IN ROTATING OVENS

Otto Dormann, Stettin, Germany

Dec. 14, 1919; published Feb. 17, 1923.

Gr. 3, Cl. 24e

The invention concerns a process for degasification and gasification of fuels in rotating ovens, characterized by the fact that the combustion air is driven through channels in the rotating oven wall and through the piled-up fuel, and by the fact that the hot clear gases are sucked to the offtake pipe through the central pipe of a distillation ring drum which is divided into compartments through longitudinal walls.

Germany 371,745  
LARGE GAS PRODUCERS FOR THE GASIFICATION OF  
LIGNITE, PEAT, AND SIMILAR FUELS

Friedrich Siemens, Berlin, Germany

July 19, 1919; published Mar. 17, 1923.

Gr. 3, Cl. 24e

The invention concerns large gas producers for the gasification of lignite, peat, and similar fuels, charac-

terized by the fact that inside the annular-shaped grate a conical vessel is centrally arranged which is firmly connected and united with the said grate, and which bears the entire charge, and extends through the entire upper part of the gas producer.

Germany 372,073

WATER-GAS GENERATOR

A. G. für Restlose Vergasung, Frankfurt am Main, Germany

July 22, 1921.

Gr. 1, Cl. 24e

The invention concerns a water-gas producer, in which the water vapor required for the gasification operation is fed into the shaft by occasional spraying of water, characterized by the fact that in the shaft, inside the fuel column, a cover plate is provided under which the water inlet conduit empties into the fuel-free space formed at that very point.

Germany 373,927

GAS PRODUCER WITH ANNULAR-SHAPED SHAFT

August Holzhausen, Graben, Germany

Dec. 3, 1921.

Gr. 3, Cl. 24e

The invention concerns a gas producer with an annular-shaped shaft, characterized by the fact that the gasification space is subdivided by intervening walls, so that different types of gases can be simultaneously produced and can be taken off separately.

Germany 374,504

PROCESS FOR INFLUENCING STEAM CLEARING SIGNALS IN WATER-GAS PRODUCERS

Victor Otto Keller, Vienna, Austria

July 7, 1920; published Apr. 24, 1923.

Gr. 1, Cl. 24e

The invention concerns a process for implementing steam clearing signals in water-gas producers, in accordance with which, under the same pressure and the same temperature, a stream of secondary gas branches off from the stream of main gas and is led back to the main gas stream, characterized by the fact that the secondary stream is sent through a cooler and then activates the steam clearing signal, whereby the main gas stream, before the secondary gas stream is returned to it, is throttled in accord with the resistance coming in in the secondary gas stream.

Germany 375,386

PROCESS FOR THE PRODUCTION OF WATER GAS IN CHAMBERS WHICH ARE INTERCONNECTED BY MEANS OF CONDUITS

Gustav Spier, Engers am Rhine, Germany

Jan. 13, 1921.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas in chambers which are interconnected by means of pipes characterized by the fact that the hot blowing gases formed in the one chamber by the introduction of air, are burned on their way through the pipe into the second chamber with additional air, and are passed through the fuel column into this chamber which, during the preceding production of water gas serves to heat the freshly introduced steam, while the completion of the forming of the water gas takes place through bringing in of the steam and gas mixture into the chamber previously blown with hot air.

Germany 378,389

GAS PRODUCER WITH PREDRYER

Louis Gumz, Niederdollendorf am Rhine, Germany

Oct. 31, 1919.

Gr. 3, Cl. 24e

The invention concerns a gas producer with a pre-dryer for the fuel, characterized by the fact that over the gas offtake of the gas producer, a drying chamber is separated by a wall, from which drying chamber the waste gases are passed through an opening over a cooler and are then passed back over a water-catching device through a pipe into the drying chamber.

Germany 382,611

APPARATUS IN GAS PRODUCERS FOR ALTERNATING OPERATION WITH A DEGASIFICATION CHAMBER FOR LOW-TEMPERATURE DISTILLATION, THE SAID CHAMBER BEING FLOWED THROUGH BY WATER GAS

Hugo Strache, Vienna, Austria

Feb. 25, 1920; published Oct. 4, 1923.

Gr. 1, Cl. 24e

The invention concerns an apparatus in gas producers for alternating operation, with a degasification chamber for low-temperature distillation, the said chamber being flowed through by water gas, characterized by a core built into the interior of the gasification space under the distillation chamber.

Germany 382,612

GAS PRODUCER

Albert Hiorth, Asker bei Kristiania, Norway

June 23, 1920.

Gr. 1, Cl. 24e

The invention concerns a gas producer characterized by the fact that next to the fuel hopper other hoppers for other materials to be burned are provided, the said other materials being flowed through by the producer gases, passed off by pipes, and carried out through side outlets, which are located at a higher point than the hottest section of the gas producer.

Germany 386,484

GAS PRODUCER WITH PREDRYING DEVICE

Berlin-Burger Eisenwerk A. G., Berlin, Germany

July 3, 1921; published Dec. 20, 1923.

Gr. 3, Cl. 24e

The invention concerns a gas producer with a pre-drying device, characterized by the fact that the pre-drying chamber, originating from a double-walled cover through which a cooling medium flows and over which the dry material by means of a driving device is moved away, projects into the gas producer.

Germany 387,292

RUNOFF GAS GENERATOR

Wilhelm Hoffmann, Düsseldorf, Germany

Mar. 4, 1921; published Dec. 28, 1923.

Gr. 3, Cl. 24e

The invention concerns a runoff gas producer which is characterized by the fact that all the gasification air is passed through the molten material from top toward the bottom, in such fashion that the liquid slag and the entire quantity of gas are made to flow through the gas generator in the same direction.

Germany 391,936

PROCESS FOR THE PRODUCING OF MIXED GAS IN TWO GAS GENERATORS

Werner Alfred Paul Berg, Kobe, Japan

Apr. 8, 1921; published Mar. 13, 1924.

Gr. 3, Cl. 24e

The invention concerns a process for producing

mixed gas in alternating operation in two momentarily hot blown shafts and between the latter a superheater for receiving the waste heat of the hot blowing gases, characterized by the fact that the gas produced by the first-producer shaft is passed, after being superheated in the superheater, from below to above, through the second shaft.

Germany 392,338

**WATER-GAS PRODUCER WITH WASTE-HEAT STEAM BOILER**

Berlin-Anhaltische Maschinenbau A. G., Berlin, Germany

*Oct. 14, 1921; published Mar. 20, 1924.*

*Gr. 1, Cl. 24e*

The invention concerns a water-gas producer with waste-heat steam boiler, characterized by the fact the entire space of the tubular boiler, which is traversed by the hot heating gases, is filled with heat-storing bodies which are of a known type.

Germany 393,800

**PROCESS AND APPARATUS FOR THE GASIFICATION OF CAKING FUELS IN TWO INTERCONNECTED SHAFTS**

Friedrich Godfried Carl Rincken, Watergraafsmeer, Netherlands

*July 16, 1919.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the gasification of caking fuels in two interconnected shafts, in which the fuel is hot blown not in layers and is converted to water gas, and the highly heated water gas is used for the distillation of the fuel, characterized by the fact that in one of the shafts, while the connection with the other degassing shaft is cut off, during the hot blowing times, water gas is produced until the fuel which is being distilled in the degasification shaft has been distilled.

Germany 394,696

**GAS PRODUCER IN WHICH THE GASES ARE PASSED THROUGH A PIPE LYING ON THE CENTRAL AXIS**

Hermann Franke, Hanover, Germany

*Apr. 24, 1921.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer in which the gases are passed through a pipe lying on the central axis, characterized by the fact that the fuel travels from the charging hopper into the drying room which is conical, and which broadens out toward the bottom, and which is annular in shape; and is passed from there to the distillation chamber, which is likewise conical and tapering; and through the gasification chamber connected to said distillation chamber, to the outward-sloping ash grate.

Germany 395,648

**GAS PRODUCER FOR PULVERIZED FUELS**

Jules Babin, Paris, France

*July 23, 1922.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer for pulverized fuels in mixture with water, characterized by the fact that in the pipe into which the gasification air flows under pressure from bottom to top, a pipe charged by the hopper and open at the top is built in, the upper part of which is covered with a fireproof wall, and which connects below with a spiral pipe equipped with a water-spray inlet, and with the ashpit next to the gas outlet, which ashpit is connected to the said spiral pipe.

Germany 396,303

**GAS PRODUCER**

Willy Jentzsch, Schmölln, Germany

*Aug. 9, 1922.*

The invention concerns a gas producer, characterized by an air reservoir in the ashpit, from which the heated air is passed through ducts to a group of pipes which penetrate the freshly delivered pile of coal.

Germany 398,881

**GAS PRODUCER WITH COAXIAL SUPERIMPOSED WASTE-GAS PREDRYER**

Hermann Franke, Hanover, Germany

*Apr. 28, 1921; published July 21, 1924.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer in accordance with Patent 394,696, with coaxial superimposed waste-gas pre-dryer, characterized by the fact that the gas-producer casing and waste-gas-predryer casing are integrally connected with each other by means of rib-like parts, and can be rotated on a bearing.

Germany 398,882

**GAS PRODUCER**

Hermann Franke, Hanover, Germany

*Supplement to 394,696. Apr. 29, 1929; published*

*July 21, 1924.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer in accordance with Patent 394,696, characterized by the fact that the part of the gas pipe which serves to pass off the gases formed in the distillation and fire sections inside the gas producer is composed of a rotating hollow metal body, which is filled with water.

Germany 400,149

**PROCESS FOR THE UTILIZATION OF THE WASTE HEAT FROM A WATER-GAS PRODUCER IN A HEAT ACCUMULATOR AND BOILER**

Berlin-Anhaltische Maschinenbau A.G., Berlin, Germany

*Aug. 16, 1921; published Aug. 2, 1924.*

*Gr. 1, Cl. 24e*

The present invention concerns a process for the utilization of the waste heat from a water-gas producer in a heat accumulator and boiler, characterized by the fact that during hot blowing the waste gases from the water-gas producer are passed through the heat accumulator and the boiler, whereas during the gasification process, another heat-conveying gas is so passed.

Germany 401,685

**PROCESS FOR THE OPERATION OF WATER-GAS PRODUCERS WORKING TOGETHER IN PAIRS**

Johannes Jehnigen, Mülheim, Germany

*Sept. 6, 1921; published Sept. 9, 1924.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the operation of water-gas producers working together in pairs, the chambers of which are located above the fuel bed and are interconnected with each other, characterized by the fact that the gas-producer pair, both during hot blowing and during gasification is connected behind each other in alternating series in such fashion that both gas producers are traversed by the hot blast air and the steam in directions opposite each other, whereby during the hot blowing periods additional hot blowing air is passed to the second-connected gas producer.

Germany 401,686

**PROCESS AND APPARATUS FOR THE INTERMEDIATE REMOVAL OF BITUMINOUS MATERIALS TREATED IN SHAFTS**

Deutsche Erdöl A.G.

*Dec. 24, 1922.**Gr. 3, Cl. 24e*

The invention concerns a process for the intermediate removal of bituminous materials treated in [gasification] shafts on a natural slope [of the fuel] formed by means of an extension of the shaft, characterized by the fact that the slope [of the fuel] which, in a state of repose extends to the over-fall edge and is supported thereby, is regulated by raking rods which can be manipulated from outside, in such fashion that the topmost layer of the slope [of fuel] slips downward and falls over the overfall lip into the removal chamber.

Germany 401,723

**PROCESS FOR THE UTILIZATION OF THE WATER VAPOR WHICH ARISES WHEN THE COKE IS EXTINGUISHED IN GAS-PRODUCER SYSTEMS**

Kohlenscheidungs G.m.b.H., Berlin, Germany

*Apr. 26, 1921**Gr. 3, Cl. 24e*

The invention concerns a process for utilization of the water vapor which arises when the coke is extinguished in gas-producer systems, characterized by the fact that the steam is siphoned from its point of origin by introduction of the necessary gasification air and is passed to the gas producer.

Germany 403,553

**WATER-GAS PRODUCER WITH SUPERIMPOSED STEAM BOILER HEATED BY THE WARM BLOWING GASES**

Wilhelm Neu, Zweibrücken, Germany

*Oct. 18, 1919; published Oct. 1, 1924.**Gr. 1, Cl. 24e*

The invention concerns a water-gas producer with superimposed steam boiler heated by the warm blowing gases, characterized by the fact that the combustion area of the warm blowing gases is located directly over the gas producer charge, and that the device for venting the waste gases is arranged behind the boiler tubes.

Germany 404,717

**GAS PRODUCER WITH SHAFT TAPERING DOWNWARD AND AN ASHPIT CONNECTED TO THE SAID WIDENING OUT SHAFT**

Herbert L. H. Schmidt, Charlottenburg, Germany

*May 21, 1921; published Oct. 21, 1924**Gr. 3, Cl. 24e*

The invention concerns a gas producer with a shaft which tapers at the bottom and an ashpit connected to it which widens out, characterized by the fact that the blast orifices are located in the lower, widened out part of the shaft.

Germany 415,275

**PROCESS FOR OPERATION OF GAS PRODUCER AND APPARATUS THEREFOR**

Ervin Francis Murray, London, England

*Oct. 12, 1922; published June 17, 1925**Gr. 2, Cl. 24e*

The invention concerns a process for operation of a gas producer with a retort arranged above the gasification shaft, which is heated by combustion of the blowing gases in the passages surrounding the retort, characterized by the fact that the useful gases are drawn off at a place in the retort where the fuel has already released the greater part of the tarry ingredients, whereupon they are conducted through pipes located in

the retort enclosure and heated by combustion of the blowing gases, while the volatile ingredients from distillation which have been driven out of the upper part of the retort are passed at low temperatures through pipes into the incandescent zone of the gasification zone in order to be converted into stable gases.

Germany 420,149

**PROCESS FOR THE PRODUCTION OF GASEOUS FUEL**

Thomas Anderson Reid, London, England

*Mar. 18, 1923; published Oct. 20, 1925.**Gr. 3, Cl. 24e*

The invention concerns a process for the production of gaseous fuel, whereby a generator gas coming from a generator is burned in a limekiln and thereupon the limekiln gases are passed through the incandescent fuel bed in the generator, characterized by the fact that only a part of the generator gas is burned in the limekiln, and another quantity in the reduction shaft, in order to heat the limekiln gases, traversing the incandescent fuel, to operating temperature.

Germany 422,663

**PROCESS AND APPARATUS FOR THE PRODUCTION OF COMBUSTIBLE GASES FROM A MIXTURE OF CARBON CONTAINING DUST AND OXYGEN CARRIERS IN A CLOSED CHAMBER**

Max Klötzer, Dresden, Germany

*Aug. 19, 1922.**Gr. 3, Cl. 24e*

The invention concerns a process for the production of combustible gases from a mixture of carbon containing dust and oxygen carriers in a closed chamber, characterized by the fact that the mixture for gasification blown into the chamber over an incandescent slag bath is intimately mixed by alternately supplying counter current and parallel flow by means of a pump.

Germany 422,999

**PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF WATER GAS**

Hermann Hillebrand, Friedrichshafen, Germany

*Jan. 28, 1922; published Dec. 17, 1925.**Gr. 1, Cl. 24e*

The invention concerns a process for the continuous production of water gas in accordance with which the necessary quantity of heat for forming the water gas is introduced through a flow of gas traversing the gas producer and the heater, characterized by the fact that the stream of gas, after release of the reaction heat and before reheating begins, is subjected to cooling off.

Germany 427,038

**GAS PRODUCER FOR THE LOW-TEMPERATURE CARBONIZATION AND GASIFICATION OF FINE-GRANULAR OR PEATLIKE FUELS**

Siegener Maschinenbau A. G. and Alfred Menzel, Siegen, Germany

*Feb. 15, 1924; published Mar. 22, 1926**Gr. 4, Cl. 24e*

The invention concerns gas producers for the low-temperature carbonization and gasification of fine-granular or peatlike fuels, in which carbonization takes place through the sensible heat of the pure gases, characterized by the fact that the heating chambers, which are open below and limited by heating surfaces which project obliquely into the shaft, are connected with a connecting system of ducts by means of channels in the shaft wall, which system can be traversed by the pure gases as far as the gas offtake without crossing through any layers of fuel.

Germany 428,143

## CARBONIZATION AND GASIFICATION SYSTEM

Rudolf Zeidler, Station Tienhaara bei Wiborg, Finland

*Mar. 18, 1923; published Apr. 24, 1926.**Gr. 4, Cl. 24e*

The invention concerns a carbonization and gasification system in accordance with which gasification takes place on a traveling grate, characterized by the fact that carbonization also is undertaken on the traveling grate, and by the fact that the gases flow through the fuel on the gasification grate from bottom to top and then flow through the carbonization grate from top to bottom.

Germany 427,286

## PROCESS AND APPARATUS FOR THE PRODUCTION OF GENERATOR OR WATER GAS

Harald Nielsen, London, and Bryan Laing, Hatfield, Great Britain

*Apr. 12, 1924; published Mar. 30, 1926.**Gr. 3, Cl. 24e*

The invention concerns a process for the production of generator or water gas in a rotating drum heated from within by means of ignited pulverized coal, according to which the fuel which reduces the pulverized coal flame moves in an opposite direction, characterized by the fact that the reductive pulverized fuel is fed in an opposite direction to the combustion gases of the pulverized coal flame and the steam introduced, and is thereby agitated by a reciprocating device which constricts the gas flow.

Germany 427,288

## WATER-GAS GENERATOR

Mathias Fränkl, Augsburg, Germany

*Sept. 27, 1924; published Apr. 10, 1926.**Gr. 1, Cl. 24e*

The invention concerns a water-gas generator equipped with heat-storing chambers located in the gasifier wall which are traversed alternately by the burned blow gases and the hot water gas characterized by the fact that evaporators which are open at the bottom are swept by the burned blow gases at the outside and by the hot water gas on the inside while on the other side water is sprayed into the evaporators to produce the steam needed for the production of water gas.

Germany 431,136

## HEARTH WITH TRAVELING GRATE AND SLAG GENERATOR CONNECTED TO IT

Max Birkner, Bergisch Gladbach, Germany

*Jan. 27, 1923; published July 2, 1926. The principal patent began on Sept. 28, 1918.**Gr. 3, Cl. 24e*

The invention concerns a hearth with traveling grate in accordance with Patent 409,766, and a slag generator connected to it, characterized by the fact that special devices for breaking up the hard masses of slag are provided for above the breaking and crushing rollers.

Germany 431,137

## GAS PRODUCER FOR THE PRODUCTION OF FUEL GASES FROM PULVERIZED FUEL

Pierre Hugo Ledebuer, Caen, France, and Paul Jamotte, Brussels, Belgium

*Sept. 29, 1922; published July 2, 1926.**Gr. 3, Cl. 24e*

The invention concerns a gas producer for the production of fuel gases from pulverized fuel, which is blown through a masonry checkerwork together with steam, the said checkerwork being housed in the gasi-

fication chamber and being highly heated and heat accumulative; characterized by the fact that the said masonry checkerwork filling is made of very small pieces, as is customary in the case of so-called flameless firing.

Germany 431,267

## APPARATUS AND PROCESS FOR UTILIZATION OF GENERATOR RESIDUES

Firma Collin &amp; Co. and Josef Schäfer, Dortmund, Germany

*Sept. 9, 1923; published July 6, 1926.**Gr. 3, Cl. 24e*

The invention concerns an apparatus for the utilization of generator residues in accordance with which underneath the inlet for the gasification medium, the generator residues are regasified by air, characterized by the fact that at a distance under the grate of the main generator, the residue generator is located, which is able to receive the residue which falls away from the main generator over a protracted period of time.

Germany 431,677

## PROCESS AND APPARATUS FOR THE GASIFICATION OF CRUDE FUELS, PARTICULARLY FUELS RICH IN WATER AND OIL SHALES, IN ANNULAR GAS PRODUCERS

Friedrich Jahns, Georgenthal, Germany

*Mar. 5, 1924; published July 20, 1926.**Gr. 7, Cl. 24e*

The invention concerns a process for the gasification of crude fuels, particularly fuels rich in water and oil shales, in annular gas producers, characterized by the fact that the chambers of the ring which are respectively used as drying and distillation shafts are heated from outside by the hot gases obtained from gasification residues, or with the hot gases from another chamber of the ring.

Germany 431,891

## GAS PRODUCER WITH THE LOW-TEMPERATURE DISTILLATION CHAMBER SUPERIMPOSED ON THE GASIFICATION SHAFT

Firma Naamlooze Vennootschap Machinerieën en Apparaten-Fabrieken, Utrecht, Holland

*July 17, 1924; published July 23, 1926.**Gr. 4, Cl. 24e*

The invention concerns a gas producer with the low-temperature distillation chamber superimposed on the gasification shaft, the said distillation chamber having walls which are entirely or partially composed of water pipes, which are connected both at the top and at the bottom with an annular-shaped collector pipe, characterized by the fact that on the annular-shaped cover of the gasification shaft several connecting offtake pipes for the gasification gas are arranged, which empty into a common collector duct arranged around the distillation chamber.

Germany 435,614

## GAS PRODUCER FOR THE DISTILLATION AND GASIFICATION OF PEATLIKE FUELS

Alfred Menzel, Siegen

*June 15, 1924; published Oct. 15, 1926.**Gr. 4, Cl. 24e*

The invention concerns a gas producer for the low-temperature distillation and gasification of peatlike fuels, in which the distillation takes place by means of internal heating by the use of the sensible heat of the pure gases and in a supplementary fashion by means of external heating by the use of heating gases, characterized by the fact that the introduction of the supplementary heating gases occurs directly during the passage [of the pure gases] from the gasification chamber to the distillation chamber, and in a quantity

and at a temperature which are regulated in such fashion that the outside heating gases first take on heat from the pure gases and then are delivered to the fuel in the distillation and drying chamber together with the remaining heat of the pure gases themselves.

Germany 437,914

**TRAVELING GRATE FURNACE WITH SLAG CARBURETOR CONNECTED TO IT**

Max Birkner, Berg, Gladbach

Jan. 27, 1923; published on Nov. 30, 1926.

Gr. 3, Cl. 24e

The invention concerns a furnace with a traveling grate and a slag carburetor in accordance with Patent 409,766, the rectangular shaft opening of which widens out on the narrow sides, characterized by the fact that on the long sides also the shaft is widened out by means of sloping [the sides].

Germany 437,970

**PROCESS FOR THE PRODUCTION OF WATER GAS**

I. G. Farbenindustrie A.G., Frankfurt am Main, Germany

Sept. 28, 1922; published Dec. 2, 1926.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas in a layer of fine-granular fuel, characterized by the fact that air, as well as steam, are blown into the gas producer from below in such fashion that the fine-granular material, throughout the entire height of the fuel bed, is placed in whirling up-and-down motion.

Germany 439,011

**PROCESS AND APPARATUS FOR THE PRODUCTION OF GAS FROM COAL DUST**

Carl Hilker, Mährisch Ostrau, Czechoslovakia

Jan. 14, 1923.

Gr. 3, Cl. 24e

The invention concerns a process for the production of gas from coal dust, in accordance with which the coal dust falls downward inside a vertical shaft, from which the gas is led away below, characterized by the fact that the air needed for the gasification is first introduced at the lower part of the shaft, while the coal dust which is introduced without any substantial velocity of its own and without conduction by air travels solely under the influence of gravity and is degasified in the process.

Germany 439,875

**GAS PRODUCER FOR THE GASIFICATION OF CRUDE LIGNITE**

Francke Werke Komm. A.G., Bremen, Germany

Apr. 23, 1922.

Gr. 4, Cl. 24e

The invention concerns a gas producer for the gasification of crude lignite, characterized by the fact that it is equipped with a bell receiver over the upper part of which a hood with slits is inverted, and in the lower part of which a cone is set, in connection with a gas offtake ring surrounding the bell receiver, and the slits of which are at about the same height as the gas inlet openings of the bell receiver.

Germany 440,893

**GAS PRODUCER FOR LOW-TEMPERATURE DISTILLATION AND GASIFICATION OF GRANULAR MOIST BROWN COAL**

Francke Werke A. G., Bremen, Germany

June 5, 1924.

Gr. 4, Cl. 24e

The invention concerns a gas producer for low-temperature distillation and gasification of granular moist

raw brown coal characterized by a step grate surrounding the rotating grate and a device suspended inside the gas producer over the rotating grate with a central gas offtake and an adjustable closure.

Germany 442,259

**WATER-GAS PRODUCER**

Johannes Trenkmann, Berlin-Charlottenburg, Julius Pintsch A.G., Berlin, Germany

Nov. 26, 1922.

Gr. 2, Cl. 24e

The invention concerns a water-gas producer characterized by the fact that gasification gas, previously preheated in a checker-brick-filled chamber by burned hot blow gases, is admitted to the drying and distillation shaft. The chamber is connected to the upper end of the gasification shaft and midway to the drying and distillation shaft.

Germany 443,445

**PROCESS FOR THE PRODUCTION OF WATER GAS AND OF OTHER FUEL GASES**

Fritz Winkler, Ludwigshafen am Rhine, Germany I. G. Farbenindustrie A.G., Frankfurt am Main

May 7, 1925.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas and other fuel gases in a layer of fine-granular fuel with turbulation of the gasification material in accordance with Patent 437,970, characterized by the fact that air is blown into the hot blowing gases which contains the pulverized fuel after leaving the fuel bed, is in an appropriately highly heated condition, and in such quantity that the solid fuel, suspended in the warm blowing gas, is gasified except for a negligible residue.

Germany 446,190

**HEAT ACCUMULATOR FOR UTILIZATION OF THE BLOWING GASES OF GAS PRODUCERS WITH ALTERNATING OPERATION**

Ludwig Gerhardt, Nordhausen, A.G., für restlose Vergasung, Nordhausen, Germany

July 21, 1925.

Gr. 1, Cl. 24e

The invention concerns a heat accumulator for utilization of the blowing gases of gas producers with alternating operation, in which steam is produced by spraying water on a part of the accumulator charge and its superheated at another part of the charge, characterized by the fact that the vaporizer part of the charge is under the superheater part.

Germany 446,346

**GAS PRODUCER FOR THE HEATING OF GENERATOR OVENS**

Rudolf Geipert, Berlin-Mariendorf, Germany

Nov. 21, 1923; published June 28, 1927.

Gr. 7, Cl. 24e

The invention concerns a gas producer for heating generator ovens with a coke column, in accordance with Patent 431,269, placed on the oven side and serving for the cracking of the bituminous gasification products, characterized by the fact that the coke column is formed upon discontinuance of the [gasification] shaft dividing partition, through bringing in the coke on the oven side of the shaft and the bituminous coal on the side of the shaft turned toward the gas outlet.

Germany 446,678

## PROCESS FOR THE PRODUCTION OF WATER GAS

I. G. Farbenindustrie A.G., Frankfurt am Main, Germany

Mar. 14, 1925.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas in accordance with Patent 437,970, characterized by the fact that the gasification media are blown through tuyères or slits, as the case may be, which are arranged in the sloping walls of the lower part of the generator, which sloping walls converge bottomward.

Germany 447,558

## GENERATOR FOR GASIFICATION OF COAL DUST

Fritz Hinze, Düsseldorf, Germany

Nov. 24, 1925.

Gr. 3, Cl. 24e

This invention concerns a generator for the gasification of coal dust, in accordance with which the gas is drawn through dispersed coal dust, characterized by the fact that in the feeder located at the top, a multiple bell structure is arranged, over which the dispersed coal dust flows downward, the said structure forcing the gases arising in the generator shaft to penetrate the dispersed fuel several times before they reach the gas-offtake pipe.

Germany 450,075

## PROCESS AND APPARATUS FOR THE PRODUCTION OF STEAM FOR WATER-GAS GENERATORS

Francke Werke A.G., Bremen, Germany

June 11, 1922.

Gr. 1, Cl. 24e

This invention concerns a process for the production of steam for water-gas generators in a steam producer connected with a heat storage apparatus, through which steam producer the hot blowing gases are passed during hot blowing, in the course of which the said gases give up a part of their heat to the heat accumulator and a part to the steam producer, characterized by the fact that during the gasification period, the water gas produced simultaneously carries over its own sensible heat and heat from the heat storage apparatus to the steam producer, the heating surfaces of which are touched by the storage charge.

Germany 450,076

## PROCESS AND GASIFICATION SHAFT FURNACE FOR THE UTILIZATION OF FUEL IN SMALL PIECES AND FUEL HIGH IN ASH

Stettiner Chamotte-Fabrik A.G., vormals Didier, Stettin, Germany

Dec. 22, 1920.

Gr. 3, Cl. 24e

This invention concerns a process for the utilization of fuel in small pieces and fuel high in ash in a [gasification] shaft furnace with introduction of draft from the side, characterized by the fact that the draft is passed through a high, porous checkerwork lying between the blast orifices and the combustion zone, and is thereby uniformly distributed over the cross section of the [gasification] shaft.

Germany 450,326

## PROCESS FOR UTILIZATION OF THE WASTE HEAT PRODUCED DURING WATER-GAS OPERATIONS FOR THE PRODUCTION OF STEAM

Bamaq-Mequin A.G., Berlin, Germany

June 5, 1925.

Gr. 1, Cl. 24e

The invention concerns a process for utilizing all the

waste heat produced during water-gas operations for the production of high-pressure steam, characterized by the fact that the cooling water for the generator hood is allowed to circulate through a heat-exchange device, in which the feed water of the waste-heat boiler is preheated.

Germany 450,460

## PROCESS AND APPARATUS FOR GASIFICATION OF FINE-GRANULAR AND/OR PULVERIZED FUELS

Wilhelm Schwier, Düsseldorf-Rath, Germany

Feb. 2, 1924.

Gr. 3, Cl. 24e

The invention concerns a process for the gasification of fine-granular and/or pulverized fuels, particularly fuels with a high ash content, characterized by the fact that fuel and air, are blown into or through a molten filter bath of highly heated molten materials, which materials are themselves not combustible and not gasifiable.

Germany 451,361

## GASIFICATION SHAFT FURNACE FOR PROCESS IN ACCORDANCE WITH PATENT 450,076

Stettiner Chamotte-Fabrik A.G., vormals Didier, Stettin, Germany

June 16, 1921. Supplement to Patent No. 450,076.

Gr. 3, Cl. 24e

The invention concerns a gasification shaft furnace for the process in accordance with Patent 450,076 for the utilization of fuels in small pieces and with a high ash content, characterized by the fact that the blast-distribution zone located between the blast orifices and the combustion zone and filled with a porous checker work at an elevation at least as high as the width of the shaft and passes directly over into the combustion zone.

Germany

Germany 451,608

## PROCESS FOR THE PRODUCTION OF RICH GAS IN A HYDROCARBON GAS PRODUCER

Richard Nübling, Stuttgart-Gaisburg, and Robert Mezger, Stuttgart, Germany

Apr. 12, 1925.

Gr. 2, Cl. 24e

The invention concerns a process for the production of rich gas in a hydrocarbureted gas producer with introduction of the distilled tar oil released in the cooling device into the heat accumulator which is heated by hot blowing gases and serves as a carburetor, characterized by the fact that all the crude gas flowing out of the distillation shaft is passed to the purifier and the introduction of the decomposition products of the carburetion oils from the carburetion chamber into the gas producer takes place without the use of the crude gases flowing out of the distillation shaft.

Germany 452,015

## PROCESS AND APPARATUS FOR THE GASIFICATION AND DEGASIFICATION OF COAL DUST IN A CURRENT OF GAS

Géza Szikla and Arthur Rozinek, Budapest, Hungary

July 30, 1925.

Gr. 3, Cl. 24e

The invention concerns a process for the gasification and/or degasification of coal dust, in accordance with which pulverized or fine-granular coal is driven into a rising flow of gas through a gasification shaft and is thereby gasified and/or degassed with a limited addition of oxygen, characterized by the fact that in addition to the fresh quantity of coal dust, the as yet un-

gasified incandescent fuel dust swept along by the gas is wholly or partially introduced into the gasification chamber, and the said ungasified fuel dust is returned to the gasification shaft, after being released from the flow of gas.

Germany 452,401

**WATER-GAS PRODUCER**

Körting & Ahrens G.m.b.H., Hanover, Germany

*Apr. 22, 1925.*

*Gr. 2, Cl. 24e*

The invention concerns a water-gas producer with a gasification retort and an internal furnace boiler surrounding the said gasification retort, characterized by the fact that the gasification area is only connected with the annular space between the retort and the boiler, the said annular space being traversed from bottom to top by the blowing gases, after which the said blowing gases flow from above into the small flues, and through the outlet pipe lying below, empty to the outside atmosphere.

Germany 452,867

**WATER-GAS PRODUCER WITH GASIFICATION RETORT AND STEAM BOILER ENCASING THE LATTER**

Körting & Ahrens G.m.b.H., Hanover, Germany

*Aug. 19, 1925.*

*Gr. 2, Cl. 24e*

The invention concerns a water-gas producer with a gasification retort and a steam boiler encasing the latter in accordance with Patent 452,401, characterized by the fact that between the rising annular passage surrounding the retort and the inner wall of the boiler, a descending passage is delimited by means of a fire bridge.

Germany 454,873

**PROCESS FOR THE PRODUCTION OF A GAS OF HIGH VALUE IN A WATER-GAS PRODUCER SYSTEM**

Karl Wolinski, Berlin, Germany

*Dec. 13, 1925.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of a gas of high [calorific] value in a water-gas producer system with introduction of a flow of gas into the gasification chamber, the said flow of gas being heated by using the waste heat of the gas, characterized by the fact that the heat content of the useful gases which have been highly heated, in order to fix the crude tar vapors, is used to heat the flow of hot gas.

Germany 455,066

**PROCESS FOR THE GASIFICATION OF DUSTY, MOIST CRUDE LIGNITE WITHOUT OBTAINING AMMONIA**

Allgemeine Vergasungs G.m.b.H., Berlin-Halensee, Germany

*June 1, 1923.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of dusty, moist crude lignite without obtaining ammonia, characterized by the fact that the gasification air is preheated to over 300° and that the fresh fuel in the upper layers of the gas producer itself is thereby predried through the sensible heat of the high-moving gas.

Germany 455,464

**PROCESS FOR THE GASIFICATION OF WET, DUSTY CRUDE LIGNITE**

Reischach & Co., G.m.b.H., Berlin, Germany

*Aug. 16, 1922.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of wet, dusty crude lignite in a shaft generator with

a vertical flow direction, characterized by the fact that the gasification material is fed continuously in thin layers to the gas producer and at the same time a quantity of heat coming from another heat source—for example, highly heated gasification air—is fed to the drying zone in such measure that for each kilogram of gasified coal being fed, not more than about 40% of the moisture content must be removed by the outside heating of the coal.

Germany 457,498

**PROCESS FOR THE GASIFICATION OF FUELS CONTAINING DUST IN RUNOFF GAS PRODUCERS**

Carlshütte für Eisengiesserei und Maschinenbau, Waldenburg-Altwasser, Germany

*Nov. 25, 1924.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of fuels containing dust in runoff gas generators with a gas accumulator area to diminish the velocity of the gas, characterized by the fact that the gases which rise out of the gasification shaft with high heat of their own, are cooled down by means of admixture of gas or steam to a temperature below dull-red heat, before the said gases enter the gas accumulation area, whereupon the said gases traverse sideways, by means of jalousie-type walls, the limiting forechambers of the gas accumulation chamber at a reduced rate of speed and are thus freed of their dust content.

Germany 457,726

**PROCESS FOR THE GASIFICATION OF FINE-GRANULAR, DUSTY, OR EARTHY CRUDE LIGNITE IN A GENERATOR**

Städtlich Sächsische Hüttenwerke, Freiberg, and Paul Rosin, Dresden, Germany

*Nov. 30, 1923.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of fine-granular, dusty, or earthy crude lignite in a generator, characterized by the fact that the lignite is brought to a bed-height of 40 centimeters at the most, on a grate which distributes air finely and uniformly (sieve grate), and by the fact that air pressure over the grate is held down in such fashion that the formation of craters does not occur.

Germany 458,074

**PROCESS FOR THE GASIFICATION OF PULVERIZED FUELS**

I. G. Farbenindustrie A.G., Frankfurt am Main, Germany

*Dec. 2, 1922.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of pulverized fuels in dust generators for the obtaining of gases for the synthesis of ammonia and for hydro-generation, characterized by the fact that the pulverized fuels are gasified with oxygen or with oxygen-air mixtures.

Germany 458,265

**GAS PRODUCER FOR THE DEGASIFICATION AND GASIFICATION OF FINE-GRANULAR FUELS AND PULVERIZED FUELS**

Heinrich Stokowy, Ratowice, Poland

*May 14, 1924.*

*Gr. 4, Cl. 24e*

The invention concerns a gas producer for the degasification and gasification of fine-granular and pulverized fuels with an upper distillation chamber heated exclusively by means of generator gas passed through it, characterized by the fact that the gasification shaft is closed off from the distillation shaft by means of an arch which is equipped with passage openings on the periphery of the gasification shaft, and by the fact that



a rotating grate is arranged over the arch, which pushes the fuel over the arch toward the passage openings.

Germany 458,879

PROCESS FOR THE GASIFICATION AND DISTILLATION OF DUSTY, MARSH-DAMP FUELS SUCH AS CRUDE LIGNITE

Conrad Arneemann, Halle, Germany

Feb. 12, 1922.  
Gr. 3, Cl. 24e

The invention concerns a process for the gasification and distillation of dusty, marsh-damp fuels, such as crude lignite, characterized by the fact that the fuel is sized by sieving the fuel into pieces and pulverized fuel, and the part of the fuel in pieces is fed to the generator, whereas the pulverized part is burned in a combustion chamber in the lower part of the generator and the combustion gases arising therefrom are passed through the generator shaft in order to dry, distill and degas the pieces of fuel.

Germany 459,052

PRODUCER-GAS SYSTEMS IN WHICH THE FINE-GRAULAR FUEL IS DRIVEN THROUGH AGITATORS OVER SEVERAL PLATES CONNECTED BEHIND EACH OTHER TOWARD THE GASIFICATION AREA

Hans Wiedemann, Berlin-Charlottenburg, Germany

July 20, 1924.  
Gr. 4, Cl. 24e

The invention concerns a producer-gas system in which the fine-granular fuel is passed through agitators over several plates connected behind each other toward the gasification area, characterized by the fact that the agitators are operated independently from the plates which are arranged next to each other and connected with each other by conveyor apparatus.

Germany 459,053

ANNULAR GAS PRODUCER FOR THE GASIFICATION OF CRUDE FUELS HIGH IN MOISTURE

Friedrich Jahns, Georgenthal, Germany

Supplement to 431,677. Oct. 1, 1924.  
Gr. 7, Cl. 24e

The invention concerns an annular gas producer for the gasification of crude fuels high in moisture with external heating of the chambers operating both as drying and distilling chambers in accordance with Patent 431,677, characterized by the fact that the external heating of the shafts takes place by means of combustion gases which are produced in a special chamber not inside the chambers connected into the annular operation.

Germany 460,759

PROCESS FOR THE PRODUCTION OF A HIGH CALORIFIC VALUE GAS SIMILAR TO ILLUMINATING GAS IN A GENERATOR SYSTEM

Bamag-Mequin A.G., Berlin, Germany

Oct. 9, 1925.  
Gr. 2, Cl. 24e

The invention concerns a process for the production of a high calorific value gas similar to illuminating gas in a system composed of a double gas generator, a heat storage and/or carbonizing chamber, and a supplementary distillation shaft internally heated by the gas mixture leaving the said carbonization chamber, characterized by the fact that distillation tar is introduced into the carbonization chamber simultaneously with the water gas going over from the generator, the said tar being released from the gas mixture leaving the supplementary distillation chamber.

Germany 461,481

PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF WATER GAS OR A PRODUCER GAS HIGH IN HYDROGEN OR CARBON MONOXIDE FROM A PULVERIZED FUEL

Karl Fischer, Berlin-Zehlendorf, Germany

Nov. 27, 1924.  
Gr. 1, Cl. 24e

The invention concerns a process for the continuous production of water gas or a generator gas high in hydrogen or carbon monoxide from a pulverized fuel, in accordance with which the fuel is gasified in suspension in the gasification medium, characterized by the fact that the heat required to gasify the fuel is supplied through radiant heat by means of a flame maintained by the gas producer.

Germany 462,309

PROCESS FOR OBTAINING GASES OF HIGH CALORIFIC VALUE BY MEANS OF THE BITUMINOUS COAL WATER-GAS PROCESS

Richard Nübling, Stuttgart-Gaisburg, and Robert Mezger, Stuttgart, Germany

May 6, 1925.  
Gr. 2, Cl. 24e

The invention concerns a process for the obtaining of gases of high calorific value by means of the bituminous coal water-gas process, characterized by the fact that in the known process for the production of carbureted water gas using stored heat for heating the circulating gases and for superheating the steam, instead of a blowing period with utilization of air, a semi-water-gas period using a mixture of steam and air is applied which, as the proportion of steam increases, makes it possible for the said proportion of steam, as a result of the greater reaction and sensible heat in the semi-water-gas produced during combustion with air, to store more heat, and as circulation proceeds during the gas process, to produce more distillation gas in proportion to water gas, and thus increase the calorific value of the carbureted water gas.

Germany 462,607

CARBURETORS FOR MOIST LIGNITE

Albert Kaden, Berlin, Germany

Apr. 5, 1925.  
Gr. 4, Cl. 24e

The invention concerns a carburetor for moist lignite with an annular distillation and drying shaft heated internally and externally and separate outlets for the distillation and product gases, characterized by the presence of a stationary basket grate and beneath the said basket grate a rotatable ashpit forming a water cutoff; and by the presence of a standing grate surrounding the gasification zone, which grate connects the interior of the shaft with the annular chamber which takes in the major lower part of the shaft wall; and by the presence of a central telescope-type extendable product gas offtake pipe.

Germany 465,045

PROCESS AND ARRANGEMENT FOR THE OPERATION OF A WATER-GAS SYSTEM

Humphreys & Glasgow, Ltd., London, United Kingdom

May 7, 1924  
Gr. 1, Cl. 24e

The invention concerns a process for the operation of a system for the production of carbureted water gas consisting of a gas producer and superheater and, if necessary, a carburetor for vaporizing oil connected between them; the said process providing for returning the steam through the superheater and the carburetor

toward the gas producer during alternating upward and downward gasification, characterized by the fact that a part of the water gas produced in this return-flow gasification is placed in repeated circulation with the return-flow fresh steam.

Germany 467,143

**PROCESS AND APPARATUS FOR GASIFICATION IN ANNULAR GAS PRODUCERS**

Friedrich Jahns, Georgenthal, Germany  
*Supplement to 431,677. June 15, 1926.*  
*Gr. 7, Cl. 24e*

The invention concerns a process for the gasification of fuels in annular gas producers in accordance with Patent 431,677, characterized by the fact that a heating chamber is closed off from the annular operation and is charged with fuel with a high calorific value.

Germany 467,561

**SYSTEM FOR THE CONTINUOUS PRODUCTION OF WATER GAS**

Gas-und Teer-G.m.b.H., Berlin, Germany  
*Supplement to 422,999. January 30, 1924.*  
*Gr. 1, Cl. 24e*

The invention concerns a system for the continuous production of water-gas by means of a circulating flow of gas in accordance with Patent 422,999, characterized by the fact that in a common heat storage of the gas producer and the heating chambers, heat-releasing or heat-receiving structural parts of the system, are built in.

Germany 468,095

**PROCESS AND ARRANGEMENT FOR UTILIZATION OF THE WASTE HEAT FROM THE BLOWING GASES IN THE WATER-GAS PROCESS**

Frankfurter Gasgesellschaft and Franz Reichard, Frankfurt am Main, Germany  
*Mar. 28, 1925*  
*Gr. 1, Cl. 24e*

The invention concerns a process for the utilization of the waste heat from the blowing gases in the water-gas process, with introduction of supplementary fuel for heating waste-heat boilers or the like, characterized by the fact that the supplementary combustion mixture is introduced continuously but in a throttled fashion during blowing, whereas the water gas does not traverse the boiler.

Germany 468,635

**EQUIPMENT FOR THE PRODUCTION AND CARBURETION OF WATER GAS**

Deutsche Koks- und Gas-G.m.b.H., Magdeburg, Germany  
*Mar. 6, 1924.*  
*Gr. 2, Cl. 24e*

The invention concerns equipment for the production and carburetion of water gas, whereby the superheater is located over the gas producer, and the pipe for injecting the carburetion medium empties into the open space between the upper surface of the fuel and the superheater, characterized by the fact that the outlet of the injection pipe is arranged at such a distance from the upper surface of the fuel that the latter cannot be reached by small liquid portions of the carburetion medium.

Germany 469,880

**GAS PRODUCER IN WHICH THE GASIFICATION MEDIUM IS PASSED IN A CROSSWISE FLOW THROUGH THE DOWNWARD MOVING FUEL**

Ivo Schwartz-Arnasy, Kassel, Germany  
*Mar. 12, 1925.*  
*Gr. 4, Cl. 24e*

The invention concerns a gas producer in which the

gasification medium is passed in a crosswise flow through the fuel which moves downward between jalousie-type passages and the vapor from the drying zone is removed separately, characterized by the fact that the entrance side of the gasification medium is composed of a number of rotatable, conical or spherical-hood type plates which slope downward and are provided with perforations, between the intervening spaces of which the stationary conducting surfaces of the outlet side encroach.

Germany 470,653

**WATER-GAS PRODUCER FOR THE GASIFICATION OF FINE-GRANULAR AND/OR PULVERIZED FUEL IN CONTINUOUS OPERATION**

Julius Pintsch, A.G., Berlin, Germany  
*Aug. 20, 1927.*  
*Gr. 1, Cl. 24e*

The invention concerns a water-gas producer for the gasification of fine-granular and/or pulverized fuel in continuous operation, in which the heat necessary for the production of water gas is charged into a stream of circulating gas flowing through a conversion chamber and a heater, characterized by the fact that the conversion chamber is arranged in a heat-tight fashion inside the annular heater surrounding it.

Germany 471,328

**GAS PRODUCER FOR THE PRODUCTION OF WATER GAS FROM PULVERIZED COAL AND WATER VAPOR**

Gas und Teer G.m.b.H., Berlin. Hermann Hillebrand, Berlin-Friedrichshagen, Germany  
*Aug. 25, 1927.*  
*Gr. 1, Cl. 24e*

The invention concerns a gas producer for the production of water gas from pulverized coal and water vapor in internally heated spaces, characterized by the fact that at their hottest ends these spaces are connected by means of a duct through which a part of the water gas produced in one or several of these spaces is passed to one or several of the remaining spaces for the heating thereof with combustion of the gas, and out of which the remainder of the gas produced is removed as useful gas.

Germany 471,329

**GAS PRODUCER FOR THE PRODUCTION OF WATER GAS FROM PULVERIZED COAL AND WATER VAPOR**

Gas und Teer G.m.b.H., Berlin. Hermann Hillebrand, Berlin-Friedrichshagen, Germany  
*Aug. 25, 1927*  
*Gr. 1, Cl. 24e*

The invention concerns a gas producer for the production of water-gas from pulverized coal and water vapor in spaces internally heated and provided with the capacity of the released heat, characterized by the fact that the spaces are subdivided by means of a separating wall which extends about as far as the mid-distance from the colder part to the hotter part.

Germany 471,823

**GAS PRODUCER WITH TWO COAXIALLY ARRANGED GAS PRODUCER CHAMBERS**

David Joseph Smith, Mapledurham, and Reginald Fitzroy Clayton, Marlow, United Kingdom  
*June 23, 1925.*  
*Gr. 7, Cl. 24e*

The invention concerns a gas producer with two gas producer chambers coaxially arranged, each with its own grate and fuel holder above same, characterized by the fact that the fuel holder is surrounded by an annular space and the outer gas production chamber is surrounded by an annular space, through which spaces

the gas produced escapes from the ashpit upward through an outlet; and by the fact that both annular spaces are surrounded by another annular space, through which the gasification air flows from below to above through the outer gas production chamber and gas offtake spaces into the fuel holder, for purposes of preheating.

Germany 477,581  
GAS PRODUCER FOR PULVERIZED FUELS  
Albert Ledebur, Herzogenrath, Germany

June 3, 1925.  
Gr. 3, Cl. 24e

The invention concerns a gas producer for powdered fuels with two connected chambers, in which, in the draft of the gasification first chamber pulverized fuel is introduced and as a gasification medium air is for the most part introduced, and in the second chamber for the most part steam is introduced, characterized by the fact that the combustion chamber is arranged on top of the gasification chamber, so that, if necessary, any ungasified fuel in the combustion chamber will fall through the gasification chamber and be completely gasified in it.

Germany 478,742  
PROCESS FOR THE PRODUCTION OF CARBURETED WATER GAS

Humphreys & Glasgow, Ltd., London, United Kingdom  
Oct. 9, 1925. Patent applied for in the U.S.A.  
Oct. 31, 1924.  
Gr. 2, Cl. 24e

The invention concerns a process for the production of carbureted water gas in water-gas producer sets with a carburetion apparatus connected to the gas producers and heated by the warm blowing gases, characterized by the fact that the carburetion apparatus is disconnected from the operation during downward gasification, and in accordance with this process, is neither—as in the old process—used for the carburetion of the water-gas produced by the downward gasification, nor—as in the case of the so-called reverse-flow gases—used for superheating the steam.

Germany 479,028  
HYDROCARBON GAS PRODUCER SET OPERATING WITH A FIXING MEDIUM HEATED BY MEANS OF THE BLOWING GAS

Bamaq-Meguain A. G., Berlin, Germany  
Dec. 2, 1925.  
Gr. 2, Cl. 24e

The invention concerns a water-gas producer set operating with a fixing medium heated by means of the blowing gases, with a connected column of fuel for complete gasification, characterized by the fact that at the place of transition between the gasification chamber which is charged with steam from below, and the distillation chamber located above the said gasification chamber, a cooling gas is introduced which, together with the simultaneously produced hot water gas, flows through the crude coal to be distilled.

Germany 479,029  
GAS PRODUCER FOR CARBURETED WATER GAS  
Frankfurter Gasgesellschaft and Ernst Schmacher, Frankfurt am Main, Germany

Jan. 3, 1925.  
Gr. 2, Cl. 24e

The invention concerns a gas producer for carbureted water gas starting with coke and the introduction of a mixture of water vapor and oil vapor in the fuel column, characterized by the fact that the lower part of the shaft operates as a conventional gas producer, whereas the upper part serves for the cracking

of the mixture of water vapor and oil vapor introduced at the point of separation of the two parts of the shaft, and is kept at a correspondingly lower temperature.

Germany 479,030  
PROCESS FOR THE GASIFICATION OF CAKING FUELS IN A GAS PRODUCER WITH INTERNALLY SUSPENDED ROTATABLE DISTILLATION RETORT

Karl Koller, Budapest, Hungary  
Sept. 1, 1925.  
Gr. 4, Cl. 24e

The invention concerns a process for the gasification of caking fuels in a gas producer with internally suspended rotatable distillation retort, which has a circular cross section at the top and a cross section which deviates from the circular shape at the bottom, characterized by the fact that the operation of a gas producer, in which the generator gas passes through the distillation retort, is governed by temperature control in such fashion that the caking zone keeps itself at the marginal surface between the rotating distillation retort and the fuel column, which is kept in rotation by the distillation retort, and which rests in the gas producer.

Germany 479,031  
GAS PRODUCER WITH DISTILLATION CHAMBERS WHICH CAN BE HEATED INTERNALLY AND EXTERNALLY

Nicola Lengensdorff, Bunzlau, Germany  
Feb. 21, 1926.  
Gr. 4, Cl. 24e

The invention concerns a gas producer with distillation chambers which can be internally and externally heated, characterized by the fact that the distillation chamber is placed on top of the gas producer as a coaxial shaft, is composed of fireproof material in the underneath part, and has adjustable connections between the gas producer shaft and the outer annular space of the distillation chamber.

Germany 479,032  
GAS PRODUCER WITH FIRING AT TOP FOR THE PRODUCTION OF STABLE GASES

Nicola Lengensdorff, Bunzlau, Germany  
Nov. 11, 1924.  
Gr. 5, Cl. 24e

The invention concerns a gas producer with firing at the top for the production of stable gases, characterized by an upper distillation shaft and two annular hot-air ducts for the distillation shaft and the upper fire, from which individual adjustable air-inlet pipes empty into the shaft.

Germany 479,431  
PROCESS FOR THE GASIFICATION OF PULVERIZED FUELS CONTAINING CARBON

Rudolf von Dadelsen, Essen, Germany  
Aug. 3, 1924.  
Gr. 3, Cl. 24e

The invention concerns a process for the gasification of pulverized fuels containing carbon, in which a part of the fuel is burned to carbon dioxide and the other part is passed in the opposite direction from the gas flow thus created, in order to reduce the carbon dioxide to carbon monoxide, characterized by the fact that the reduction fuel, before mixture with the stream of gas, is passed in countercurrent to the latter and withdraws heat from it until it comes together with it in a temperature zone of over 1,300° absolute temperature, and assumes its flow direction, whereupon the reduction of the carbon dioxide contained in the gas stream takes place with an absolute temperature of not less than 1,300°, and then, through the heavy withdrawal of heat,

the chemical balance is frozen at about 1,300° absolute temperature.

Germany 479,793

**APPARATUS FOR GASIFICATION AND DEGASIFICATION OF COAL DUST IN THE GAS FLOW**

Géza Szikla and Arthur Rozinek, Budapest, Hungary

*Supplement to 452,015, July 10, 1926.*

*Gr. 3, Cl. 24e*

The invention concerns apparatus for the carrying out of the process described in the first claim of Patent 452,015, characterized by the fact that the angle which is enclosed by the floor of the gasification chamber with the horizontal plane, is smaller than the angle of repose of the descending red-hot dust, so that the descending dust piles up on the floor of the chamber and forms a crater which encloses the air flame.

Germany 480,489

**PROCESS AND APPARATUS FOR THE PRODUCTION OF WATER GAS**

Richard Nübling, Stuttgart-Gaisburg, and Robert Mezger, Stuttgart, Germany

*Nov. 11, 1926.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of water gas with production of water gas in alternating operation and degasification through washing with the water gas produced, characterized by the fact that the fuel in the degasification shaft is cut off by a rotating drum which, while breaking up the coke into smaller pieces, will only convey as much of the latter toward the gasification chamber as will leave a free passageway between the two charges of fuel for the gases.

Germany 481,174

**APPARATUS FOR THE GASIFICATION OF COKE, COAL, OR OTHER CARBONACEOUS MATERIAL IN A PULVERIZED CONDITION**

Paul Dvorkovitz, North Kensington, United Kingdom

*Aug. 21, 1924*

*Gr. 1, Cl. 24e*

The invention concerns an apparatus for the gasification of coke, coal, or other carbonaceous material in a pulverized condition in a gas producer with water vapor, with superheating of the latter in heat accumulators heated in alternating operation, characterized by the fact that a deviating device is arranged laterally under the outlet of the fuel hopper and across from the steam inlet, in order that fuel and steam shall become thoroughly mixed by means of deviation and pulverization.

Germany 483,594

**PROCESS FOR THE PRODUCTION OF A MIXTURE OF WATER GAS AND DISTILLATION GAS FROM BITUMINOUS FUELS**

Otto Misch, Frankfurt am Main, Germany

*Oct. 25, 1925*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of a mixture of water gas and distillation gas with a calorific value of from 3,500 to 4,500 calories per cubic meter from bituminous fuels with the aid of a gas producer to which a shaft is connected for degasification of the fuel, the said degasification shaft being heated with short, hot flames, characterized by the fact that water gas is blown in continuously at the lower part of the degasification shaft and at the same time air or a mixture of steam and air is continuously injected into the lower part of the gasification shaft, in order to obtain water gas enriched with distillation gas as well as

generator gas, for the heating of the degasification shaft.

Germany 484,003

**PROCESS FOR THE PRODUCTION OF GASES**

I. G. Farbenindustrie A.G., Frankfurt am Main, Fritz Winkler, Ludwigshafen am Rhine, Germany

*Supplement to 437,970, Oct. 31, 1924*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas according to Patent 437,970, characterized by the fact that the fuel in the agitated, incandescent generator charge is introduced from below or laterally.

Germany 484,684

**GAS PRODUCER FOR THE GASIFICATION OF BITUMINOUS FUELS BY MEANS OF ALTERNATING HOT BLOWING AND STEAM**

Vertriebsgesellschaft für Doppelgasgeneratoren G.m.b.H., Stassfurt-Leopoldshall, Germany

*Sept. 27, 1924*

*Gr. 2, Cl. 24e*

The invention concerns a gas producer for the gasification of bituminous fuels by means of alternating hot blowing and steam with a steam boiler enclosing the degasification retort, characterized by the fact that a firetube boiler suitable for the production of high-pressure steam encloses the retort in such fashion that an annular space remains open, so that the boiler wall of the annular space and the firetubes together form the heating surface for the production of steam.

Germany 486,557

**WATER-GAS SYSTEM WITH SELF-ACTING THROTTLING OF THE STEAM INLET**

Bamag-Meguinn A. G., Berlin, Germany

*Nov. 4, 1926.*

*Gr. 1, Cl. 24e*

The invention concerns a water-gas system with self-acting throttling of the steam inlet with connection of a steam accumulator between the steam producer and/or the exhaust steam source and the water-gas producer, characterized by the fact that in the high-pressure storage device adjoining each steam producer, in connection with a low-pressure storage storage device, and the said high-pressure storage device being for the utilization of a quantity of exhaust steam, which is itself insufficient, at each discharge period corresponding to a gas period. First the steam is removed until the pressure thereof is the same as that of the steam contained in the low-pressure storage device, from which time onward, the steam of both storage devices is removed in parallel until the end of the gasification period.

Germany 487,886

**PROCESS FOR THE PRODUCTION OF WATER GAS AND OTHER FUEL GASES FROM GRANULAR FUEL**

I. G. Farbenindustrie, Frankfurt am Main, Germany

*Nov. 7, 1926.*

*Gr. 1, Cl. 24*

The invention concerns a process for the production of water gas and other fuel gases from granular fuels, characterized by the constant production of generator gas with gasification occurring partially with continued agitation of the fuel by means of the gasification medium, if necessary with the addition of pulverized fuel, drying and preheating of the fuel arriving for utilization by means of introducing the said fuel into the departing hot generator gas, and complete

gasification of the incandescent residue of the first gasification period in a gas producer by means of introduction of the gasification medium in such fashion that the gasification material is set in an up-and-down whirling motion.

Germany 488,252

**PROCESS AND APPARATUS FOR THE PRODUCTION OF WATER GAS IN ALTERNATING OPERATION**

Paul Grossmann, Bremen, Germany

*Jan. 17, 1926.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of water gas in alternating operation with heating of the distillation and drying zones by means of the blowing gases from outside, and from inside, by means of the water gas, characterized by the fact that the water gas is passed through the distillation shaft in cross-currents and is passed off together with the distillation gases.

Germany 490,782

**SHAFT-SHAPED VESSEL FOR PRODUCTION OF WATER GAS BY CONDUCTING STEAM WITH INCANDESCENT COKE MOVING COUNTER-CURRENT TO THE STEAM**

C. Otto & Co. G.m.b.H., Bochum, Germany

*Dec. 16, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns an arrangement composed of a shaft-shaped vessel for water-gas production by contacting steam with incandescent coke moving counter-current to the steam whereby the coke-charging opening at the upper end of the vessel and the gas offtake can be alternately opened or closed characterized by the fact that at a distance below the gas offtake a second offtake is arranged which opens and closes simultaneously with the coke-charging opening.

Germany 492,088

**PROCESS AND ARRANGEMENT FOR THE PRODUCTION OF GAS FROM SOLID FUELS WITH INJECTION OF OXYGEN AND STEAM AS GASIFICATION MEDIA**

Société de Construction d'Appareils pour Gaz à l'Eau & Gaz Industriels, Paris, France

*Feb. 23, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of gas from solid fuels with injection of oxygen and steam as gasification media with alternating direction of flow of these media, characterized by the fact that during gasification oxygen and steam are injected in one direction in a quantity which develops a greater quantity of heat than is required for the decomposition of the steam, whereas the gasification which follows in the other direction, on the other hand, is only injected with steam, whereby the heat necessary for the decomposition of the steam is recovered from the surplus heat of the previous gasification.

Germany 492,277

**PROCESS FOR THE UTILIZATION OF THE HEAT OF THE GASES IN THE ALTERNATING OPERATION OF WATER GAS AND/OR HYDROCARBON GAS PRODUCERS**

Richard Nübling, Stuttgart-Gaisburg, and Robert Mezger, Stuttgart, Germany

*Nov. 11, 1926.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the utilization of the heat of the gases in the alternating operation of water gas and/or hydrocarbon gas producers in steam-producer heat accumulators with superheater

and waste-heat steam boilers, characterized by the fact that the blowing gas flows through the superheater, wholly or partially through the steam-producer heat accumulators and then through the waste-heat steam boiler, whereas the useful gas only flows through the latter.

Germany 493,675

**PROCESS FOR THE OBTAINING OF WATER GAS**

Theodor Lichtenberger and Ludwig Kaiser, Heilbronn am Neckar, Germany

*Feb. 15, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the obtaining of water gas whereby carbon and steam are brought to react in a molten bath, characterized by the fact that the reaction is carried out in a salt molten bath, and that the steam is introduced to the molten bath in a superheated condition.

Germany 494,240

**PROCESS FOR THE PRODUCTION OF FUEL GASES**

I. G. Farbenindustrie A. G., Frankfurt am Main. Fritz Winkler and Edward Linckh, Ludwigshafen am Rhine, Germany

*Supplement to 437,970. Jan. 25, 1927*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of fuel gases according to patent 437,970, characterized by the fact that the gasification media are introduced through one or a few large openings in the gas producer at such a velocity that the slag melts and can be discharged in liquid form.

Germany 494,532

**PROCESS FOR THE CONTINUOUS PRODUCTION OF WATER GAS FROM A MOIST FUEL**

Julius Pintsch A. G., Berlin, Germany

*Oct. 27, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the continuous production of water gas from moist fuel, whereby the heat is conducted to the water-gas process through the recovery of circulating gas, characterized by the fact that for purposes of drying and distillation of the fuel, the fuel is introduced into one or several—for example, into two—hot flows of gas coming from the water-gas producer, and the gas as well as the fuel, after drying in cyclones connected to the flow of gas, are separated again and the streams of gas are conducted, in part as circulating gas, to the water-gas producer with utilization of their steam content.

Germany 494,836

**PROCESS AND ARRANGEMENT FOR THE HOT CARBURETION OF GASES**

Julius Pintsch A. G., Berlin, Germany

*Oct. 2, 1927.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the hot carburetion of gases, whereby the heat needed for gasification is made available to the carburetion medium by means of the very gas to be carbureted, characterized by the fact that the carburetion process is completely separated from the heat-introduction process, in such fashion that the oil is first conducted to the heated gas at surfaces which served to convey heat, without, therefore, itself contacting these surfaces.

Germany 495,203

**ARRANGEMENT FOR THE UTILIZATION OF THE STORED-UP HEAT OF THE HOT GAS IN A WATER-GAS PRODUCER WITH A DEGASIFICATION RETORT HEATED EXTERNALLY**

Otto Misch, Frankfurt am Main, Germany

*May 1, 1927*  
*Gr. 2, Cl. 24e*

The invention concerns an arrangement for utilizing the stored-up heat of the hot gas in a water-gas producer with a degasification retort which is connected [to the producer] and externally heated by means of water-gas pressure air burners, characterized by the fact that the heating jacketing which is over the upper part of the retort, the said upper part being built so as to form a gas-collection chamber, is extended outward to the outer wall of the charge hopper.

Germany 495,371

**STEAM SUPERHEATER ARRANGEMENT FOR WATER-GAS SYSTEMS**

Bamaq-Meguain A. G., Berlin, Germany

*Dec. 1, 1927*  
*Gr. 1, Cl. 24e*

The invention concerns a steam superheater arrangement for water-gas systems, characterized by the fact that the system of pipes serving to superheat the steam is built into the enclosing brickwork of the combustion chamber inserted between the generator and the waste-heat boiler in such fashion that the inter-mediating heat of the blowing gases stored up by the brickwork is continuously and uniformly released to the system of pipes.

Germany 495,372

**PROCESS FOR THE HOT BLOWING OF WATER GAS AND DOUBLE GAS GENERATORS**

Werschen-Weissenfelser Braunkohlen A. G., Halle, Germany

*Sept. 24, 1927*  
*Gr. 1, Cl. 24e*

The invention concerns a process for the hot blowing of water gas and double gas generators, characterized by the fact that the blowing air is diluted by means of hot unburned or burned blowing waste gases.

Germany 496,342

**PROCESS FOR THE PRODUCTION OF WATER GAS IN A BED OF FINE-GRANULAR FUEL, WITH TURBULATION OF THE GASIFICATION MATERIAL**

I. G. Farbenindustrie A. G., Frankfurt am Main. Fritz Winkler, Edward Link, Ludwigshafen am Rhine, and Carl Messerknecht, Neurössen, Germany

*Supplement to 437,970. Mar. 9, 1926*  
*Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas in a bed of fine-granular fuel with turbulation of the gasification material in accordance with Patent 437,970, characterized by the fact that during water-gas blowing, fresh, suitable fuel is introduced into the incandescent fuel bed.

Germany 496,343

**GAS PRODUCERS FOR THE PRODUCTION OF FUEL GASES FROM GRANULAR, UNDER CERTAIN CIRCUMSTANCES PULVERIZED FUELS**

I. G. Farbenindustrie A. G., Frankfurt am Main. Fritz Winkler, Ludwigshafen am Rhine, Germany

*Supplement to 437,970. Feb. 10, 1928.*  
*Gr. 1, Cl. 24e*

The invention concerns a gas producer for the production of fuel gases from granular, in some circum-

stances pulverized fuels, in a fuel-bed kept in up-and-down motion according to Patent 437,970, characterized by the fact that it is provided with an expanded post-gasification chamber for the post-gasification of coal dust by means of added gasification media.

Germany 497,739

**PROCESS AND APPARATUS FOR THE DEGASIFICATION AND GASIFICATION OF FUELS IN ONE OPERATION BY MEANS OF HEATING THROUGH THE RADIANT HEAT OF A MOLTEN BATH**

Theodor Lichtenberger, Stuttgart, Germany

*Apr. 8, 1928.*  
*Gr. 1, Cl. 24e*

The invention concerns a process for the degasification and gasification of fuels in one operation by means of heating through the radiant heat of a molten bath, characterized by the fact that the fuel in the gas producer is exposed to a gradually descending column of radiant heat from a salt bath, the said column descending gradually in the gas producer.

Germany 497,894

**PROCESS FOR THE PRODUCTION OF WATER GAS AND OTHER FUEL GASES**

I. G. Farbenindustrie A. G., Frankfurt am Main. Fritz Winkler, Ludwigshafen am Rhine, and Carl Messerknecht, Neurössen, Germany

*Supplement to 437,970. Aug. 5, 1926.*  
*Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas and other fuel gases in a bed of fine-granular fuel in accordance with Patent 437,970, characterized by the fact that moist fuel is introduced along with the hot gases leaving the gas producer in such fashion that the said fuel is swept along as far as an extractor and is thereby dried, whereupon the dried fuel is passed from the extractor directly through a conveyor pipe to the fuel bed of the gas producer.

Germany 498,225

**PROCESS FOR THE PRODUCTION OF GASES**

I. G. Farbenindustrie, Frankfurt am Main. Fritz Winkler, Eduard Linckh, and Paul Feiler, Ludwigshafen am Rhein, Germany

*Nov. 16, 1926.*  
*Gr. 1, Cl. 24e*

The invention concerns a process for the production of gases according to Patent 437,970, characterized by the fact that for purposes of obtaining uniform motion of a high charge of coal in the gas producers, agitating gases, such as air, steam, generator gases, etc., are injected in addition to the air, etc. introduced into this coal charge below the coal bed.

Germany 499,305

**PROCESS FOR THE CONTINUOUS PRODUCTION OF WATER GAS**

Gas und Teer G.m.b.H., Berlin, Germany

*Jan. 30, 1924.*  
*Gr. 1, Cl. 24e*

The invention concerns a process for the continuous production of water gas by means of a flow of gas circulating between the gas producer and a recovery apparatus, of which a partial flow is branched off for heating of the recovery apparatus, characterized by the fact that this branching off takes place before the circulating current enters into the gas producer.

Germany 499,673

**GAS PRODUCER FOR CARBURETED WATER GAS FROM COKE WITH INJECTION OF A MIXTURE OF STEAM AND OIL VAPOR INTO THE FUEL COLUMN**

Frankfurter Gasgesellschaft and Ernst Schumacher, Frankfurt am Main, Germany

*Supplement to 479,029. Apr. 15, 1927.  
Gr. 2, Cl. 24e*

The invention concerns a gas producer for carbureted water gas from coke with injection of a mixture of steam and oil vapor into the fuel column in accordance with Patent 479,029, characterized by the fact that during hot blowing, the upper part of the lower shaft has additional air entering it for the combustion of the blowing gases.

Germany 500,281

**PROCESS FOR THE PRODUCTION OF GAS FROM BITUMINOUS FUELS WITH A MIXTURE OF OXYGEN AND STEAM**

Rudolf Drawe, Berlin-Charlottenburg, Germany

*May 23, 1926.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of a gas with high calorific value from bituminous fuels with use of a mixture of oxygen and steam for the gasification, characterized by the fact that the volatile components are driven out in a preconnected gasification shaft by means of partial gasification of the stable carbon with a mixture of oxygen and steam, and the said volatile components are released separately, whereas the remainder of the solid fuel in an incandescent state is used in a known type apparatus connected after [the above described apparatus].

Germany 500,282

**PROCESS FOR THE COMPLETE GASIFICATION OF COAL AND SIMILAR TAR-YIELDING FUELS IN A WATER-GAS PRODUCER**

Humphreys &amp; Glasgow, Ltd., Westminster, United Kingdom

*June 4, 1925. Patent applied for in Great Britain  
June 4 and Nov. 3, 1924.  
Gr. 2, Cl. 24e*

The invention concerns a process for the complete gasification of coal and similar tar-yielding fuels in a water-gas producer, with alternating hot blowing and gasification and internal heating of the degasification chamber, characterized by the fact that the heating of the degasification chamber takes place both by means of the flowing through of the water gas in the ascending gasification, as well as by means of the flowing through of steam in the next-ensuing descending gasification, under certain conditions mixed with reverse-flowing water gas, whereby the combustion heat of the blowing gases is charged into the steam and/or the reverse-flowing water gas, as the case may be, in regenerators, the said combustion heat being extracted under the degasification chamber and burned in the regenerators.

Germany 500,894

**WATER-GAS PRODUCER WITH A SHAFT SERVING FOR THE CONSTANT PRODUCTION OF WATER GAS, AND HEATED FROM OUTSIDE**

Otto Misch, Frankfurt am Main, Germany

*Jan. 7, 1928.  
Gr. 1, Cl. 24e*

The invention concerns a water-gas producer with continuous production by means of an externally heated retortlike shaft, characterized by the fact that the retort shaft is converted in the lower part into a gasification shaft serving for the production of generator gas, the gas offtake pipe of which is connected with the heating apparatus of the retort shaft.

Germany 501,234

**GAS GENERATOR WITH PRE-DISTILLATION ARRANGEMENT**

Wilhelm Müller, Gleiwitz, Germany

*Apr. 25, 1926.  
Gr. 4, Cl. 24e*

The invention concerns a gas generator with a pre-distillation arrangement, characterized by the fact that the distillation chamber is supported on a carrying ring which is hollow and depends by pipe pieces from the upper cover plate, the said carrying ring being itself connected to a likewise hollow supporting plate by means of short crosspipes, and by the fact that the distillation chamber is protected in the upper part of the generator by a curved fireproof jacketing.

Germany 501,378

**PROCESS FOR THE GASIFICATION OF BITUMINOUS COAL**

Fritz Hofmann, Myron Heyn, Wolfgang Grote, and Manfred Dunkel, Breslau, Germany

*Nov. 21, 1924.  
Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of bituminous coal, characterized by the fact that bituminous coal in briquetted form is directly conveyed into the gas producer without any agglutinant, at a high temperature in the presence of the distillation gas, in other words, while still hot.

Germany 503,164

**PROCESS FOR THE PRODUCTION OF CARBON MONOXIDE GAS**

Frans Martin Wiberg, Falun, Sweden

*Jan. 29, 1927. Application filed in Sweden Feb. 27, 1926.  
Cl. 24e, Gr. 3*

The invention concerns a process for the production of carbon monoxide gas by means of the reduction of the carbon dioxide in gases containing CO<sub>2</sub> to carbon monoxide by means of coal and/or coke, as the case may be, heated by means of hot blowing in the electrically heated generator, for the reduction of ores or ore-like oxygen compounds, characterized by the fact that a part of the heat required to bring about the reduction is produced by the fact that air or oxygen is used alternately with the carbon-dioxide-containing gas for hot blowing of the occasionally cold generator, whereas the carbon-dioxide-containing gas to be reduced is passed thru the occasionally hot generator with partial reduction of the CO<sub>2</sub> present to carbon monoxide, whereupon the remaining reduction of the CO<sub>2</sub> contained is brought about by the fact that the gas is passed through a generator (containing) electrically heated coal and/or coke as the case may be.

Germany 503,410

**PROCESS FOR THE REGULATION OF TEMPERATURE IN THE HEATING OF RECOVERY CHAMBERS FOR THE HEATING OF A MIXTURE OF GAS AND STEAM FOR CONTINUOUS WATER-GAS PRODUCTION**

Julius Pintsch A.G., Berlin. Herman Hillebrand, Berlin-Friedrichshagen, Germany

*Aug. 30, 1928.  
Gr. 1, Cl. 24e*

The invention concerns a process for the regulation of the temperature development in the heating of recovery chambers for the heating of a mixture of gas and steam for continuous water-gas production, whereby a partial flow serves as a heating medium, the said partial flow being a branched-off flow from the heated flow of gas and steam between the regenerator and the reaction chamber, characterized by the fact that

the heating temperature is influenced by the addition of steam or a mixture of steam and waste gas, or another addition to the heating medium or to the combustion air, or to both.

Germany 503,748

RUNOFF GENERATOR WITH A SYSTEM OF PIPES FOR GASIFICATION OF BITUMINOUS FUELS, ESPECIALLY BITUMINOUS COAL OR LIGNITE

Albert Luedtke, Essen, Germany

Sept. 16, 1926.

Gr. 3, Cl. 24e

The invention concerns a runoff generator with a system of pipes for the gasification of bituminous fuels, especially bituminous coal or lignite, characterized by the fact that in the known manner in the case of gas producers with dry ash removal, a system of pipes is installed in the [gasification] shaft somewhat beneath the upper surface of the fuel column, and that the said system of pipes is horizontally peripheral and is more or less supplementarily charged, depending on the type and behavior of the fuel.

Germany 503,975

PROCESS FOR THE PRODUCTION OF WATER GAS AND GENERATOR GAS IN A BED OF FINE-GRANULAR FUELS

I. G. Farbenindustrie A.G., Frankfurt am Main, Germany.

Fritz Winkler, Ludwigshafen am Rhein, Germany

Supplement to 437,970. Apr. 3, 1927.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas and generator gas in a bed of fine granular fuel in accordance with Patent 437,970, characterized by the fact that the gasification media, which keep the granular coal in a whirling, up-and-down motion, are introduced to the gas producer.

Germany 506,572

GAS PRODUCER WITH DISTILLATION SHAFT FOR BITUMINOUS FUELS

Julius Pintsch A.G., Berlin, Germany

Jan. 12, 1928.

Gr. 4, Cl. 24e

The invention concerns a gas producer with distillation shaft for bituminous fuels, characterized by the fact that the fuel column of the distillation shaft is carried by a gas-permeable traveling grate, which throws the degasified fuel off into a receiving hopper for the gasification shaft, the said receiving hopper acting as a special intermediate shaft separating the fuel shaft from the gasification shaft.

Germany 506,865

PROCESS FOR THE PRODUCTION OF WATER GAS FROM COAL

Humphreys & Glasgow, Ltd., Westminster, United Kingdom

Nov. 7, 1925. Application filed in Great Britain

Dec. 16, 1924.

Gr. 2, Cl. 24e

Process for the manufacture of water gas by carbonizing coal with upwards flowing water gas and unreacted steam which are obtained by contacting coke with steam previously superheated in heat-storing chambers with or without addition of already formed water gas characterized by the fact that a gasifying period is added using steam which has not passed through heat-storing chambers whereby the produced gas flows upwards through the coal and then through the heat-storing chambers to obtain carburetted water gas.

Germany 508,815

GAS PRODUCER SYSTEM FOR THE OBTAINING OF CARBURETTED WATER GAS FROM COAL

Sydney James Brittiffe Tully and Oliver Evan Yeo, Newark-on-Trent, United Kingdom

Dec. 6, 1927.

Gr. 2, Cl. 24e

The invention concerns a gas-produced system in which, for the purpose of simultaneous production of carburetted water gas, of varying calorific values, a coal retort with a special outlet directly above a gas generator and connected with the latter is arranged and provided with an external heating chamber which is connected with a gas producer and a carburetion chamber charged with atomized carburetion oil, characterized by the fact that the carburetion chamber is constructed so as to be integral with the retort, the gas producer, and the heating chamber and, within this construction solidarity, is directly connected with the upper end of the heating chamber by means of a short passage at the upper end of the said carburetion chamber.

Germany 510,351

DEGASIFICATION CHAMBER FOR GAS PRODUCERS WITH AN OBLONG CROSS SECTION OF THEIR SHAFT

Carl Bleyer, Leipzig, Germany

Feb. 8, 1927.

Gr. 2, Cl. 24e

The invention concerns a degasification chamber for gas producers with an oblong cross-section of the shaft, characterized by the fact that the said chamber, with its unheated frontal walls which are perforated by poke holes, forms the outer wall of the degasification chamber, whereas on its two longitudinal sides, in addition to the heating ducts, equipment for waste heat recovery is provided including steam boilers and superheaters.

Germany 511,658

GAS PRODUCER FOR PULVERIZED FUELS

Albert Ledebur, Herzogenrath, Germany

Supplement to 477,581. Feb. 27, 1929.

Gr. 3, Cl. 24e

The invention concerns a gas producer for pulverized fuels with several combustion and gasification chambers built beneath each other and interconnected, in accordance with Patent 477,581, characterized by the fact that the connecting ducts of the chambers are built beneath each other in the descending direction of the fuel, and the chambers themselves are located against [or toward] each other in such fashion that at the transition points, the flow of the gases and the gasification medium undergo a reversal of direction so that it is forced to traverse the descending fuel layer once more in order to bring about a complete gasification of all the parts of the fuel.

Germany 512,654

GAS PRODUCER AND PROCESS FOR ITS OPERATION

Zahn & Co. G.m.b.H., Berlin, Germany

Dec. 19, 1928.

Gr. 3, Cl. 24e

The invention concerns a gas producer with upward directed passages, in which the necessary air for gasification is introduced through several tuyères which project into the fuel and which are adjustable as required by means of their mutual distance from each other, and in which the coal, which is charged from above, fills the entire area surrounded by brickwork, characterized by the fact that around the periphery of the gas producer, two or more rows of tuyères disposed at varying heights are provided, and two or more rows



of gas outlets are also provided, which, set into operation according to need, make possible the exact maintaining of varying charge heights which are most suitable at any given time.

Germany 514,194

**PROCESS FOR THE GASIFICATION OF FUELS WITH STEAM AND AIR OR MORE OR LESS PURE OXYGEN**

Mathias Fränkl, Augsburg, Germany

*Dec. 3, 1929.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of fuels with steam and air or more less pure oxygen in two shafts which are connected with each other below and which together comprise a gas generator, characterized by the fact that the steam is introduced through the top of one of the two generators in alternation and the gas produced departs through the top of the other, while air or pure oxygen or air for the most part free of nitrogen is introduced continuously or intermittently from below.

Germany 514,486

**PROCESS AND APPARATUS FOR THE TWO-STAGE GASIFICATION OF BITUMINOUS FUELS IN DUST FORM**

Karl Meitzler, Braunschweig, Germany

*Sept. 4, 1925.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the two-stage gasification of bituminous pulverized fuels, characterized by the fact that the coke breeze received by pre-gasification and which is heated as it is moved along by means of external heating is constantly conveyed toward a gasifier through a conveyor device which simultaneously serves as a gas cutoff, in which gasifier it is converted to water gas with the admixture of superheated steam in countercurrent.

Germany 516,655

**PROCESS FOR THE PRODUCTION OF WATER GAS IN A FUEL COLUMN PLACED IN AN UP-AND-DOWN WHIRLING MOTION**

I. G. Farbenindustrie A. G., Frankfurt am Main. Fritz Winkler and Paul Feiler, Ludwigshafen am Rhine, Germany

*Supplement to 437,970. Nov. 28, 1926. (Earlier supplementary patents: 438,843; 443,445; 446,678.)*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas in a fuel column which, in accordance with Patent 437,970, is placed through the pressure of the gasification medium in an up-and-down whirling motion throughout its entire height, characterized by the fact that hot gases, such as combustion gases, smoke gases, generator gases, and the like, are used for the hot blowing.

Germany 516,786

**PROCESS FOR THE PRODUCTION OF WATER GAS FROM COAL DUST AND STEAM**

Gas und Teer G.m.b.H., Berlin. Hermann Hillebrand, Berlin-Friedrichshagen, Germany

*Aug. 25, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas from coal dust and steam with introduction of heated water gas as a heat conveyor in a gasification chamber, characterized by the additional introduction of highly heated water gas serving as a heat conveyor when the gas, steam, and coal dust mixture flows through the gasification chamber.

Germany 517,469

**PROCESS FOR THE CONTINUOUS PRODUCTION OF WATER GAS FROM GRANULAR FUELS OR, UNDER CERTAIN CIRCUMSTANCES, FUELS CONTAINING DUST**

I. G. Farbenindustrie A. G., Frankfurt am Main, Germany

*Supplement to 437,970. Feb. 22, 1928. The principal patent began on Sept. 28, 1922.*

*Gr. 1, Cl. 24e*

The invention concerns a process in accordance with Patent 437,970 for the continuous production of water gas out of granular fuels or, under certain circumstances, fuels containing dust, characterized by the fact that the heat needed for the production of water gas is introduced by means of specially heated heating bodies, with the simultaneous use of superheated steam for the production of the gas.

Germany 518,173

**GAS PRODUCER FOR PULVERIZED AND GRANULAR FUELS**

I. G. Farbenindustrie A.G., Frankfurt am Main. Adolf Traut, Ludwigshafen am Rhein, Germany

*Feb. 8, 1925.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer for pulverized and granular fuels with a cylindrical chamber which is narrow in comparison to its diameter, with a horizontal axis, whereby the introduction of fuel and gasification media takes place at several points in the periphery of the chamber, either separately or jointly tangential and similarly directed, and the finished gas, together with the ash residue is laterally removed at the center of the frontal wall, characterized by the fact that the gasification media are only introduced at the lower half of the gasification chamber, in a suitable manner through several tuyères and separately from the fuel.

Germany 518,427

**ARRANGEMENT FOR THE PRODUCTION OF WATER GAS FROM PULVERIZED FUELS**

Harald Nielsen and Bryon Laing, London, United Kingdom

*May 31, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns an arrangement for the production of water gas from pulverized fuels, in which gasification occurs in a reaction chamber which is alternately hot-blown through the combustion of fuel and which serves as a heat accumulator, characterized by the fact that the reaction chamber, which lies over the combustion chamber, is provided with outwardly directed channels which flow through the checkerwork of the masonry in such an undulating fashion that the fuel in the reaction chamber which is not gasified is able to descend once more to the lower part of the [gasification] shaft.

Germany 520,171

**GAS PRODUCER**

I. G. Farbenindustrie A.G., Frankfurt am Main. Adolf Traut, Ludwigshafen am Rhein, Germany

*Supplement to 518,173. May 8, 1927.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer in accordance with Patent 518,173, characterized by the fact that an approximately horizontally placed pipe, suitably supplied with inlet openings for the introduction of additional gases or gasification media, connects to the outlet opening of the chamber, the diameter of which pipe is appropriately smaller than that of the gas producer chamber.

Germany 520,739

## ARRANGEMENT FOR THE PRODUCTION OF WATER GAS AND HYDROCARBON GAS FROM SMALL GRANULAR OR PULVERIZED FUEL

Bamag-Meguain A.G., Berlin and Oswald Heller, Berlin-Wilmersdorf, Germany

*Dec. 21, 1927.  
Gr. 1, Cl. 24e*

The invention concerns an arrangement for the production of water gas and hydrogen gas from small granular or pulverized fuel, in which the gasification takes place in an alternately hot-blown regenerating heat accumulator, characterized by the fact that the inner space of the gas producer is divided into two chambers of unlike size by means of an intervening wall, the said chambers being traversed by vertical ducts, the smaller chamber of which serves as a superheater during gas production, and the larger chamber as a reaction space, and both chambers, during gasification, are traversed in the reverse direction than that which occurs in hot blowing.

Germany 524,971

## PROCESS FOR THE GASIFICATION OF FINE GRANULAR OR PULVERIZED FUELS

C. Otto &amp; Co. G.m.b.H., Bochum, Germany

*Oct. 9, 1927.  
Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of fine granular or pulverized fuels, in which a pulsating gasification media are passed to the gas producer, characterized by the fact that the pressure under which the gasification media are introduced is so high during the period of higher pressure that the upper part of the quiescent fuel bed is loosened and, in the period of less pressure is so low, that a settling of the loosened fuel takes place, with a corresponding adjustment of the duration of both periods.

Germany 525,220  
GAS PRODUCERHumphreys & Glasgow, Ltd., Westminster, United Kingdom  
*Dec. 14, 1929; published May 23, 1931. Application filed in the U.S.A. Jan. 21, 1929.**Gr. 4, Cl. 24e*

The invention concerns a gas producer in which the upper part of the fuel bed is subdivided by means of plates, characterized by the fact that both on the outer side of the plates, between the plates and the wall of the gas producer, and on their inner side, between adjacent plates, a sufficiently large intervening space remains to enable the gases to pass laterally between the plates.

Germany 528,880

## WATER-GAS PRODUCER WITH EXTERNALLY HEATED GASIFICATION CHAMBER

Otto Misch, Berlin-Tempelhof, Germany  
*Supplement to 500,894. Oct. 11, 1928.**Gr. 1, Cl. 24e*

The invention concerns a water-gas producer with externally heated gasification chamber which is provided with continuous injection of superheated steam in accordance with Patent 500,894, characterized by the fact that the steam which flows continuously into the gasification chamber is superheated close to that of the inner temperature of the gasification chamber.

Germany 529,246

## PROCESS FOR THE DEGASIFICATION AND GASIFICATION OF FUELS IN ONE OPERATION THROUGH HEATING BY THE RADIANT HEAT OF A MOLTEN BATH

Theodor Lichtenberger, Stuttgart, Germany

*Supplement to Patent 497,739. Aug. 16, 1930.  
Gr. 1, Cl. 24e*

The invention concerns a process for the degasification and gasification of fuels in one operation through heating by the radiant heat of a molten bath in accordance with Patent 497,739, characterized by the fact that the steam required for gasification is injected over the salt bath or through the salt bath into the gas producer.

Germany 530,064

## PROCESS AND APPARATUS FOR THE GASIFICATION OF PULVERIZED FUELS IN EXTERNALLY HEATED CHAMBERS

Franz Herzberg, Leisnig, Germany

*Dec. 7, 1926.  
Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of pulverized fuels which are gasified in closed, externally heated chambers, the said fuels descending under the influence of gravity through steam, characterized by the fact that chambers with large areas and such dimensions are used that, with the known type of heating through heat ducts, the dust is completely gasified in suspended distillation condition with the formation of a mixed gas of medium calorific value.

Germany 531,208

## PROCESS AND GAS PRODUCER FOR THE PRODUCTION OF WATER GAS FROM PULVERIZED FUEL

Max Heller, Berlin-Charlottenburg, Germany

*Apr. 3, 1928.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas from pulverized fuel brought into a decomposition chamber, characterized by the fact that the fuel dust and the steam are blown into the decomposition chamber in such fashion that they circulate in this chamber, whereby the chamber is externally heated.

Germany 531,634

## PROCESS AND ARRANGEMENT FOR THE UTILIZATION OF THE HEAT OF THE WASTE GASES IN ALTERNATELY OPERATING GAS GENERATORS

Albert Breisig, Vienna, Austria

*Dec. 1, 1929; application filed in Austria Dec. 3, 1928.  
Gr. 1, Cl. 24e*

The present invention concerns a process for the utilization of the heat of the waste gases in alternately operating gas generators, in which the heat of the waste gases serves for the production of steam, for the superheating of steam, and to operate a waste-heat steam boiler, characterized by the fact that the part of the waste gases, not required for the production and superheating of the steam used in the gas production process, is branched off into a second regenerator before entering the regenerator which serves for the superheating of steam, and is burned in the said second regenerator, which is connected to the waste-heat boiler and is swept over during the gasification period by a supporting gas in a known manner, the said supporting gas conducting the stored heat to the waste-heat boiler.

Germany 531,822

## PROCESS FOR THE CONTINUOUS PRODUCTION OF WATER GAS BY MEANS OF A HIGHLY HEATED MIXTURE OF GAS AND STEAM

Julius Pintsch A.G., Berlin. Hermann Hillebrand, Berlin-Friedrichshagen, Germany

Aug. 20, 1929.

Gr. 1, Cl. 24e

The invention concerns a process for the continuous production of water gas by means of a highly heated mixture of gas and steam introduced into the gas producer, characterized by the fact that the gas-steam mixture injected is divided into a partial flow in the direction of the movement of the coal through the gas producer, and into another one which is opposite thereto and countercurrent to the partial flow moving in the direction of the coal movement.

Germany 533,021

## GAS PRODUCER FOR BITUMINOUS FUELS

Joseph Hudler, Murnau, Germany

Aug. 11, 1927.

Gr. 4, Cl. 24e

The invention concerns a gas producer for bituminous fuels with a gas exhaust outlet below for the gasification gases and an exhaust outlet above the distillation zone for a branched-off part of the gasification gases and the distillation products, characterized by the fact that both gas outlets are formed of openings which empty into annular ducts which are installed all around the [gasification] shaft circumference and surround the inner periphery of the shaft, whereby the upper gas outlet is at a sufficient height distance from the charge opening that, on account of the large reserve chamber of cold coal resulting therefrom, and which is in constant connection with the distillation chamber, the temperature in the distillation zone through fresh charging is not influenced, even after longer pauses, so that even under varying operational conditions uniform temperature conditions are obtained in the distillation zone, and thereby a gas of uniformly high heating value is obtained.

Germany 534,328

## PROCESS FOR THE OPERATION OF SYSTEMS FOR THE CONTINUOUS PRODUCTION OF WATER GAS BY MEANS OF A HEATER AND A FLOW OF GAS CIRCULATING THROUGH THE GASIFIER

Julius Pintsch A. G., Berlin, Germany

Apr. 6, 1928.

Gr. 1, Cl. 24e

The invention concerns a process for the operation of systems for the continuous production of water gas by means of a flow of gas circulating through a heater and a gasifier, whereby the steam necessary for the reaction is contained in the flow of gas already before entry into the heater, characterized by the fact that the sensible heat of the flow of gas after the water gas reaction is used in addition to the newly formed water gas for the distillation of as large an amount of bituminous fuel as is needed for the production of coke.

Germany 534,660

## PROCESS FOR THE CONTINUOUS PRODUCTION OF WATER GAS BY MEANS OF A HEATED BRANCH STREAM OF GAS OF THE WATER GAS PRODUCED

Julius Pintsch A.G., Berlin. Hermann Hillebrand, Berlin-Friedrichshagen, Germany

Aug. 20, 1929.

Gr. 1, Cl. 24e

The invention concerns a process for the continuous production of water gas by means of a heated branch stream of gas of the water gas produced, characterized

by the fact that steam is injected into the ashes descending from the gasifier, which ashes still contain carbon and are heated by a highly heated stream of gas, whereupon the said steam comes together in the gasification chamber with the hot stream of gas.

Germany 535,009

## PROCESS AND ARRANGEMENT FOR THE DEGASIFICATION AND GASIFICATION OF BITUMINOUS FUELS IN ALTERNATELY OPERATING GENERATORS

Albert Breisig, Vienna, Austria

May 16, 1930.

Gr. 2, Cl. 24e

The invention concerns a process for the degasification and gasification of bituminous fuels in alternately operating generators, in which, during the gasification period, the entire water gas is passed through the fuel and, during the blowing period, the distillate which is released by the fuel, thus heated, is obtained in unmixed form, characterized by the fact that the distillates originating during hot blowing in the degasification area of the generator are passed over a supply of fuel appropriately housed in the degasification shaft and drawn from the action of the washing gas used for degasification, and condense the steam-formed hydrocarbons of the distillation gases onto the supply of fuel to bring about cracking during the then-following degasification of the fuel supply with the low-temperature tar originating hereby.

Germany 535,535

## PROCESS AND ARRANGEMENT FOR THE PRODUCTION OF WATER GAS AND OTHER FUEL GASES

I. G. Farbenindustrie A. G., Frankfurt am Main. Fritz Winkler, Ludwigshafen am Rhein, Germany

Supplement to 437,970. Apr. 8, 1928.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas and other fuel gases in a bed of fine-granular fuel with turbulation of the gasification material in accordance with Patent 437,970, characterized by the fact that the gasification media in the [gasification] shaft of the gas producer are preheated above the fuel charge, and are blown from above against the fuel which is in motion.

Germany 535,672

## PROCESS FOR OBTAINING WATER GAS WITHOUT THE PRODUCTION OF GENERATOR GAS

I. G. Farbenindustrie A. G., Frankfurt am Main. Fritz Winkler, Ludwigshafen am Rhein, Germany

Supplement to 437,970. Dec. 12, 1929.

Gr. 1, Cl. 24e

The invention concerns a process for obtaining water gas without producing generator gas, in accordance with Patent 437,970, characterized by the fact that in order to obtain rapid heating of the charge of fuel, in a suitable fashion with fuel not too markedly in motion, as much air as necessary is passed into the combustible-dust-containing hot blowing gas after leaving the fuel bed through upward-channeled conduits, over the fuel bed as uniformly as possible, so that the combustible-dust-containing hot blowing gas is completely burned to carbon dioxide.

Germany 540,316

## PROCESS FOR THE PRODUCTION OF CARBON MONOXIDE AND HYDROGEN THROUGH THE GASIFICATION OF A FUEL

Rudolf Drawe, Berlin-Charlottenburg, Germany

June 14, 1927.

Gr. 1, Cl. 24e

The invention concerns a process for the produc-

tion of carbon monoxide and hydrogen through the gasification of fuel, characterized by the following special features:

In a gas producer which is operated with the use of a highly saturated mixture of steam and oxygen, a gas is produced in a known manner which contains hydrogen and carbon dioxide, and the carbon dioxide removed from this gas is passed to a second gas producer together with oxygen, which producer produces a gas composed almost exclusively of carbon monoxide.

Germany 540,548

**PROCESS FOR THE GASIFICATION OF FUELS WITH A MIXTURE OF STEAM AND OXYGEN OR AIR ENRICHED WITH OXYGEN**

Metallgesellschaft A. G., Frankfurt am Main, Germany

*Jan. 27, 1928.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of fuels with a mixture of steam and oxygen or air enriched with oxygen, characterized by the fact that it is carried out with a rotating pipe with the introduction of enough steam that the gasification temperature is under the slag-fusion temperature.

Germany 541,049

**PROCESS FOR THE GASIFICATION OF FUEL WITH A MIXTURE OF OXYGEN AND STEAM**

Rudolf Drawe, Berlin-Charlottenburg, Germany

*Aug. 15, 1926.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of fuel with a mixture of oxygen and steam, characterized by the fact that the height of the fuel bed in the gasifier is 3 meters or higher.

Germany 541,686

**PROCESS FOR THE PRODUCTION OF WATER GAS AND OTHER FUEL GASES IN A BED OF FINE GRANULAR FUEL**

I. G. Farbenindustrie A.G., Frankfurt am Main. Fritz Winkler, Ludwigshafen am Rhein, Germany

*Supplement to 437,970. Jan. 15, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas and other fuel gases in a bed of fine granular fuel in accordance with Patent 437,970, characterized by the fact that the gasification media, which keeps the fine-granular fuel charge in motion, also blow against the fuel charge at high velocity from above.

Germany 543,001

**SYSTEM FOR THE GASIFICATION OF FUEL DUST WITH A STREAM OF STEAM CIRCULATED IN THE CIRCUIT**

Bamaq-Meguín A. G., Berlin, Germany, and Oswald Heller, Ústí, Czechoslovakia

*Feb. 18, 1928.*

*Gr. 1, Cl. 24e*

The invention concerns a system for the gasification of fuel dust with a stream of steam circulated in the circuit, characterized by the fact that a gas heater made so as to form a heat accumulator is connected with the reaction chamber, in which a mixture composed of a high-pressure primary gas with low volume and of fuel dust, is conveyed together with the highly heated, high-volume circulating gas in a fountainlike manner, while the gas available at the conclusion of the reaction, and the ashes, emerge at the under side of the reaction chamber.

Germany 543,592

**ARRANGEMENT FOR THE GASIFICATION OF PULVERIZED, SOLID, OR ATOMIZED LIQUID FUELS**

Franz Herzberg, Leisnig, Germany

*July 22, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns an arrangement for the gasification of pulverized solid, or atomized liquid fuels, composed of externally heated chambers in which steam superheated in regenerators or recuperators is injected, characterized by the fact that the heat ducts located next to the chambers are built so as to form regenerators or recuperators.

Germany 545,972

**APPARATUS FOR THE CONTINUOUS PRODUCTION OF WATER GAS FROM GRANULAR FUEL**

I. G. Farbenindustrie A.G., Frankfurt am Main. Adolf Traut, Ludwigshafen am Rhein, Germany

*Mar. 26, 1929.*

*Gr. 2, Cl. 24e*

The invention concerns an apparatus for the continuous production of water gas from granular fuels which move downwards in a vertical direction in chambers or vertical pipe heaters externally heated over the enclosing walls, several of which chambers or heaters are advantageously arranged next to each other, characterized by the fact that the fuel-bed is subdivided into several smaller gasification cells on top of each other, which are so connected with each other that they permit the fuel in the one cell which has not yet been gasified to pass to the next cell under it.

Germany 547,555

**GAS PRODUCER WITH REVERSE DRAFT DIRECTION**

Ernst Mahlkuch, Greifenmühle bei Klützwow, Germany

*Dec. 23, 1930.*

*Gr. 5, Cl. 24e*

The invention concerns a gas producer with reverse draft direction for tar-yielding fuels, characterized by the fact that for the purpose of supporting one of the tar-containing gases at a corresponding temperature to that in the incandescent zone, even when operating with different types of fuels and with varying loads, the cross section of the [gasification] shaft in the incandescent zone can be altered—for example, through axial motion of a throttling body located near the narrowest cross section of the shaft.

Germany 549,213

**PROCESS FOR THE GASIFICATION OF SOLID FUELS CONTAINING VOLATILE COMPONENTS**

Wilhelm Kleisser, Berlin, Germany

*Nov. 24, 1925.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the gasification of solid fuels containing volatile components, which are introduced to the producer shaft in layers and are degasified by high-temperature coking at a given time before the subsequent charging of a new layer, characterized by the fact that the introduction of the fuel in layers takes place with the natural angle of slope [of the fuel], and each fuel layer of fuel is heated for rapid degasification by the producer cover which simultaneously serves as a heat accumulator, through radiant heat, whereby the high heating of the producer cover before filling with new fuel can be expedited through introduction of a secondary draft over the uppermost [part of the] fuel bed.

Germany 549,249

## PROCESS FOR THE PRODUCTION OF WATER GAS OR A GAS MIXTURE SIMILAR TO WATER GAS FROM BITUMINOUS COAL OR LIGNITE

Adalbert Szillard, Vienna, Austria

*June 1, 1929. Application filed in Austria**June 11, 1928.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas or a gas mixture similar to water gas from bituminous coal or lignite by means of the complete gasification thereof in a generator, the upper part of which serves for the degasification of the coal which takes place along with the introduction of blowing gases, and the lower part for the further gasification thereof in the water-gas process, characterized by the fact that all the pure water gas produced during the gasification period is drawn out below the degasification zone from the coke column, whereby the degasification of the coal in the upper part of the generator occurs exclusively by means of the conducting there-through of adjustable quantities of the hot blowing gases accruing in the lower part of the generator.

Germany 549,287

## GAS PRODUCER WITH REVERSE COMBUSTION

Ernst Mahlkuch, Greifenmühle bei Klützw, Germany

*Supplement to 547,555. Jan. 21, 1931.**Gr. 5, Cl. 24e*

The invention concerns a gas producer with reverse combustion in accordance with Patent 547,555 for the adduction of air through an annular blast nozzle, characterized by the fact that the cross section of the shaft in the incandescent zone below the annular blast-nozzle—for example through axial movement of a throttling device near the narrowest cross section of the shaft—is altered.

Germany 549,320

## PROCESS AND APPARATUS FOR THE GASIFICATION OF PULVERIZED, SOLID, OR ATOMIZED LIQUID FUELS

Franz Herzberg, Leisnig, Germany

*Supplement to 541,158. July 21, 1928.**Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of pulverized, solid, or atomized liquid fuels in accordance with Patent 541,158, characterized by the fact that gasification is carried out in a gasification chamber which extends mainly in a vertical direction.

Germany 551,761

## PROCESS FOR THE PRODUCTION OF A RICH GAS WHICH IS LOW IN NITROGEN

Metallgesellschaft A.G., Frankfurt am Main. Curt Müller, Frankfurt am Main, Germany

*Dec. 6, 1927.**Gr. 2, Cl. 24e*

The invention concerns a process for the production of a rich gas with a low nitrogen content through gasification of coal with steam, carbon dioxide, and oxygen or oxygen-enriched air, characterized by the fact that the gas produced with oxygen or with oxygen-enriched air is passed into the fuel bed in such quantity that the height of the fire zone in the gas producer is enlarged and the fire bed is made more uniform.

Germany 558,140

## WATER GAS OR DUAL GAS SYSTEM

Hermann Hebel, Vienna, Austria

*Mar. 10, 1931. Application filed in Austria Mar. 19, 1930.**Gr. 1, Cl. 24e*

The invention concerns a water gas or dual gas system, in which the conduction of the secondary air serving for the partial combustion of the blowing gas in the steam superheater during gasification, serves to conduct the superheated steam into the generator, characterized by the fact that in the secondary air or steam conduction, as the case may be, an oscillatable throttle valve is provided which is lifted from its throttle position during gasification through the flow of superheated steam, and opened, whereas during blowing, after shutting off of the steam through the secondary air, it is returned to its [proper] throttle position.

Germany 558,989

## GAS PRODUCER WITH REVERSE COMBUSTION

Ernst Mahlkuch, Greifenmühle bei Klützw, Germany

*Supplement to 547,555. June 16, 1931.**Gr. 5, Cl. 24e*

The invention concerns a gas producer with reverse combustion with an adjustable throttle device for the alteration of the cross section of the [gasification] shaft in the incandescent zone in accordance with Patent 547,555, characterized by the fact that the pressure of the gas produced is brought to bear on an elastic vessel which automatically causes the moving of the throttle device for the alteration of the cross section of the shaft.

Germany 558,990

## GAS PRODUCER WITH REVERSE DRAFT DIRECTION FOR TAR-YIELDING FUELS

Ernst Mahlkuch, Greifenmühle bei Klützw, Germany

*Supplement to 547,555. Aug. 11, 1931.**Gr. 5, Cl. 24e*

The invention concerns a gas producer with reverse draft direction for tar-yielding fuels in accordance with Patent 547,555, characterized by the fact that for the purpose of maintaining one of the tar-containing gases at a corresponding temperature as the gas zone traversed, even when different type fuels are being treated and when the loads vary, the cross section of the fire hopper in the incandescent zone can be altered by a variable throttle devices with varying hole sizes.

Germany 559,454

## PROCESS AND APPARATUS FOR THE GASIFICATION OF FUELS

Frank C. Greene, Chicago, U.S.A.

*Oct. 24, 1929.**Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of fuels with conduction of the gasification medium over the surface of the fuel spread out in a long layer, characterized by the fact that the upper surface of the fuel which is swept by the gasification medium is subjected to the heat of the reflected effect of a furnace arch running parallel to it.

Germany 561,446

**PROCESS FOR THE PRODUCTION OF A RICH GAS WITH A LOW NITROGEN CONTENT BY GASIFICATION OF FUELS WITH STEAM (CARBON DIOXIDE) AND OXYGEN OR OXYGEN-ENRICHED AIR**

Metallgesellschaft A. G., Frankfurt am Main. Curt Müller, Frankfurt am Main, Germany

*Supplement to 551,761. Apr. 13, 1930.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of a rich gas with a low nitrogen content by gasification with steam (carbon dioxide) and oxygen or oxygen-enriched air, in accordance with Patent 551,761, characterized by the fact that in the course of treatment of the fuels high in moisture content, the part of the gas produced which is to be passed back with the gasification medium in the process, is, after partial combustion, brought in contact with the high-moisture fuel to be gasified in such fashion that it absorbs all or a part of the moisture content of the said fuel.

Germany 560,782

**PROCESS FOR THE CONTINUOUS PRODUCTION OF RICH GAS FROM BITUMINOUS FUELS**

Metallgesellschaft A. G., Frankfurt am Main. Otto Hubmann, Frankfurt am Main, Germany

*Mar. 2, 1927.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the continuous production of rich gas from bituminous fuels in reaction chambers externally heated by means of the adduction of a mixture of steam and oxygen-enriched air, characterized by the fact that only a part of the fuel introduced is gasified, and that the ungasified part is removed from the reaction chamber and used for heating purposes, particularly for the heating of the reaction chamber and for the production of the steam used for gasification.

Germany 562,922

**ROTATING DRUM OVEN**

Kohlenveredlung und Schwelwerke A. G., Berlin, Germany

*Supplement to 508,952. May 17, 1928.*

*Gr. 3, Cl. 24e*

The invention concerns the use of a rotating drum oven in accordance with Patent 508,952, the drum space of which is divided by shaped bricks into treatment and heating ducts, for the continuous gasification of fine-granular fuels such as bituminous coal, lignite, coke, distilling coke, or the like, in which the starting material is introduced, together with the gasification medium (steam, air), under certain circumstances with technically pure oxygen, through the treatment conduits, and this in like or counterflow to the gasification medium.

Germany 563,006

**PROCESS FOR THE PRODUCTION OF A GAS WITH A HIGH HYDROGEN CONTENT THROUGH THE GASIFICATION OF FUELS WITH OXYGEN AND WITH STEAM**

Metallgesellschaft A. G., Frankfurt am Main. Curt Müller, Frankfurt am Main, Germany

*Jan. 5, 1930.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of gas with a high hydrogen content through the gasification of fuels with oxygen or with oxygen-enriched air and steam and through decomposition of the carbon monoxide contained in the gas according to the homogenous water-gas reaction, whereby the gasification is passed through the quiescent fuel bed or through the fuel in a state of suspension, characterized by the fact that the gasification of the fuel with oxygen or

air enriched with oxygen and little steam takes place with a high temperature which favors the formation of carbon monoxide in a reaction zone connected to the gasification zone, with adduction of additional steam, which is advantageously superheated and, under utilization of the catalyzer effect of the hot distillation coke to be gasified and/or of the distilled fuel, which reaches the gasification zone directly from the reaction zone.

Germany 563,846

**PROCESS AND APPARATUS FOR THE PRODUCTION OF TAR-FREE GASES IN GAS PRODUCERS WITH CENTRAL AIR INLET**

Julien van Hemelryck, Brussels, Belgium

*May 2, 1931.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the direct production of tar-free gases in gas producers with central air induction, characterized by the fact that the air is introduced to the incandescent fuel at a temperature which, if possible, corresponds to that of the fuel, and is constantly over 1,000° C., while the heat of the walls of the air induction tuyères is used to heat the air to this desired temperature, the said tuyères are prevented from becoming melted by the fact that by means of the air introduced over a device for the offtake of heat, enough heat is passed to the outside so that the temperature of the tuyères, which is composed of a fire-proof material or metal, remains below their fusion point.

Germany 564,607

**PROCESS FOR THE OBTAINING OF GAS AND OVEN FOR CARRYING OUT THE PROCESS**

Theodor Lichtenberger, Stuttgart, and Ludwig Kaiser, Herbede, Germany

*Supplement to 493,675. Apr. 5, 1930.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the obtaining a gas in accordance with Patent 493,675, characterized by the fact that the water gas produced through the gasification of the fuels in a salt-fusion bath is passed through the charge to be dried and degasified in a [gasification] shaft placed above the water bath, whereby a gas mixture of high calorific value is produced in a combined degasification and gasification process.

Germany 564,870

**PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF WATER GAS FROM FINE-GRANULAR OR PULVERIZED FUELS**

Werschen-Weissenfelser Braunkohlen A.G., Halle, Germany

*Dec. 6, 1927.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the continuous production of water gas from fine-granular or pulverized carbon-containing material, characterized by the fact that the material is preheated by blowing to a high heat and is introduced constantly and adjustably in and through a special steam-traversed gasification space, from which, after forming water gas, it is brought out, is cooled-off, and is once more introduced into the space for hot blowing.

Germany 564,988

**PROCESS AND APPARATUS FOR THE OBTAINING OF GAS**

Theodor Lichtenberger, Stuttgart, and Ludwig Kaiser, Herbede, Germany

*Supplement to 493,675. Mar. 9, 1930. Application filed in the U.S.A. on Mar. 29, 1929.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the obtaining of gas in accordance with Patent 493,675 in the case

of the treatment of moist volatile fuels, characterized by the fact that drying and degasification take place by means of a known type of [gasification] shaft which is familiar in water-gas producers and which is set on top of the gasification zone, is closed, and is heated externally through the withdrawing water gas, out of which shaft the degasified and dried fuel is introduced directly and in an incandescent state into the salt molten bath.

Germany 567,082

**PROCESS FOR THE REGULATION OF THE OPERATION OF RUNOFF GENERATORS**

Louis Chavanne, Paris, France

June 1, 1924. Application filed in France Feb. 13, 1924.  
Gr. 3, Cl. 24e

The invention concerns the process for regulating the operation of runoff generators in which exothermic reactions and, if necessary, endothermic reactions in the fuel are produced on the basal surface and at selected height points of a permeable fuel column of an appropriate height, characterized by the fact that a fusion zone of about one-eighth of the total height of the fuel column is maintained above the blast orifices, whereby the charging of the fuel mixture takes place in the customary manner with external temperature, while the temperature of the gases flowing through the entire fuel column, with raw fuel at the point of departure from the fuel column, should amount to about 350° C. at the most, regardless of the nature of the fuel mixture treated.

Germany 567,375

**PROCESS FOR THE UTILIZATION OF THE BLOWING GASES OF A WATER-GAS GENERATOR WHICH IS CONNECTED TO A FUEL DUST GASIFIER**

Jens Rude, Oslo, Norway

Apr. 22, 1931.  
Gr. 1, Cl. 24e

The invention concerns a process for the utilization of the blowing gases of a fuel dust gasifier connected to a water-gas generator operating with a fuel dust gasifier, characterized by the fact that a special heat accumulator is connected between the fuel dust gasifier and the water-gas generator, in which the secondary air for the combustion of the blowing gases is preheated with the aid of heat stored in it from the water-gas and steam mixture coming from the fuel dust gasifier.

Germany 568,851

**PROCESS AND APPARATUS FOR THE GASIFICATION OF FINE-GRANULAR FUELS**

Paul Berger, Gelsenkirchen, Germany

June 19, 1929.  
Gr. 3, Cl. 24e

The invention concerns a process for the gasification of fine-granular fuels for the production of fuel gases by coking and gasification taking place according to the countercurrent principle in a generator in continuous operation, characterized by the fact that beginning from the upper end of the generator, in a special part, which serves completely for coking purposes, of the shaft, high temperature coking of the fuel, which falls unhindered, is carried out through internal heating of this part of the shaft, while gasification of the coked fuel at a high temperature, by utilization of the heat residing in it, takes place in an ascending gas flow in another part of the shaft serving only for gasification, whereby the heavy parts of the descending coked fuel come to rest in the grate area, while the lighter parts rise in the gasification chamber.

Germany 569,211

**PROCESS FOR THE GASIFICATION OF PULVERIZED OR FINE-GRANULAR FUELS IN A STATE OF SUSPENSION**

Metallgesellschaft A. G., Frankfurt am Main. Curt Müller, Frankfurt am Main, Germany

Dec. 6, 1927.  
Gr. 1, Cl. 24e

The invention concerns a process for the gasification of pulverized or fine-granular fuels in a state of suspension by means of oxygen in mixture with steam with return of the useful gas produced in the process itself to the gas producer, characterized by the fact that the circulating useful gas is so introduced with the gasification medium into the gas producer that it burns with a part of the oxygen, even before the gasification media react on the coal to be gasified.

Germany 570,295

**GAS GENERATOR**

Alfred Jean Hereng, Paris, France

Aug. 20, 1929, application filed in France July 18, 1929.  
Gr. 4, Cl. 24e

The invention concerns a gas generator with a distillation chamber, the bottom of which is formed by a traveling grate, and with a gasification chamber located next to it, the bottom of which is also formed by a traveling grate, and in which the fuel is moved on in a horizontal direction, characterized by the fact that the bottom of both the distillation chamber and the gasification chamber is formed by a common traveling grate, whereby air is introduced at the back end of the traveling grate from below, and the flow of gas above the traveling grate comes out of the combustion and gasification zone and enters into the distillation zone and is also passed above the grate.

Germany 571,168

**PROCESS FOR THE GASIFICATION OF PULVERIZED OR FINE-GRANULAR FUELS**

Metallgesellschaft A. G., Frankfurt am Main. Curt Müller, Frankfurt am Main, Germany

Supplement to 569,211. Jan. 5, 1930.  
Gr. 1, Cl. 24e

The invention concerns a process for the gasification of pulverized or fine-granular fuels in accordance with Patent 569,211, characterized by the fact that sufficient useful gas is circulated so that all the oxygen required to support the gasification is consumed, even before the gasification media react on the coal to be gasified.

Germany 571,210

**PROCESS FOR THE PRODUCTION OF WATER GAS FROM INCANDESCENT COKE**

C. Otto & Co., G.m.b.H., Bochum, Germany

Aug. 13, 1927.  
Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas from incandescent coke by means of a shaft-shaped container to which the cooling medium is introduced countercurrent to the coke, characterized by the fact that at least a part of the steam and water-gas mixture emerging from the hottest part of the coke bed is passed to a periodically operated water-gas producer.

Germany 571,400

**PROCESS FOR THE PRODUCTION OF A NITROGEN-CONTAINING WATER GAS FOR AMMONIA SYNTHESIS**

Bamag-Meguain A.G., Berlin, Germany

Aug. 23, 1930.  
Gr. 1, Cl. 24e

The invention concerns a process for the production

of a nitrogen-containing water gas for ammonia synthesis with utilization of an intermittently operating water-gas generator, to which the nitrogen in the form of air is introduced with the steam required for the operation of the generator during the gasification period, characterized by the fact that in order to obtain a proportion of nitrogen in the gas mixture which will remain constant, the injection of air during the gasification periods is regulated in such a way that the quantity of air brought into the mass becomes less as the formation of water gas diminishes with the ending of the gasification period.

Germany 573,112

**PROCESS FOR THE PRODUCTION OF A GENERATOR GAS OF HIGH CALORIFIC VALUE IN A RUNOFF GAS GENERATOR**

Zsigmond von Gálócsy and Karl Koller, Budapest, Hungary

*Feb. 4, 1930. Application filed in Hungary*

*Nov. 28, 1929.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of a generator gas containing hydrocarbons and with a high calorific value in the runoff gas generator operated by means of oxygen in mixture with steam or carbon dioxide, characterized by the fact that the production of generator gas takes place in two separate gas processes, and in the first process a solid, liquid, or gaseous fuel is burned in a combustion chamber, which is separated from the gas producer proper but is still basically connected with it, with oxygen or oxygen-enriched air which is saturated with a quantity of steam, or under certain circumstances of carbon dioxide, which is required in the gasification process; and hereupon, in the second process, under certain circumstances air with an excess of oxygen, in order to obtain gasification, is led through the incandescent fuel column of a conventional runoff gas producer operating with liquid slag.

Germany 576,134

**PROCESS FOR THE PRODUCTION OF RICH GAS AND BY-PRODUCTS THROUGH GASIFICATION OF BITUMINOUS FUELS OR DEGASIFICATION RESIDUES BY MEANS OF STEAM UNDER HIGH PRESSURE**

Metallgesellschaft A.G., Frankfurt am Main. Otto Hubmann, Frankfurt am Main, Germany

*Mar. 22, 1931.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of rich gas and byproducts through gasification of bituminous fuels or degasification residues by means of steam under the pressure of several atmospheres, characterized by the fact that steam under conditions favorable to the formation of carbon dioxide and methane, particularly under preheating of the steam to over 600° C., preferably to 800°–1,000° C., and under pressure of about 5 atmospheres and over is made to react with the fuels.

Germany 577,725

**PROCESS FOR THE OPERATION OF RUNOFF GAS GENERATORS**

I. G. Farbenindustrie A.G., Frankfurt am Main. Walter Gross, Leuna, Germany

*Dec. 22, 1931.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the operation of runoff gas producers, characterized by the fact that the combustion zone is only kept at such temperatures that the slag is liquidified for part of the time, whereas during the remaining time the combustion zone is operated at substantially lower temperatures.

Germany 577,888

**PROCESS FOR THE GASIFICATION OF CAKING FUELS**

I. G. Farbenindustrie A.G., Frankfurt am Main. Fritz Winkler, Ludwigshafen am Rhein, Germany

*Nov. 6, 1931.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of caking fuels, characterized by the fact that the raw materials in fine-granular form and in a slow stream are distributed over the incandescent, appropriately high fuel bed of a gas producer, while the bed is moved throughout its entire height by the gasification media in the manner of a boiling liquid

Germany 579,419

**GAS PRODUCER**

I. G. Farbenindustrie A.G., Frankfurt am Main. Adolf Traut, Ludwigshafen am Rhein, Germany

*Feb. 2, 1930.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer for the continuous gasification of granular, and under certain conditions fuels containing dust, characterized by the fact that the lower part of the said gas producer contains one or several air blast funnels which are equipped below with an ejector device, through which the gasification material is blown rapidly and in an unhindered fashion, with partial gasification, and that collector basins are arranged sidewise of the funnels for the storing of the fuel, out of which basins the fuel is once more blown upward directly by the air blast funnels.

Germany 580,426

**PROCESS AND DEVICE FOR THE COMPLETE GASIFICATION OF SOLID OR LIQUID FUELS IN A DISPERSED FORM**

Franz Herzberg, Leisnig, Germany

*July 22, 1928.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the complete gasification of solid or liquid fuels in a dispersed form in externally heated chambers, characterized by the fact that the gasification chamber is fed with as large a quantity of fuel as permits a part of the said fuel to leave the chamber in an ungasified state, after withdrawal of the useful gas which has been produced by complete gasification; and that the combustible dust remainder thus obtained is gasified in a special chamber and this quantity of gas is used to increase the heat of or exclusively for the external heating of the chamber.

Germany 580,566

**PROCESS FOR THE OBTAINING OF GASES WITH A HIGH CARBON MONOXIDE CONTENT BY MEANS OF GASIFICATION OF A SOLID FUEL THROUGH OXYGEN AND STEAM AND/OR CARBON DIOXIDE**

Società Italiana Ricerche Industriali, Terni, Italy

*Feb. 6, 1929. Application filed in Italy Feb. 29, 1928.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the obtaining of gases of high carbon monoxide content by means of gasification of a solid fuel through mixtures of oxygen and steam and/or oxygen and carbon dioxide, characterized by the fact that the ashes which fall in the course of discharge are passed off with the departing gases as dust, without forming slag, a result which is achieved by maintaining a high temperature during gasification (above 1,500° C.) and a rapid rate of flow-speed (not below 10 meters per second).



Germany 580,664

## ARRANGEMENT FOR CONDUCTING FRESH AIR TO THE GASIFICATION ZONE OF GAS PRODUCERS

Imbert-Gasgeneratoren G.m.b.H., Berlin, Germany

Mar. 27, 1932.

Gr. 5, Cl. 24e

The invention concerns an arrangement for the conduction of fresh air to the gasification zone of gas producers, characterized by the fact that the pipes used for conducting the fresh air to the generator hearth are connected to the intake housing or housings and are so arranged and proportioned that, under the heat expansion of the generator hearth, they are made to bend and are able to withstand the radial pressure of the hearth.

Germany 582,495

## PROCESS FOR THE PRODUCTION OF WATER GAS

I. G. Farbenindustrie A. G., Frankfurt am Main. Carl Messerknecht, Leuna, Germany

Supplement to 438,843. Sept. 24, 1930.

Gr. 1, Cl. 24e

The invention concerns a further development of the process for the production of water gas according to Patent 438,843, characterized by the fact that both the steam and the fuel are introduced above a heat storage unit arranged in the gas producer.

Germany 583,415

## ARRANGEMENT ON REGENERATORS IN WATER-GAS PRODUCERS

Gas und Teer G.m.b.H., Berlin, Germany

Jun. 23, 1929.

Gr. 1, Cl. 24e

The invention concerns an arrangement on regenerators in water-gas producers for the continuous production of water gas from pulverized coal or liquid fuels and steam, whereby the necessary reaction heat is charged into a circulating flow of water gas in chambers operating on opposite sides, and the gas produced is used for the heating of the regenerator which is the coldest at the time, characterized by the fact that the regenerator chambers are interconnected at their hottest point, and that the heating gas is sucked into the chambers to be heated by means of connection of the chambers to the flue or to a similar suction device.

Germany 584,798

## PROCESS FOR REGULATING THE OPERATION OF RUNOFF GENERATORS

Louis Chavanne, Paris, France

Supplement to 567,082. May 16, 1925. Application

filed in France July 29, 1924

Gr. 3, Cl. 24e

The invention concerns a process for the regulation of the operation of runoff generators in accordance with Patent 567,082, characterized by the fact that dustlike fuel is introduced by means of special pipes arranged somewhat above the main blowing pipe for the purpose of supporting a fusion zone of low height.

Germany 585,355

## GAS PRODUCER WITH DOWNWARD-DIRECTED COMBUSTION

Ernst Mahlkuch, Greifermühle bei Klützw, Germany

June 16, 1931.

Gr. 5, Cl. 24e

The invention concerns a gas producer with downward-directed combustion and rectangular cross-section of the [gasification] shaft in the incandescent zone, par-

ticularly for the gasification of highly bituminous fuels, such as lignite briquettes, lignite coke, and the like, characterized by the fact that platelike inset devices are set in the incandescent zone of the shaft, which are appropriately provided with ribs on their under side and which can be built in or built out with the fire door arranged at one side of the shaft, in such a way that the open cross-section of the shaft can be altered by changing the number or proportions of the inset devices.

Germany 585,531

## PROCESS FOR THE PRODUCTION OF WATER GAS IN A BED OF FINE-GRANULAR FUEL

I. G. Farbenindustrie A.G., Frankfurt am Main. Fritz Winkler, Ludwigshafen am Rhein, Germany

Oct. 18, 1931.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas in a bed of fine-granular fuel, characterized by the fact that in the hot blowing period the charge of fuel is moved far enough by blowing in of underdraft so that the fuel is indeed mixed through, but no boiling motion occurs; and by the fact that at the same time, large quantities of air is blown at low speed against the upper surface of the fuel bed, so that a part of the fuel is burned with virtually exclusive formation of carbon dioxide.

Germany 586,182

## GAS PRODUCER FOR FINE-GRANULAR AND PULVERIZED FUELS

Carl Geissen, Berlin-Schöneberg, Germany

May 14, 1931.

Gr. 3, Cl. 24e

The present invention concerns a gas producer for fine-granular and pulverized fuels, in which the fuel in mixture with the gasification medium is introduced, and the sensible heat of the gases formed by return into the gasification space for gasification is made useful, characterized by the fact that the reactive mixture of coal dust, air, and under certain conditions steam, traverses a number of pipes in which it is heated by the fact that before entering the reaction space proper, the hot generator gases formed in the reaction chamber give up their sensible heat counter-current to the mixture flowing in the pipes; and by the fact that the generator gases wash around the pipes in countercurrent or in crosscurrent to the mixture, before they arrive in a cooled state in the gas purifier.

Germany 587,721

## PROCESS FOR GASIFYING SOLID FUELS WITH FUSION OF THE ASHES

Louis Chavanne, Paris, France

Supplement to Patent 567,082 Feb. 6, 1926. Application filed in France Feb. 11, 1925.

Gr. 3, Cl. 24e

The invention concerns a process for gasifying solid fuels with fusion of the ashes in accordance with Patent 567,082, characterized by the fact that gases from the distillation zone are drawn off by means of subdivisions arranged one above the other. The said gases are drawn off for the purpose of regulating the height of the fusion zone; and whereby, under certain circumstances, the various different hydrocarbons can also be drawn off separately by means of the said subdivisions.

Germany 588,715

## PROCESS FOR THE PRODUCTION OF A MIXTURE OF WATER GAS AND GENERATOR GAS SUITABLE FOR THE PRODUCTION OF SYNTHETIC AMMONIA

The Power Gas Corp., Ltd., and Niels Edward Rambush, Stockton-on-Tees, United Kingdom

June 14, 1930. Application filed in Great Britain Oct. 7, 1929.

Gr. 1, Cl. 24e

The invention concerns a process for the production of a mixture of water gas and generator gas suitable for the production of synthetic ammonia, with a constant nitrogen content, characterized by the fact that the outlet of a gas generator is regulated by means of the installation of the quantity of air to be used for the gas generator through the quantity of water gas flowing from a water-gas generator continuously, with the use of flow regulators, which are located at the pipe outlets of the water-gas generator and the gas generator, and which regulate a vent in the main air intake of the gas generator, under certain circumstances indirectly, through liquid pressure.

Germany 589,129

## ARRANGEMENT FOR THE PRODUCTION OF HYDRO-CARBON GAS OR WATER GAS FROM PULVERIZED COAL

Bamag-Mequin, A.G., Berlin, Germany

Sept. 29, 1929.

Gr. 2, Cl. 24e

The invention concerns an arrangement for the production of hydrocarbon gas or water gas from pulverized coal, which is brought onto a heated surface in a thin bed, characterized by an internally heated rotating drum made of fireproof material, from the interior space of which the combustion gases, and from the exterior side of which the useful gases, are passed off separately.

Germany 589,728

## PROCESS FOR THE OPERATION OF A WATER GAS PRODUCER WITH USE OF WASTE COAL AND ARRANGEMENT FOR THE CARRYING OUT THEREOF

Industries of America, Inc., Bridgeport, Conn., U.S.A.

Aug. 4, 1931.

Gr. 1, Cl. 24e

The invention concerns a process for the operation of a water gas producer with use of waste coal with a comparatively high ash content, the ash contained having a comparatively low fusion point, such as coal dust and coal refuse, characterized by the fact that a quantity of fuel is brought continuously to incandescence, but the combustion of the fuel is interrupted before a substantial portion of the ash is fused, at which point steam is passed through the incandescent fuel in order to produce water gas, and after this the greater part of the partially burned fuel is passed off, except for a remainder, which is just sufficient to introduce the combustion of a fresh charge, and is added to the fresh fuel to replace the discharged ash fuel.

Germany 589,766

## PROCESS FOR THE PRODUCTION OF RICH GAS IN WATER-GAS PRODUCERS WITH LOW-TEMPERATURE DEGASIFICATION

Christian Bolz, Berlin-Halensee, Germany

Aug. 26, 1931.

Gr. 2, Cl. 24e

The invention concerns a process for the production of rich gas in hydrocarbon gas producers with low-temperature degasification, characterized by the fact that the gas producer is operated with a distillation temperature of a maximum of 650° C. below and at least 250° C. above in the retort, and that the crude gas

which travels out of the distillation retort is passed through a coke filter arranged in the gas outlet pipe, which sucks up the tar components and other decomposition products, and whereby the coke to be filtered is carried into the distillation shaft each time fresh fuel is charged into the gas producer.

Germany 591,768

## GAS PRODUCER

Ernst Mahlkuch, Greifenmühle bei Klützw, Germany

Supplement to 547,555. May 15, 1932.

Gr. 5, Cl. 24e

The invention concerns a gas producer for reverse draft direction with a throttling device located in the fire box in an upper position, the said throttle device being adjustable and for the purpose of altering the cross section of the shaft in accordance with Patent 547,555, and with a sliding central nozzle, which is enclosed by the throttle device, characterized by the fact that the throttling device can slide independently of the central nozzle opposite the constriction of the fire box.

Germany 592,223

## PROCESS FOR THE PRODUCTION OF RICH GAS FROM BITUMINOUS FUELS OR DEGASIFICATION RESIDUES BY MEANS OF OXYGEN AND STEAM

Metallgesellschaft A. G., Frankfurt am Main. Otto Hubmann, Frankfurt am Main, Germany

Mar. 11, 1930.

Gr. 2, Cl. 24e

The invention concerns a process for the production of rich gas from bituminous fuels or degasification residues by means of oxygen and steam, characterized by the fact that gasification takes place under a pressure of several atmospheres by means of oxygen or air rich in oxygen and steam in such abundant quantities in comparison with the oxygen that the carbon of the fuel is converted predominantly into carbon dioxide and hydrocarbons.

Germany 593,519

## HYDROCARBON GAS PRODUCER

N.V. Machinerieën en Apparaten Fabrieken, Utrecht, Netherlands

Nov. 6, 1932.

Gr. 2, Cl. 24e

The invention concerns a hydrocarbon gas producer with a gasification shaft and a degasification shaft above the latter, whereby the degasification shaft is subdivided by means of star-shaped built-in devices, characterized by the fact that the refractory used for the star-shaped built-in devices, in their direction from the wall of the degasification shaft toward the center, are sloped upward, and are cut short in the center.

Germany 594,095

## WATER-GAS PRODUCER

Bamag-Mequin A.G., Berlin, Germany

Nov. 26, 1930.

Gr. 2, Cl. 24e

The invention concerns a water gas producer with a hollow top-piece arranged over the grate, characterized by the fact that the hollow top-piece has a height which is such that its topmost limit is still within the incandescent zone of the fuel in the gasification shaft and extends as far as a point close to the up-raised fuel bed in the degasification part, and that it is provided with outlet openings on its upper periphery for the escaping gasification media.

Germany 594,705

**PROCESS FOR THE PRODUCTION OF A RICH GAS SIMILAR TO ILLUMINATING GAS IN WATER-GAS GENERATORS**

Willi Schröder, Berlin-Charlottenburg, Germany

*June 21, 1931.**Gr. 2, Cl. 24e*

The invention concerns a process for the production of a rich gas similar to illuminating gas in water gas generators and from bituminous fuels, with connected distillation retort, characterized by the fact that a part of the water gas produced is used for the external heating of a carburetor which is arranged separate from the generator and from the degasification shaft and independently heated from the degasification shaft, and which carburetor converts the tar vapor contained in the mixed gas produced into gas.

Germany 595,739

**PROCEDURE AND APPARATUS FOR THE GASIFICATION OF SMALL-SIZED GRANULAR FUEL BY INTRODUCING SAID FUEL INTO THE COLUMN OF LARGE PIECES OF COKE IN THE GAS PRODUCER**

Annemarie Lotze geb. Klimpel, Berlin-Halensee, Germany

*May 21, 1932.**Gr. 1, Cl. 24e*

The invention concerns a procedure for the gasification of small-sized granular fuel by introducing it into a column of large pieces of coke in the gas producer, characterized by the fact that the small-sized granular fuel is introduced into the gas producer in a known fashion as a column surrounding the column made up of the large pieces of coke and is blasted into the voids of the coke column by steam jets.

Germany 596,839

**PROCESS FOR THE OPERATION OF WATER-GAS PRODUCERS WITH ALTERNATING GAS DIRECTION**

Bernhard Spitzer, Berlin-Halensee, Germany

*July 17, 1932.**Gr. 1, Cl. 24e*

The invention concerns a process for the operation of water-gas producers with alternating gas direction, for the most part for the use of strongly reactive fuels, porous gas coke, fine coke, semicoke, or the like, characterized by the fact that during ascending gasification steam is used, whereas during descending gasification, water is sprayed in from above.

Germany 598,496

**WATER-GAS PRODUCER FOR FINE-GRANULAR FUEL**

N.V. Machinerieën en Apparaten Fabrieken, Utrecht,

Netherlands

*Dec. 16, 1932.**Gr. 1, Cl. 24e*

The invention concerns a water-gas producer for fine granular fuel, in which, during hot blowing, steam is added, characterized by the fact that the introduction of steam takes place directly behind the place at which the blowing gas pipe is connected to the gas producer.

Germany 598,894

**PROCESS FOR THE HEATING OF SHAFT OVENS OR RETORTS**

Freiherr Georg Thumb von Neuburg, Frankfurt am Main,

Germany

*Dec. 16, 1932.**Gr. 2, Cl. 24e*

The invention concerns a process for the heating of shaft ovens or retorts which serve, for example, for the production of hydrogen gas, generator gas, rich

gas, distillation gas and the like, characterized by the fact that the shaft ovens or retorts are heated simultaneously throughout their entire height by means of separate hot gas flows directed from above to below and from below to above.

Germany 599,796

**PROCESS FOR THE PRODUCTION OF GASES OF HIGH CALORIFIC VALUE FROM BITUMINOUS FUELS IN TRIPLE GENERATORS**

Theodor Limberg, Halle, Germany

*May 16, 1931.**Gr. 2, Cl. 24e*

The invention concerns a process for the production of gases of high calorific value from bituminous coal, brown coal, or brown coal briquettes, peat, and other bituminous fuels in triple generators with the utilization of spülgas heat and indirect heating of the degasification shafts of similarly constructed generators connected in series, characterized by the fact that the generators simultaneously but separately, in three-way alternation, first are blown hot, secondly produce water gas and high-temperature degasification gas, which in mixture is used as spülgas for the third, last-connected generator, as well as for the expediting of the processes which take place in the latter, such as drying, distillation, and partial high-temperature degasification, and which, together with the products obtained, is passed, at an adjustable depth, through the hot-blown coke bed for tar-vapor cracking of its own tar or tars obtained from elsewhere, or oils, as well as for partial reduction of the carbon dioxide, whereby the heating of the degasification shafts is carried out by the blow gases produced, and if required by the addition of excess water gas obtained from elsewhere.

Germany 614,607

**GAS PRODUCER FOR THE CONTINUOUS GASIFICATION OF CAKING COAL**

Karl Bergfeld, Berlin-Halensee, Germany

*Sept. 17, 1932.**Gr. 4, Cl. 24e*

The invention concerns a gas producer for the continuous gasification of caking coal, with a distillation shaft arranged over the gasification shaft, in which a part of the gases produced in the gasification shaft is passed through a detour pipe at the place of connection between the distillation and gasification shafts, characterized by the fact that the connecting channel between the distillation shaft and the gasification shaft, sets up, by means of a corresponding proportioning of its length and by narrowing its cross section, such a resistance to being passed through [this zone] that none, or only negligible quantities, of the gases produced in the gasification shaft can flow through the connecting channel to the distillation chamber.

Germany 616,466

**PROCESS AND ARRANGEMENT FOR THE PRODUCTION OF A GAS MIXTURE OF WATER GAS AND NITROGEN OR OF HYDROGEN AND CARBON MONOXIDE**

Allgemeine Staubvergasungs G.m.b.H., Berlin-Wilmersdorf,

Germany

*Feb. 8, 1931.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of a gas mixture of water gas and nitrogen or hydrogen and carbon monoxide, characterized by the fact that a mixture of hydrocarbon-containing gases (crude water gas, double gas, illuminating gas, natural gas), steam, and fuel-dust is passed continuously, in a highly

heated condition and in a single intensive jet, into a reaction space, and is brought to the reaction point upon entry into the reaction space with air or oxygen or oxygen-enriched air.

Germany 616,980

**PROCESS AND DEVICE FOR THE PRODUCTION OF RICH GAS**

Metallgesellschaft A. G., Frankfurt am Main

*Supplement to 592,223. Mar. 28, 1930.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of rich gas from bituminous or degasified coal in accordance with Patent 592,223, characterized by the fact that fuel dust or fine-granular fuels are gasified in suspension at a high pressure.

Germany 617,274

**GAS PRODUCER**

N.V. Machinerieën en Apparaten Fabrieken, Utrecht, Netherlands

*Supplement to 612,971. Jan. 30, 1934.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer in accordance with Patent 612,971, characterized by an improvement which is such that, by rotation of the three-part cross-sectional view, it can be conceived of as originating around an axis which goes through the outer vertical boundary line of the charge shaft, whereby this outer edge is eliminated.

Germany 619,638

**INSTALLATION FOR THE PRODUCTION OF A GAS MIXTURE OF WATER GAS AND NITROGEN OR HYDROGEN AND CARBON MONOXIDE**

Allgemeine Staubvergasungs G.m.b.H., Berlin-Wilmersdorf, Germany

*Supplement to 619,638. Aug. 17, 1932.*

*Gr. 1, Cl. 24e*

The invention concerns an installation for carrying out the process described in Patent 616,466, wherein oxygen is introduced to the gas mixture to be converted, characterized by the fact that the producer machine for producing the necessary oxygen for the conversion is driven by high-pressure superheated steam which is produced by the sensible heat of the converted gases; and by the fact that the saturated steam, freed from pressure, which departs from the producer machine after a second superheating through the sensible heat of the converting gases, is introduced to the gas mixture to be converted.

Germany 620,392

**PROCESS FOR THE PRODUCTION OF A RICH GAS WITH A LOW CO<sub>2</sub> CONTENT**

Rudolf Drawe, Berlin-Charlottenburg, Germany

*Oct. 8, 1932.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of a rich gas with a low CO<sub>2</sub> content, characterized by the fact that in the upper part of a gas producer, a regulatable part of the fuel introduced is gasified with the aid of oxygen in parallel flow, whereas in the lower part, the gasification of the remaining fuel takes place in countercurrent with the aid of a mixture of oxygen and steam.

Germany 622,848

**SUCTION GAS PRODUCER FOR THE PRODUCTION OF TOWN GAS FROM YOUNGER (SOLID) FUELS**

Braunkohlen- und Brikett-Industrie A. G., Berlin, Germany

*May 30, 1933.*

*Gr. 2, Cl. 24e*

The invention concerns a suction gas producer for

the production of town gas from younger (solids) fuels in an externally heated shaft which encloses several consecutive zones including from bottom to top for the production of water gas, cracking of the distillation products, low-temperature carbonization and predegasification and drying, and which is heated by combustion of the coke remaining after gasification, characterized by the fact that the central gas offtake pipe which extends downward to the water-gas zone is greatly expanded in the central part approximately in the boundary zone between predegasification and low-temperature carbonization whereas the gasification shaft is conically constricted to prevent the passage of the combustion gases into the water-gas zone.

Germany 622,945

**DOUBLE GAS PRODUCER**

Carl Bleyer, Leipzig, Germany

*Supplement to 569,164. Apr. 11, 1929.*

*Gr. 2, Cl. 24e*

The invention concerns a double gas producer in accordance with Patent 569,164, consisting of a lower, internally heated section and an upper, externally heated degasification chamber, characterized by the fact that in the frontal wall of the generator, containing poke holes, besides the gas offtakes, arranged at different heights according to the main patent, an additional gas offtake is provided to collect the water gas in the upper portion of the gasification shaft during intermittent operation of the degasification process, to pass said gas through the fuel charge and to withdraw it from the lower portion of the degasification chambers.

Germany 624,169

**PROCESS FOR THE PRODUCTION OF A DETOXICATED TOWN GAS BY GASIFICATION OF BITUMINOUS FUELS OR DEGASIFICATION RESIDUES UNDER INCREASED PRESSURE**

Metallgesellschaft A. G., Frankfurt am Main. Friedrich Danulat, Frankfurt am Main, Germany

*Supplement to 592,223. Jan. 9, 1934.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of a detoxicated town gas by means of gasification of bituminous fuels or degasification residues under increased pressure in accordance with Patent 592,223, characterized by the fact that the pressure gasification takes place with air and sufficient quantities of steam for the formation of substantial quantities of methane and other hydrocarbon compounds, and by the fact that carbon monoxide and nitrogen are removed from the gas produced in a gas-decomposing installation connected afterward.

Germany 634,074

**OPERATING PROCESS FOR GAS PRODUCERS, IN WHICH THE SOLID FUEL IS EXPOSED ALTERNATELY TO THE INFLUENCE OF AIR AND STEAM**

C. Otto & Co., G.m.b.H., Bochum, Germany

*Feb. 22, 1934.*

*Gr. 3, Cl. 24e*

The invention concerns an operating process for gas producers in which the solid fuel is alternately exposed to the influence of air and steam, characterized by the fact that the gas producer is subdivided, with respect to the steam and air injection, into a large number of sections not separated by any type of intervening partitions, and this subdivision is such that the adjacent sections have a heat-exchange relationship with each other by means of conduction and radiation, and the exchange of the introduction of air and

steam takes place in all sections with the same period of time, in an adjacent but different phase.

Germany 634,877

PROCESS FOR THE OPERATION OF A SHAFT GAS PRODUCER

I. G. Farbenindustrie A. G., Frankfurt am Main. Oswald Pattenhausen, Leuna, Germany

June 3, 1931.

Gr. 3, Cl. 24e

The invention concerns a process for the operation of a shaft gas producer serving for the gasification and distillation of fine-granular fuel, in which the gases produced are drawn off entirely or partially below the upper surface of the fuel bed, characterized by the fact that the gasification media or the rinsing gases are introduced under pressure which is greater than the pressure of the fuel bed on the grate, and that at the same time, such a quantity of gas is drawn off below the upper surface of the fuel bed that the pressure of the fuel bed lying over the gas-offtake bed is greater than the gas pressure inside the gas-offtake bed.

Germany 636,762

PROCESS FOR THE GASIFICATION OF FINE-GRANULAR FUEL

Braunkohlen und Brikett Industrie A. G., Berlin, Germany

Supplement to 595,739. Sept. 19, 1934.

Gr. 1, Cl. 24e

The invention concerns a process for the gasification of fine-granular fuel in accordance with Patent 595,739, characterized by the fact that only the lower part of the shaft is charged with coke in large pieces, whereas the upper shafts, which are separated in a known fashion through a bridge from the lower shaft part, are charged with an unburnable and at the same time catalytically influencing construction material such as, for example, firebrick, pumice stone, or metals, or the like, in grid or otherwise loose form as heat carriers for the fine material which is to be laterally interspersed and gasified.

Germany 636,763

GAS PRODUCER FOR BITUMINOUS FUELS WITH DOWNWARD DIRECTED DRAFT

Bohumil Fleiser, Prague, Czechoslovakia

Oct. 4, 1932.

Gr. 5, Cl. 24e

The invention concerns a gas producer for bituminous fuels with downward directed draft and introduction of air in various heights of the fuel column, particularly for the obtaining of producer gas, characterized by the fact that the gasification space for normal gas supply has connected to it a supplementary gasification space for increased gas needs, which is laterally surrounded by a shaft section which is insulated and developed as an incandescent dome with openings for the adjustable introduction of additional air, whereby the annular space between the incandescent dome and a casing surrounding it serves for the offtake and heating of the tar vapors and distillation gases which are formed from the fuel above the supplementary combustion chamber and fall over the upper edge of the incandescent dome into the annular space, and which are introduced to the normal combustion space by means of inlet conduits which are spatially separated from the air-steam nozzles, and are introduced in such fashion that these gases enter the incandescent fuel in the combustion chamber without coming in contact with the combustion air.

Germany 642,526

PROCESS FOR THE PRODUCTION OF TOWN GAS FROM HYDROCARBON-CONTAINING GASES

I. G. Farbenindustrie A. G., Frankfurt am Main. Eduard Linckh and Fritz Winkler, Ludwigshafen am Rhein, Germany

Jan. 5, 1934.

Gr. 2, Cl. 24e

The invention concerns a process for the production of town gas from hydrocarbon-containing gases, such as distillation gases, cracking gases, waste gases from the pressure hydration of coal, tar, mineral oils, natural gases, and the like, in a gas producer operating by the use of oxygen, characterized by the fact that the hydrocarbon-containing gases, under certain circumstances together with steam and carbon dioxide, are blown into a gas producer operated with fine-granular fuel in such fashion that the solid fuel is set into rapidly whirling motion in a known manner, and separately therefrom, oxygen or oxygen-enriched air, under given circumstances together with steam or carbon dioxide, is introduced to the coal bed in such quantities that the waste gases have more or less the composition of standard town gas.

Germany 645,297

PROCESS FOR THE PRODUCTION OF WATER GAS FROM FINE-GRANULAR BITUMINOUS COAL

Ludwig Weber, Berlin-Wilmersdorf, Germany

Aug. 22, 1933.

Gr. 2, Cl. 24e

The invention concerns a process for the production of water gas from fine-granular bituminous coal in a double gas producer, characterized by the fact that the fine coal, when used with heat-resistant supplementary media, is formed into pressed fuel briquettes the caking capacity of which, corresponding to the coal to be gasified, is influenced by the mixture of different types of coal and choice of supplementary media; and by the fact that the pressed fuel briquettes which are dried by withdrawal of water are introduced directly to the gas producer after pressing and drying.

Germany 645,368

GAS PRODUCER FOR USE AS A PRODUCER-GAS GENERATOR

Carl Bleyer, Leipzig, Germany

Apr. 1, 1934.

Gr. 4, Cl. 24e

The invention concerns a gas producer according to Patent 621,141 for use as a producer-gas generator, characterized by the fact that, during continuous injection of a mixture of air and steam into the gasification shaft, the producer-gas formed in the latter is divided into two subcurrents, one of which is conducted into the lower part of the degasification top-piece and is drawn off at any height along with the distillation gas produced in the degasification chamber, whereas the other one flows into the heating ducts and is burned there by means of secondary air introduced through the said ducts.

Germany 645,477

PROCESS AND APPARATUS FOR THE PRODUCTION OF RICH GAS AND BYPRODUCTS BY THE GASIFICATION OF FUELS THROUGH STEAM UNDER HIGH PRESSURE

Metallgesellschaft A. G., Frankfurt am Main. Otto Hubmann, Frankfurt am Main, Germany

Supplement to 576,134. Dec. 18, 1931.

Gr. 2, Cl. 24e

The invention concerns a process for the production of rich gas [town gas] and byproducts by the

gasification of bituminous fuels or degasification residues through steam under pressure of several atmospheres, whereby the steam under pressure is heated by combustion gases, according to Patent 576,134, characterized by the fact that the gasification medium is heated directly in a superheater with combustion gases which are produced under pressure which is at least almost as high as that to which the gasification medium to be heated is subjected, and are passed through the superheater at this pressure.

Germany 647,142

**PROCESS FOR THE GASIFICATION OF FINE-GRANULAR FUELS**

I. G. Farbenindustrie A.G., Frankfurt am Main. Fritz Winkler and Edward Linckh, Ludwigshafen am Rhine, Germany

July 8, 1933.

Gr. 1, Cl. 24e

The invention concerns a process for the gasification of fine-granular fuels, which are agitated throughout their entire fuel-bed depth by the gases introduced, in the manner of a boiling liquid, characterized by the fact that, in addition to the gasification media proper, still other gases, such as water gas, producer gas, mixed gas, or the like, are introduced into the fuel bed laterally or from below, separately from the gasification media, [as well as] an appropriate part of the finished gas emerging above, from the gas producer.

Germany 649,196

**PROCESS FOR THE GASIFICATION OF CRUDE COAL DUST**

Géza Szikla and Arthur Rozinek, Budapest, Hungary

Apr. 19, 1933.

Gr. 3, Cl. 24e

The invention concerns a process for the gasification of crude coal dust, in which degasification and gasification take place in part in a state of suspension in the gasification chamber and in part in a condensing chamber connected to the said gasification chamber. The coal dust is introduced into the circuit, whereby the incandescent coke dust is passed out of the condensation chamber in the rising air current of the gasification chamber characterized by the fact that the fresh coal dust is strewn or scattered in the upper part of the gasification chamber in such a manner that the rising generator gases, which are at a high temperature, cause the easy liquidifying of the floating particles of slag and the effective gasification of the floating incandescent particles of coke are cooled by means of the fresh coal dust.

Germany 653,943

**HYDROCARBON GAS PRODUCER**

Bamaq-Mequin, A.G., Berlin, Germany

July 15, 1934.

Gr. 2, Cl. 24e

The invention concerns a hydrocarbon gas producer in accordance with Patent 628,901, characterized by the fact that the offtake device is composed of solid-walled beams of conventional fireproof construction material, below which the ducts serving to take off the hot blowing gases occur in the natural slope formation of the fuel charge.

Germany 657,028

**GAS PRODUCER WITH DESCENDING GASIFICATION**

Hansa-Gas-Generatoren G.m.b.H., Berlin, Germany. Hans Lutz, Berlin-Charlottenburg, Germany

Sept. 6, 1935.

Gr. 5, Cl. 24e

The invention concerns a gas producer with descending gasification, characterized by the fact that laterally

discharging fuel containers are arranged on the gas producer near the connection with the upper edge of the fire box. The fuel containers encircle the oxidation zone and thus are connected with the reduction zone of the gas producer, so that the distillation gases, which are formed in the fuel containers through the effect of the incandescence or through radiant heat from the fire zone, are able to pass directly into the reduction zone of the gas producers by means of the suction of the motor. The said gases, in so going, follow a passage of low flow resistance outside the incandescent zone, and for the most part, sidewise of the fire box.

Germany 657,242

**GAS PRODUCER FOR THE GASIFICATION OF SOLID FUELS WITH DESCENDING GASIFICATION**

Danneberg & Quandt, Berlin-Lichtenberg, Germany

Sept. 12, 1935.

Gr. 5, Cl. 24e

The invention concerns a gas producer for the gasification of solid fuels with descending gasification and a hollow annular device arranged between the fire box and the outer jacketing which, during operation, is traversed by the gasification air introduced into the gasification zone, characterized by the fact that between the upper edge of the hollow annular device which stands on the bottom of the gas producer and the fire box, there is only a comparatively narrow annular separation, through which the gas produced flows toward the gas offtake pipes arranged below the upper edge of the hollow annular device on the outer jacketing of the gas producer.

Germany 659,654

**ARRANGEMENT IN WATER-GAS PRODUCERS WITH ALTERNATING OPERATION FOR THE PRODUCTION OF GASES WITH A LOW NITROGEN CONTENT**

I. G. Farbenindustrie A.G., Frankfurt am Main. Julius Schierenbeck, Heidelberg, Germany

Dec. 20, 1935.

Gr. 1, Cl. 24e

The invention concerns a device for the offtake of gases occurring through pervious slide valves during hot blowing, or during an intergasification period in the useful gas piping before the usual water-gas installation, in water-gas producers with alternating operation for the production of gases with a low nitrogen content, characterized by the fact that the useful gas piping is connected by means of branch piping with a second, smaller plunger device with a gas offtake pipe, whereby the gases of lesser value follow a passage over the supplementary device as a result of the smaller plunger device opposite the main installation, to the offtake pipe, whereas during the useful gas period, the gas passage is turned off so that it automatically bypasses the supplementary device, through the pressure of the useful gas.

Germany 659,361

**GAS PRODUCER WITH DOWNWARD DIRECTED DRAFT FOR THE GASIFICATION OF SOLID FUELS**

Allan Talvio, Tammerfors (Tampere), Finland

Mar. 22, 1935.

Gr. 5, Cl. 24e

The invention concerns a gas producer with downward directed draft for the gasification of solid fuels, in which the gasification air is introduced through tuyères standing upright in the gas-producer shaft and in which the reduction pipe is arranged in the middle of a fuel-storage surface provided below the air-inlet place, characterized by the fact that the upper edge of the reduction pipe projects above the fuel-storage surface which extends to the wall of the gas-producer

shaft entirely filled with fuel, and the upper ends of the upright tuyères are laterally bent.

Germany 659,934

**GAS PRODUCER WITH REVERSE COMBUSTION**

Wilhelm Hürdich, Duisberg, Germany

*Apr. 16, 1935.*

*Gr. 5, Cl. 24e*

The invention concerns a gas producer with reverse combustion, in which the air-inlet pipes, which empty into the hearth, start from a common air-exhaust housing, characterized by the fact that the air-inlet pipes are integrally connected with either the air-exhaust housing or with the hearth, whereas they are flexibly connected at their other end.

Germany 659,956

**PROCESS FOR THE PRODUCTION OF WATER GAS IN CONNECTION WITH THE PRODUCTION OF TOWN GAS IN EXTERNALLY HEATED VERTICAL CHAMBER FURNACES**

Braunkohlen- und Brikett-Industrie A. G., Berlin. Woldemar Allner, Berlin, Germany

*Oct. 21, 1933.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of water gas in connection with the continuous production of standard town gas from solid coke-forming fuels with a high reactive capacity, such as brown coal, lignite, peat, and the like, in externally heated vertical chamber furnaces, whereby the degasification gas arising from the forming of coke and treated thermally in parallel with the said coke formation or separately is mixed with the water gas formed from the coke, characterized by the fact that this water gas is only produced under temperatures of 500° to 800° and with a corresponding excess of steam, so that a water gas of high carbon dioxide and methane content is produced, whereupon the CO<sub>2</sub> is removed from the gas mixture in a known manner.

Germany 659,978

**GAS PRODUCER WITH RISING GASIFICATION FOR THE PRODUCTION OF MIXED GAS**

Eduardo Collignon, Guadalajara, and Robert Falconer, Mexico City, Mexico

*Mar. 21, 1935.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer with rising gasification in continuous operation for the production of mixed gas from solid fuel with introduction of liquid fuel above the reduction zone, characterized by the fact that a short pipe ending above the fuel projects from above into the gas producer for the purpose of introducing the liquid fuel into the said gas producer, the said short pipe being coaxially encircled by a pipe which extends into the fuel bed as far as the vicinity of the reduction zone.

Germany 660,089

**GAS PRODUCER WITH DOWNWARD-DIRECTED DRAFT FOR BITUMINOUS FUELS CONTAINING WATER**

Hans Wittenhaus, Biehlra bei Liebenwerda, Germany

*Oct. 14, 1936.*

*Gr. 5, Cl. 24e*

The invention concerns a gas producer with downward-directed draft for bituminous fuels containing water, in which the gas produced departs upward by means of a pipe arranged in the center of the shaft, and in which the gasification air, which for heating pur-

poses traverses an annular space, encircling the gas producer shaft, from below to above, enters the upper end of the gas producer shaft and is uniformly distributed therein, characterized by the fact that on the gas offtake pipe in the upper shaft part of the gas producer, which serves as a drying space for the fuel, hollow ribs are arranged which are traversed by a quantity of the gas produced, in a quantity which can be altered by means of a device introduced in the gas offtake pipe; and by the fact that several pipes project into the drying room in order to take off a regulatable portion of the steam and the gasification air arising in the drying room, the said steam and gasification air being vented to the outside air, and the said several pipes being uniformly distributed over the cross-section of the shaft.

Germany 661,928

**GAS PRODUCER WITH SEVERAL GAS-PRODUCER SHAFTS**

Carl Loeser, Zwickau, Germany

*Aug. 16, 1934.*

*Gr. 7, Cl. 24e*

The invention concerns a gas producer with several gas-producer shafts for tar-yielding fuels, characterized by the fact that in the gas-producer shafts which are high in proportion to their cross section, and which are operated with an ascending draft, the gas offdraft, in the lower part of the shaft above the grate, is so arranged that the incandescent zone is kept low, and that the gases are introduced from there into the reduction shafts charged with non-tar-yielding fuel or fuels, which are provided with upper gas draft, and are passed to the zone of the incandescent fuel bed over the grate, which fuel bed has no free oxygen.

Germany 663,025

**WATER GAS PRODUCER FOR THE GASIFICATION OF COAL DUST**

Giulio Diena, Turin, Italy

*Oct. 31, 1934.*

*Gr. 1, Cl. 24e*

The invention concerns a water-gas producer for the gasification of coal dust with two chambers separated from each other, in which the first chamber partially consumes the coal and the latter comes to incandescence, whereas in the second chamber the coal reacts with steam, characterized by the fact that both chambers are arranged coaxially, the second inside the first, whereby the inner chamber is separated from the outer by means of a heat-conductive wall, and by the fact that the coal dust not consumed in the partial burning of the coal dust is deposited on the floor of the outer chamber serving for combustion, and is introduced separately from the combustion gases, by means of an injection device, in to the inner chamber serving for the production of water gas.

Germany 663,335

**WATER-GAS PRODUCER**

Bamag-Meguinn A. G., Berlin, Germany

*Feb. 8, 1933.*

*Gr. 2, Cl. 24e*

The invention concerns a water-gas producer with partitioning walls which subdivide the bed of fresh fuel in a vertical direction, characterized by the fact that the producer is equipped with a known type of central topiece on the grate, which reaches as far as the structure of the partitioning walls so that the core piece of the partitioning structure constitutes the continuation upward of the topiece.

Germany 664,190

**GAS PRODUCER FOR FINE-GRANULAR FUELS**

Paul Wasserzieher, Magdeburg, Germany

*Apr. 7, 1936.**Gr. 3, Cl. 24e*

The invention concerns a gas producer for fine-granular fuels, in which the annular reduction shaft is composed of two coaxial, sieve-like, cylindrical casings arranged one inside the other, whereby the inner casing is closed upward after the fashion of a roof. The fuel is charged into the outer cylinder casing which is extended upward and there developed in a solid-wall fashion, and the lower, sieve-like part of the outer cylinder casing is encircled at some distance by a gas offtake containing housing, characterized by the fact that the outer cylinder casing projects below the inner cylinder casing slightly and is so closed off by a grate that only a thin layer of fuel lies on the grate and the major part of the gases produced reach the inner space of the inner cylinder casing and from there [the gases] are passed through the annular reduction zone, the boundary surfaces of which are large in comparison with the grate surface, to the gas offtake.

Germany 664,524

**DOUBLE-FIRE GAS PRODUCER, ESPECIALLY FOR TAR-CONTAINING FUELS**

Humboldt-Deutzmotoren A. G., Köln, Germany

*Apr. 12, 1935.**Gr. 5, Cl. 24e*

The invention concerns a double-fire gas producer, especially for tar-containing fuels, with several air-inlet tuyères arranged in the cover plate and distributed uniformly over the cross section of the shaft in a downward direction, the said tuyères being for the upper fire, characterized by the fact that above the departure outlets of these tuyères, a middle-tuyère ends which has a horizontally emptying annular opening through which a current of air is injected horizontally and in a discoid manner into the fuel.

Germany 672,543

**WATER-GAS PRODUCER WITH A BUILT-IN CORE STRUCTURE**

Bamag-Meguín A.G., Berlin, Germany

*Feb. 15, 1933.**Gr. 1, Cl. 24e*

The invention concerns a water-gas producer with a centrally built-in core structure, characterized by the fact that the core forms a hollow column which penetrates the entire charge of fuel for the drawing off of the hot blowing gases, and by the fact that the opening for the offtake of the blowing gases is located in the hollow column above the fuel bed.

Germany 672,721

**PROCESS FOR THE GASIFICATION OF COAL IN WATER-GAS INSTALLATIONS IN ALTERNATING OPERATION**

Bamag-Meguín A.G., Berlin, Carl Miedbrodt, Berlin-Tegel, Germany

*May 23, 1933.**Gr. 2, Cl. 24e*

The invention concerns a process for the gasification of coal in water-gas installations with alternating operation, in which the coal, before feeding into the gas generator, is pretreated in a special distillation space by means of heat, and this to such an extent that the heat rising up from the water-gas part of the generator is sufficient to bring about completely the degasification of the coal fed into the generator and/or a mixture of fresh coal and coal coming from the distillation room, the said degasification taking place in the distillation

room of the generator, characterized by the fact that the quantities of hot water gas produced in the water-gas part, mixed with undistintegrated steam, after having traversed the fuel which fills the distillation space of the generator, increased by the gases developed in the distillation room, reach the heat storage device, which is heated by the waste heat from hot blowing of the gas generator; and by the fact that the gases in the latter then are heated again by the stored waste heat from blowing gases in the same operation cycle and are introduced into the space in which the coal is pretreated for charging of the generator distillation space.

Germany 672,921

**GAS PRODUCER**

Société Anonyme de Gestion et d'Exploitation de Brevets, Freiburg, Switzerland

*Sept. 13, 1935. Application filed in France July 1, 1935.**Gr. 7, Cl. 24e*

The invention concerns a gas producer composed of a combustion chamber charged with bituminous fuel and a reduction chamber arranged inside the said combustion chamber, and connected thereto, which contains a fuel with a reductive effect which is heated exclusively by the combustion chamber, characterized by the fact that rows of air-inlet openings superimposed one over the other are provided for the introduction of air into the combustion chamber, around the periphery of the latter, in the upper part of the reduction chamber.

Germany 679,858

**GAS PRODUCER FOR THE GASIFICATION OF SOLID FUELS IN CROSSFLOW**

Ernst Mahlkuch, Greifenmühle bei Klützwow, Germany

*June 9, 1936.**Gr. 3, Cl. 24e*

The invention concerns a gas producer for the gasification of solid fuels in crossflow, in which the gasification air is introduced by means of an air jet which projects axially into the gas producer, from the upper part of the gas producer, into the gas producer, and the gas produced flows on all sides of the periphery of the shaft in the annular space between the inner and outer shaft casing, from which it is extracted, characterized by the fact that, along with provision of an air nozzle which can be adjusted to correspond to the scorification on the inner shaft casing, for the extraction of gas, several rows of holes, annular slots, or the like are arranged over one another in such fashion that with varying adjustments of the air nozzle, the gas can also be removed from the shaft at a varying height.

Germany 682,034

**GAS PRODUCER FOR THE GASIFICATION OF FINE-GRANULAR FUEL**

Géza Szikla and Arthur Rozinek, Budapest, Hungary

*Oct. 8, 1936.**Gr. 3, Cl. 24e*

The invention concerns a gas producer for the gasification of fine-granular fuel in a state of suspension, in which the gasification air is introduced through a bottom opening and the slag is removed through the same bottom opening, characterized by the fact that at the bottom opening an endless moving belt or a rotating drum, with cracks the size of which can be regulated for admission of the gasification air is arranged along the said belt or drum, and that above the bottom opening, an intervening floor provided with an opening, is so installed in the high-temperature area that the edge of the second opening entirely or partially covers over the edge of the first opening.



Germany 682,600

## ARRANGEMENT FOR THE GASIFICATION OF FINE-GRANULAR FUEL

Géza Szikla and Arthur Rozinek, Budapest, Hungary

May 26, 1935.

Gr. 3, Cl. 24e

The invention concerns an arrangement for the gasification of fine-granular fuel which is introduced through a gasification chamber and to a condensation chamber arranged in connection with and next to the said gasification chamber, whereby the coke produced in the condensation chamber is introduced to the ascending air flow of the gasification chamber, characterized by the fact that the charging device serving to admit the fresh fuel empties into the upper part of the condensation chamber in such fashion that the entire charge of fresh fuel trickles down in a fine dispersion which spreads over the entire width of the condensation chamber, without filling the opening which connects the upper ends of the gasification chamber and the condensation chamber.

Germany 684,373

## GAS PRODUCER

Société Anonyme de Gestion et d'Exploitation de Brevets, Freiburg, Switzerland

June 6, 1937.

Gr. 7, Cl. 24e

The invention concerns a gas producer composed of a combustion chamber charged with bituminous fuel and a reduction chamber connected to the said combustion chamber, which contains a reductively acting fuel heated exclusively by means of the combustion chamber, whereby the gases traverse the combustion chamber in an upwards direction and traverse the reduction chamber connected to the combustion chamber at its lower end in a downward direction, characterized by the fact that on the outer side of the upper part of the reduction chamber, an annular duct, serving to admit the combustion air to the combustion chamber, is provided which extends above the lower end of the reduction chamber into downward-directed and outward-bent tuyères.

Germany 684,662

## VERTICAL CHAMBER OVENS FOR THE CONTINUOUS PRODUCTION OF WATER GAS AND TOWN GAS

Braunkohlen- und Brikett-Industrie A.G., Berlin, Germany

Supplement to 659,956. May 23, 1935.

Gr. 2, Cl. 24e

The invention concerns a vertical chamber oven for the carrying out of the process described in Patent 659,95, characterized by the separate and independently regulatable heating of the water-gas zone and by the arrangement of steam inlets at various levels of the lower part of the chamber.

Germany 685,291

## PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS COMPOSED PRINCIPALLY OF HYDROGEN AND CARBON MONOXIDE

Franz Fischer, Mühlheim, Germany

July 17, 1935.

Gr. 1, Cl. 24e

The invention concerns a process for the production of synthesis gas composed principally of hydrogen and carbon monoxide, in a water-gas generator operating alternately, characterized by the fact that hot blowing with oxygen is mixed with steam, and that gasification takes place with a gas which contains steam and hydrocarbon, especially methane, whereby the gases occurring during both periods are mixed and only enough

steam is added to the oxygen used for hot blowing so that the heat required in gasification, for the disintegration to the fullest possible degree of the steam and hydrocarbon, can be stored.

Germany 685,921

PROCESS FOR THE GASIFICATION OF COAL DUST  
Hans Schmalfeldt, Kassel, Germany

July 2, 1937.

Gr. 3, Cl. 24e

The invention concerns a process for the gasification of coal dust with a mixture of air and steam in parallel flow with preheating, in stages, of the mixture at a temperature, which permits complete ignition, of at least 700° C., characterized by the fact that the last stage of preheating is achieved by means of the admixture of hot gases which are produced by means of a special burner.

Germany 685,975

## PROCESS FOR THE PRODUCTION OF HYDROCARBON GAS IN ALTERNATING OPERATION

Carl Bleyer, Leipzig, Germany

Feb. 26, 1932.

Gr. 2, Cl. 24e

The invention concerns a process for the production of hydrocarbon gas with a high calorific value in alternating operation, in which the carbon dioxide coming from the upper part of the degasification shaft of a gas producer is removed and is introduced again below, and in which, in the degasification shaft, gasification only occurs downward, whereas in the gasification shaft gasification only occurs upwards, characterized by the fact that the carbon dioxide at the lower end of the gasification shaft is once more introduced into the said lower end, and the water gas which arises is introduced into the upper part of the degasification shaft, whereas the mixture of distillation and water gas is removed from the lower part of the degasification shaft.

Germany 686,410

## GAS PRODUCER WITH ASCENDING DRAFT

Werner Schellow, Koblenz, Germany

Nov. 11, 1937.

Gr. 3, Cl. 24e

The invention concerns a gas producer with ascending draft and a gas offtake pipe which projects into the shaft from above to the gasification zone, characterized by the fact that the gas offtake pipe at the lower end has a conical taper, and through the center thereof an air-inlet pipe which can be lifted and lowered is introduced, the lower end of which projects into the fuel and is broadened, whereby in the broadened section air outlet openings which are horizontal and empty into the shaft at an equal height, and which are uniformly distributed in the said broadened section, are provided.

Germany 686,761

## PROCESS FOR THE GASIFICATION OF PULVERIZED FUELS WITH THE AID OF HIGHLY HEATED CIRCULATING GAS

Wintershall A. G., and Hans Schmalfeldt, Kassel, Germany

Nov. 27, 1934.

Gr. 1, Cl. 24e

The invention concerns a process for the gasification of pulverized fuels which are produced from relatively easily crumbling crude fuels such as crude brown coal and the like, with the aid of highly heated circulation gas in continuous circulation in connection with a circulating dryer charged by means of the flow of cir-

culating gas, characterized by the fact that the quantity of circulating and useful gas which is charged with the wholly or partially gasified dust serves, in the circulation dryer, under certain circumstances with combined trituration, to dry and to triturate the necessary amount of coal for the process, whereby a part of the dust obtained from the circulation dryer is permanently removed from the circulation so that the ash content of the coal-dust to be gasified is kept at a proportionate level.

Germany 688,014

**GAS PRODUCER WITH DOWNWARDS-DIRECTED COMBUSTION**

Christian Stoll, Köln-Sülz. Klöckner-Humboldt-Deutz A.G., Köln, Germany

*Supplement to 592,608. Nov. 28, 1937.  
Gr. 5, Cl. 24e*

The invention concerns a gas producer with downward-directed combustion, especially for vegetable waste products, in which air is introduced from top to bottom through an air pipe arranged through the center of the gas producer, the said air pipe emptying below into a blast pipe built in the form of a smooth hollow cone in accordance with Patent 592,608, characterized by the fact that inside the blast pipe in the form of a hollow cone, an advantageously conical deflecting body is arranged which, together with the jacketing of the air nozzle, forms an annular opening which directs the air against the upper edge of the sloping hopper.

Germany 688,046

**VERTICAL CHAMBER OVEN FOR THE CONTINUOUS PRODUCTION OF WATER GAS OR SYNTHESIS GAS**

Alfred Jäppelt and Adolf Steinmann, Freiberg, Germany

*May 28, 1936.  
Gr. 1, Cl. 24e*

The invention concerns a vertical chamber oven for the continuous production of water gas or synthesis gas, with narrow externally heated gasification chambers and, upon occasion, an opening for the entry of steam under several chambers, characterized by the fact that the steam entry is not at the lower end of the chambers, but rather at a distance about halfway between the ash-outtake and the chambers.

Germany 688,090

**RECUPERATOR FOR THE PREHEATING OF COAL DUST IN CONTINUOUS PRODUCTION OF WATER GAS**

Curt Gerdes, Berlin-Lankwitz. Julius Pintsch, Berlin, Germany

*Oct. 2, 1936.  
Gr. 1, Cl. 24e*

The invention concerns a recuperator for preheating coal dust for continuous water gas production by means of a highly heated circulating flow of gas, in which the freely descending dust is heated by means of high-temperature heating gases in countercurrent, characterized by the fact that the recuperator is composed of two separate chambers which are traversed one after the other by the heating gas, of which the lower chamber contains a fireproof masonry structure in which vertical canals for the material falling through the chamber are provided, whereas in the upper chamber, steel pipes are provided which are arranged in such relationship to the vertical canals in the fireproof masonry structure that the material can descend freely through both chambers, and that at the separation point of the two heating chambers, an offtake for the distillation products is provided.

Germany 688,143

**PROCESS FOR THE PRODUCTION OF WATER GAS**

Otto Twittenhoff, Werdohl, Germany

*Sept. 2, 1934.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas by means of a flow of steam which is heated in heat accumulators operating alternately on opposite sides and arranged in open connection with each other and with the water-gas producer, characterized by the fact that in the connecting pipes between the gas producer and the heat accumulators, throttle points—for example, tuyères—are built in and the steam is produced under correspondingly higher pressure.

Germany 690,065

**PROCESS FOR THE PRODUCTION OF STEAM FOR WATER-GAS INSTALLATIONS**

Curt Gerdes, Berlin-Lankwitz. Julius Pintsch, Berlin, Germany

*Dec. 5, 1936.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of steam for water-gas installations operating alternately by using one of the heat-storage devices heated by blowing gases, the said heat-storage device being composed of an evaporation chamber, into which water is sprayed during the gasification period, and of a superheater chamber, characterized by the fact that, for purposes of evaporating the water sprayed into the evaporation chamber, superheated steam from the superheating chamber is recirculated and the steam so produced can be introduced to the gas producer either directly at a temperature near saturation or through the superheater in a highly superheated condition.

Germany 690,303

**SHAFT GENERATOR WITH GRATE FOR THE SIMULTANEOUS GASIFICATION OF LARGE-GRANULAR AND FINE-GRANULAR FUEL**

Walter Kopmann, Berlin-Halensee, Germany  
Didier-Werke A. G., Berlin-Wilmersdorf

*Oct. 31, 1937.  
Gr. 3, Cl. 24e*

The invention concerns a shaft generator with a grate for the simultaneous gasification of large-granular and fine-granular fuel, in which the large-granular material is charged into the shaft from the shaft cover, characterized by the fact that the introduction place, for the fine-granular fuel on the side of the gas producer opposite the gas offtake closely above the incandescent zone, is so arranged that the fine-granular fuel flows into the shaft in a thin layer advantageously spread over the entire width of the grate, without being substantially burdened by the column of large-granular fuel descending in the column.

Germany 693,370

**PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS FOR PRESSURELESS GASOLINE SYNTHESIS**

Wintershall A.G. and Hans Schmalfeldt, Kassel, Germany

*Feb. 5, 1936.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas for the pressureless synthesis of gasoline from predominantly brown coal or brown-coal products with heat supplied by means of circulation gas and return of the remaining gases from the synthesis into the circuit of the circulating gas, characterized by the fact that the carbon dioxide is wholly or partially scrubbed out of the remaining gas before it is returned into the circuit.

Germany 693,432

## PROCESS FOR OPERATING RUN-OFF GAS GENERATORS

Walter Gross and Franz Sabel, Leuna. I.G. Farbenindustrie A.G., Frankfurt am Main, Germany

*Supplement to 577,725. Nov. 26, 1938.**Gr. 3, Cl. 24e*

The invention concerns a process for the operation of runoff gas generators in accordance with Patent 577,725, characterized by the fact that the temperature adjustment is influenced by the accompanying use of hydrocarbons or gases containing hydrocarbons.

Germany 696,026

PROCESS FOR THE PRODUCTION OF A WATER GAS WITH A HIGH CO<sub>2</sub> CONTENT

I.G. Farbenindustrie A.G., Frankfurt am Main. Hans Bähr, Leuna, Germany

*Apr. 22, 1936.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas with a high CO<sub>2</sub> content in continuous ascending gasification, from fuels such as brown coal, bituminous coal, peat, wood, or the distillation residues thereof, through steam in connection with oxygen or gases containing oxygen or carbon dioxide and with the introduction of heat by means of the gasification media or by means of indirect heating devices for the fuel, characterized by the fact that the gasification media or the heating devices, or both, are made effective at various high places in the gasification shaft in such fashion that alternating hot and cold zones are formed in the fuel bed.

Germany 699,511

## PROCESS FOR THE GASIFICATION OF PULVERIZED FUEL OR FINE-GRANULAR FUEL WITH CIRCULATING GAS

Wintershall A.G. and Hans Schmalfeldt, Kassel, Germany

*Supplement to 686,761. Feb. 26, 1936.**Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of pulverized fuel, preferably crude brown coal and similar fuels, with water gas or producer gas in accordance with Patent 686,761, with the use of a sludge-circulation process for the drying of the damp filtered sludge and the remaining dust removal, characterized by the fact that this drying takes place by means of the quantity of coal dust or carbonization coke dust removed from the installation and serving to adjust the ash content, and that the quantity of dust is removed at a temperature which is just such as to make possible the drying of the filter sludge.

Germany 699,512

## PROCESS FOR THE GASIFICATION OF CRUDE BROWN COAL DUST AND OF SIMILAR FUELS

Wintershall A.G. and Hans Schmalfeldt, Kassel, Germany

*Supplement to 686,761. Mar. 11, 1936.**Gr. 1, Cl. 24e*

The invention concerns a further development of the process in accordance with Patent 686,761 for the production of water gas and similar gases from crude brown coal, characterized by the fact that instead of the circulation drying described in the principal patent, any other type of drying is used in such fashion that drying and trituration of the crude coal introduced takes place with the hot waste gases and the hot dust from gasification.

Germany 700,940

## PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS BY MEANS OF GASIFICATION OF FUELS UNDER PRESSURE THROUGH MIXTURES OF OXYGEN AND STEAM

Friedrich Danulat, Frankfurt am Main. Metallgesellschaft A.G., Frankfurt am Main, Germany

*Patented Sept. 28, 1937.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of synthesis gas through the gasification of fuels under high pressure of several atmospheres by means of mixtures of oxygen and steam at temperatures which, under this pressure, automatically lead to the formation of synthetic methane, characterized by the fact that carbon dioxide is added to the gasification medium in such quantities, amounting to about half to three times the volume of oxygen used, that this synthetic methane formation is very substantially decreased, and that the proportion of carbon monoxide and hydrogen in the end-product gas attains a definite value amounting to about 1:2 or even higher.

Germany 703,747

## INSTALLATION FOR THE CONTINUOUS PRODUCTION OF WATER GAS

Hermann Hillebrand, Berlin-Mahlsdorf, Germany

*Sept. 20, 1934.**Gr. 1, Cl. 24e*

The invention concerns an installation for the continuous production of water gas by means of a heated mixture of circulation gas and steam, in which the installation is composed of the alternately operated recovery chambers and a gasification chamber each of which is composed of a connection between the recovery chambers and the gasification chamber which can be shut off only through regulation of the gas pressures, characterized by the fact that the connecting ducts between the recovery chambers and the gasification chamber have a tuyèrelike narrow section.

Germany 705,781

## RUNOFF GAS PRODUCER FOR WATER GAS

Heinrich Koppers G.m.b.H., Essen, Germany

*Mar. 5, 1936.**Gr. 1, Cl. 24e*

The invention concerns a runoff gas generator for water gas in which blowing occurs only upward and gasification only downward, characterized by the fact that the tuyères are arranged in the direct vicinity of the shaft hearth, and the gas offtake openings are arranged over them.

Germany 705,880

## PROCESS FOR THE GASIFICATION OF PULVERIZED FUEL OR FINE-GRANULAR FUELS

Wintershall A.G. and Hans Schmalfeldt, Kassel, Germany

*Supplement to Patent 686,761. Feb. 26, 1936.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of generator gas from pulverized fuel which is produced from comparatively easily crumbling crude fuels, such as crude brown coal and the like, in further development of Patent 686,761, characterized by the fact that out of the circulation dryer only that amount of dust specified according to the principal patent is recirculated to the gasifier, but gas produced is not recirculated.

Germany 706,303

## PROCESS FOR THE PRODUCTION OF WATER GAS AND SYNTHESIS GAS FROM BROWN COAL DUST

Wintershall A.G. and Hans Schmalfeldt, Kassel, Germany

*Apr. 1, 1936.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas, synthesis gas, and similar gases through gasification of brown coal dust in a stream of hot recycle gas, characterized by the fact that, in order to obtain a low methane content, the concentration of the brown coal dust per 1 m<sup>3</sup> recycle gas, measured at 0° C and 760 mm Hg, should exceed 500 g and that a portion of the pregasified semicoke should be returned to the stream consisting of highly superheated recycle gas and fresh dust, after degasification of said dust is completed.

Germany 706,304

## PROCESS FOR THE MANUFACTURE OF GAS, ESPECIALLY WATER GAS, AND GAS PRODUCER TO CARRY OUT SAID PROCESS

Theodor Lichtenberger, Stuttgart, and Ludwig Kaiser, Herbede, Germany

*Apr. 9, 1939.**Gr. 1, Cl. 24e*

The invention concerns a process for the manufacture of gases especially water gas, from solid fuels in a gas producer containing a bath of fused salt which is connected to a degasification chamber, heated by the fused salt bath in such a manner, that the distillation products and the solid residue are passed through the open end of the degasification chamber into the gasification chamber, which is heated by means of a heating chamber, where they are cracked and gasified by steam, while a portion of the solid residue is transferred to the heating chamber.

Germany 708,729

## GAS PRODUCER FOR THE GASIFICATION OF FUEL IN LARGE PIECES WHICH DISINTEGRATE DURING GASIFICATION

Fritz Winkler and Eduard Linckh, Ludwigshafen am Rhein, I. G. Farbenindustrie A.G., Frankfurt am Main, Germany

*Dec. 3, 1936.**Gr. 1, Cl. 24e*

The invention concerns a gas producer for the gasification of fuels in heavy, large pieces which disintegrate under heat, such as brown coal briquettes, brown coal, etc., characterized by the arrangement of one or several slanting grates in the upper part of the gasification shaft, on which the fuel slips downward, and at least one shaft separated from the gasification space which receives the fuel coming from the grate and from which the said fuel, with the aid of adjustable devices, is introduced into the lower part of the gas producer and into the fuel bed itself, in which the fuel, by means of the gasification media, is agitated in the manner of a boiling liquid throughout its entire bed height.

Germany 709,634

## PROCESS AND INSTALLATION FOR THE PRODUCTION OF WATER GAS IN TWO OR SEVERAL GAS PRODUCERS CONNECTED IN SERIES ONE BEHIND THE OTHER

Vergasungs-Industrie A.G., Vienna. Franz Volk, Vienna, Austria

*Feb. 17, 1937.**Gr. 2, Cl. 24e*

The invention concerns a process for the production of water gas or water-gas-containing gases in alternating operation from bituminous fuels with the use of at least two gas producers which are hot blown at

different times and are connected one behind the other at least during a part of the gasification period, characterized by the fact that in the gas producer which is last hot blown, gasification occurs downward, and that the gas producer in which gasification occurs downward is always connected as the last in the water-gas passage.

Germany 710,724

## PROCESS FOR THE PRODUCTION OF A HYDROCARBURETED GAS WITH A LOW HYDROCARBON CONTENT IN ALTERNATING OPERATION

Vergasungs-Industrie A.G., Vienna, Austria

*June 26, 1938.**Gr. 2, Cl. 24e*

The invention concerns a process for the production of a hydrocarbureted gas with a low hydrocarbon content in alternating operation, with alternating ascending and descending gasification, characterized by the fact that, during descending gasification, about at the transition point between the degasification and the gasification zone, a gas containing oxygen is introduced into the gas producer.

Germany 711,605

## RECUPERATIVE GAS HEATER

Heinrich Koppers, Essen, Germany

*Dec. 24, 1939.**Gr. 1, Cl. 24e*

The invention concerns a recuperative gas heater with a combustion shaft and distiller (shaft) at the lower end of the combustion shaft, characterized by the fact that the entry pipe for the rinsing steam is introduced centrally through the distiller, which is built of ceramic material, approximately as far as the upper edge of the distiller, in order to prevent corrosion of the masonrywork.

Germany 713,209

## PROCESS FOR THE CONTINUOUS PRODUCTION OF WATER GAS

Simon Schneider, Munich, Germany

*Apr. 2, 1939.**Gr. 1, Cl. 24e*

The invention concerns a process for the uninterrupted production of water gas from distillation coke, whereby the requisite heat of formation is brought in from outside through space-sealing heating surfaces of metal, characterized by the fact that the metal heating surfaces located in the oxidation zone are scrubbed during operation by a neutral or reductively acting protective gas and are thus protected from combustion.

Germany 713,913

## PROCESS AND DEVICE FOR THE PRODUCTION OF WATER GAS AND SYNTHESIS GAS OR FOR THE CRACKING OF GASES CONTAINING HYDROCARBONS

Hans Schmalfeldt, Kassel, Germany

*Dec. 16, 1937.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas, synthesis gas, and similar gases from fuels of any type, following the circulating gas process, whereby the circulation gas is highly heated through alternately heated heat accumulators, characterized by the fact that a relief heat accumulator is allocated to each heat accumulator, through which, during gasification, a part of the circulation gas flows and thereby, during simultaneous cracking of any hydrocarbons which may be present, releases its heat, and which serves to preheat the fuel during the heating period.

Germany 714,495

**PROCESS FOR THE GASIFICATION OF BROWN COAL DUST AND SIMILAR FUELS**Wintershall A. G., and Hans Schmalfeldt, Kassel, Germany  
*Supplement to 686,761. Feb. 16, 1936.**Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of crude brown coal dust and similar pulverized fuels by means of hot circulation gases by use of the waste heat of the gasification for drying and trituring the crude fuel introduced, in accordance with Patent 686,761, characterized by the fact that the precisely defined quantity of dust which must be removed from the installation in order to adjust the ash content of the said installation, is removed in the form of carbonization coke dust and such removal takes place at the gasifier or between the gasifier and the entry [point] of the crude fuel.

Germany 714,748

**WATER-GAS PRODUCER**

Heinrich Koppers G.m.b.H., Essen, Germany

*Mar. 5, 1936.**Gr. 1, Cl. 24e*

The invention concerns a water-gas producer for alternating operation, especially for hot blowing from below and gasification from above, with water-cooled distributor or collector projecting from below into the gasification chamber, for introducing hot blowing air or for taking off useful gas, characterized by the fact that the stationary water-cooled distributor or collector is conically broadened out below and rests on a cylindrical part around which a crushing ring is coaxially and suitably rotatable, the said crushing ring serving, together with the lower edge of the shaft, to form a slag crusher which simultaneously serves to carry the ashes out.

Germany 714,961

**PROCESS FOR THE CONTINUOUS GASIFICATION OF SOLID FUELS**

Heinrich Koppers G.m.b.H., Essen, Germany

*July 5, 1936.**Gr. 3, Cl. 24e*

The invention concerns a process for the continuous gasification of solid fuels such as brown coal, by means of a preheated mixture of air and steam in a shaft which is essentially vertical and which is provided below with a grate suitable for carrying out solid ashes, characterized by the fact that above the grate, through which a small amount of cold gasification medium is introduced, a mixture of steam and air of such composition and of such temperature (above 400°) is fed into the gas producer charge that the reaction temperature in the fuel bed remains below the fusion point of the ashes.

Germany 717,449

**SHAFT GENERATOR FOR THE SIMULTANEOUS GASIFICATION OF LARGE-GRANULAR AND FINE-GRANULAR FUEL**

Walter Kopmann, Berlin-Halensee. Didier-Werke A. G., Berlin-Wilmersdorf, Germany

*June 21, 1939.**Gr. 3, Cl. 24e*

The invention concerns a shaft generator for the simultaneous gasification of large-granular and fine-granular fuel, in which the fine-granular fuel is introduced, from above and separately from the large-granular fuel, on the side of the generator opposite the gas offtake, to an oblique or steeply sloping grate, characterized by the fact that a partial quantity of the total amount of air required for the combustion and/or

gasification of the fine-granular fuel is introduced to the said fine-granular fuel through an air-inlet point close to a place above the oblique or steeply-sloping grate, and is fed in such fashion that the said fine-granular fuel reaches the grate in an incandescent state.

Germany 718,340

**GAS PRODUCER WITH RECTANGULAR GASIFICATION SHAFT, IN WHICH GASIFICATION TAKES PLACE IN OR APPROXIMATELY IN CROSS-FLOW**

Hans Lutz, Berlin-Charlottenburg. Hansa-Gas-Generatoren G.m.b.H., Berlin-Reinickendorf, Germany

*May 29, 1938.**Gr. 3, Cl. 24e*

The invention concerns a gas producer with predominantly rectangular cross section, in which gasification takes place in or approximately in crossflow, and in which a vertical row of air-inlet nozzles, which can be closed off, is located opposite a single gas offtake. The gasifier is characterized by the fact that the fuel runs out directly below the air-inlet nozzles which can be switched on one after the other, the said fuel being discharged by gravity to the ash pit; and that an ash-removal door is provided in front of this chamber.

Germany 718,796

**PROCESS FOR THE OPERATION OF AN INSTALLATION FOR THE GASIFICATION OF PULVERIZED FUELS IN SUSPENSION BY MEANS OF A HEATED MIXTURE OF CIRCULATION GAS AND STEAM**

Wintershall A. G., and Hans Schmalfeldt, Kassel, Germany

*Nov. 27, 1934.**Gr. 1, Cl. 24e*

The invention concerns a process for the operation of an installation for the gasification of pulverized fuels in suspension by means of a heated mixture of circulation gas and steam, composed of heating chambers and a gasification chamber, each with a connection between the heating chamber and the gasification chamber which connection is open and can only be shut off by adjustment of the gas pressure; whereby the connecting ducts, for purposes of practical turning off of the gas passage from the heated heating chamber into the gasification chamber, or vice versa, are provided with a nozzle-like constriction, and in turn the gasifying heater chamber is operated with such over-pressure that despite the constriction in the connecting duct, the requisite amount of circulation gas and steam reaches the gasification chamber; characterized by the fact that the pressure in the heating chamber which stands open under heating is always kept slightly, in fact as slightly as possible, higher than in the gasification chamber, and that shutoff steam occurs in the connections between the heating chambers and the gasification chamber, so that during heating, the said shutoff steam reaches the gasification chamber in whole or in part.

Germany 727,676

**PROCESS FOR THE PRODUCTION OF WATER GAS, PARTICULARLY SYNTHESIS GAS FROM COAL DUST, ACCORDING TO THE CIRCULATING GAS PROCESS**

Heinrich Koppenberg, Berlin, Germany

*June 25, 1936.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas, particularly including synthesis gas, from coal dust and steam, according to the circulation-gas process, characterized by the fact that the fresh charge of coal is divided into one part (Coal A), which is added to the steam-containing circulation gas at peak temperature, and into another part (Coal B),

which is added to the circulation gas at a lower temperature.

Germany 801,214

PROCESS FOR THE PRODUCTION OF FUEL GASES, PARTICULARLY WATER GAS, FROM GRANULAR FUELS WITH A HIGH ASH CONTENT

Wilhelm Flesch, Neckargemünd. Badische Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany

*Patented in the Federal Republic of Germany*

June 18, 1949.

Gr. 1, Cl. 24e

The invention concerns a process for the production of fuel gases, particularly water gas, from granular to fine-granular fuels with an advantageously high ash content through periodic gasification in gas producers, characterized by the fact that the fuel bed, by means of exothermically reactive gasification media, particularly air, is hot blown from above to below, and then by means of endothermically reactive gasification media, particularly superheated steam, is similarly cold blown from above to below and following this a short period is added in which, by means of endothermically or exothermically reactive gasification media, particularly air, which are introduced from below or laterally, the fuel bed is kept in boiling motion until the slag which was formed in the two preceding main cycles in the upper parts of the fuel bed has dropped down onto the grate for purposes of removal from the gas producer.

Germany 803,067

PROCESS FOR THE GASIFICATION OF FINE-GRANULAR FUELS IN GAS PRODUCERS IN ALTERNATING OPERATION FOR THE PRODUCTION OF WATER GAS

Carl Miedbrodt, Giessen. Bamag Werke für Eisenverarbeitung A. G., Butzbach, Germany

*Patented in the Federal Republic of Germany*

Feb. 18, 1949.

Gr. 1, Cl. 24

The invention concerns a process for the gasification of fine-granular fuels in alternately operating gas producers for the production of water gas, in such a way that the hot blowing of the fine-granular fuel with oxygen-containing gases takes place from above to below, and the production of water gas through introduction of the gasification media under increased pressure takes place from below to above, whereby, through the state of suspension of the fuel, a sifting of the fuel occurs simultaneously with a descending of the slag into the lower part of the gas producer; characterized by the fact that the gasification medium is heated and superheated in order to lengthen the gasification period and in order to increase the buoyancy.

Germany 805,901

SHAFT GENERATOR FOR THE GASIFICATION OF CAKING FUELS AND PROCESS FOR THE OPERATION THEREOF

Zsigmond De Galocsy, Berg en Terblijt, Netherlands

*Patented in the Federal Republic of Germany*

Jan. 14, 1949.

Cl. 24e, Gr. 3

The invention concerns a shaft generator for the gasification of large-grain, carbon-containing materials which cake under heating, characterized by an upper, narrow part of the shaft filled with fresh fuel, into which a gas offtake pipe is centrally built, and by a broadened-out part of the shaft connecting below, in which such a separation of the material into larger and smaller parts is made possible so that the gas mixture produced and rising from the lower-lying gasification zone divides into individual streams.

Germany 808,058

PROCESS FOR THE GASIFICATION OF GRANULAR, PARTICULARLY OF FINE-GRANULAR, TAR-FORMING COAL WITH A HIGH ASH CONTENT

Fritz Winkler, Ludwigshafen am Rhein. Badische Anilin- & Soda-Fabrik, hafen am Rhein, Germany

*Patented in the Federal Republic of Germany*

Oct. 30, 1948.

Cl. 24e, Gr. 3

The invention concerns a process for the gasification of granular, particularly of fine-granular, tar-forming coal with a high ash content, whereby oxygen-containing gasification media are blown in from top to bottom (descending blowing), and in interrupted cycles, in order to permit the descent and removal of the slag and ashes formed; the coal bed is brought into boiling motion by gases introduced from below (ascending blowing); characterized by the fact that in ascending blowing first exothermically reactive gases, particularly air, and then endothermically reactive gases, particularly steam, are introduced and the fresh coal, is charged after obtaining an approximately uniformly highly heated incandescent coal bed.

Germany 811,484

GAS PRODUCER, ESPECIALLY FOR THE GASIFICATION OF FINE-GRANULAR FUEL

Demag A. G., Duisberg, and Wilhelm Flesch, Neckargemünd, Germany

*Patented in the Federal Republic of Germany*

Oct. 2, 1948.

Cl. 24e, Gr. 11

The invention concerns a gas producer, especially for fine-granular fuels, in which gas is alternately produced by descending and ascending blowing along with preparation of the fuel bed, characterized by the fact that the lower part of the generator has a built-in structure of fireproof material, especially of firebrick.

Germany 813,870

PROCESS FOR THE PRODUCTION OF CARBURETED WATER GAS

Max Goebel, Bochum. C. Otto & Co. G.m.b.H., Bochum, Germany

*Patented in the Federal Republic of Germany*

May 21, 1949.

Gr. 2, Cl. 24e

The invention concerns a process for the production of carbureted water gas in a gas producer the shaft of which is divided by means of a central reduction in area into a lower space serving for the formation of blue water gas, and an upper space serving for the fixing of the carburetion medium, whereby during the gasification period, steam is introduced under the grate and a mixture of steam and the carburetion medium is introduced below the reduction area; characterized by the fact that in each successive period, hot blowing takes place in an ascending and descending direction, whereas gasification only takes place in an ascending direction.

Germany 815,518

GAS PRODUCER

Hans Hurter, Köln-Kalk. Klöckner-Humboldt-Deutz A. G., Köln, Germany

*Patented in the Federal Republic of Germany*

Oct. 2, 1948.

Cl. 24e, Gr. 3

The invention concerns a gas producer with a ring built in below the fire zone, which ring constricts the shaft; characterized by the fact that the ring at the lower end of the shaft is arranged at such a distance from the fire zone that the drops of slag formed in the fire zone become hardened before they reach the ring.

Germany 816,284

PROCESS FOR THE GASIFICATION OF NONBITUMINOUS,  
SOLID FUELSZsigmond de Galocsy, Zürich, Switzerland. Vogogas S.A.,  
Lucerne, Switzerland*Patented in the Federal Republic of Germany*  
Mar. 29, 1950.  
Cl. 24e, Gr. 1

The invention concerns a process for the gasification of nonbituminous, solid fuel in a gas producer in which a primary gaseous fuel is completely burned in a combustion space functionally connected with the gas producer, the said combustion being by means of steam and oxygen; and the hot combustion gases are introduced, at the temperature at which they were produced, and with their entire heat content, into the gasification space of the gas producer and in which, moreover, a part of the gas produced in the zone of the gas producer is removed at a temperature of 1,000°-1,400° C.; characterized by the fact that the necessary primary fuel, steam, and oxygen are wholly or partially obtained by the fact that the part of the gas produced which is removed is introduced in whole or in part through a high pressure steam boiler and then, under certain circumstances after admixture of the part not passed through the boiler, is introduced to the combustion space of the gas producer as primary fuel; and by the fact that the high pressure steam is used as a medium for operating a turbine and the low-pressure steam coming out of the turbine enters the aforementioned combustion chamber; and by the fact that the energy produced by means of the turbine produces the operation of an installation for the production of oxygen, and the oxygen obtained in this manner passes into the combustion space, and if necessary, after admixture of the low-pressure steam which is also to be introduced into this combustion space.

Germany 817,010

## GAS PRODUCER

Hans Hurter, Köln-Kalk. Klöckner-Humboldt-Deutz A.G.,  
Köln, Germany*Patented in the Federal Republic of Germany*  
May 28, 1949.  
Cl. 24e, Gr. 3

The invention concerns a gas producer for solid fuels with introduction of the gasification air into the open upper surface of the fuel bed, characterized by the fact that the fuel charging shaft empties laterally into the gas producer shaft, and the latter is so sloped that the upper surface of the fuel bed slants crosswise to the axial direction of the shaft.

Germany 817,011

PROCESS FOR CARRYING OUT THE ASHES IN VEHICULAR  
GAS PRODUCERSHans Hurter, Köln-Kalk. Klöckner-Humboldt-Deutz A.G.,  
Köln, Germany*Patented in the Federal Republic of Germany*  
Oct. 2, 1948.  
Gr. 3, Cl. 24e

The invention concerns a process for the continuous carrying out of the pulverized and fine-granular components of the ashes from a gas producer serving for the operation of an engine, particularly a vehicular engine, characterized by the fact that the ashes in the gas producer are sifted, their pulverized and fine-granular components are collected, and they are continuously conveyed outside the gas producer into the open air by means of the ejector effect of the waste gases of the engine.

Germany 817,337

GASIFICATION OF FINE-GRANULAR FUELS IN ALTERNATING  
OPERATIONWilhelm Flesch, Neckargemünd. Demag A.G., Duisburg,  
Germany*Patented in the Federal Republic of Germany*  
July 19, 1949.  
Gr. 1, Cl. 24e

The invention concerns the gasification of fine-granular fuels in alternating operation, in which the gasification media pass through the hot fuel bed from top to bottom part of the time, and part of the time from bottom to top, characterized by the fact that the gasification media which contain oxygen or which are highly preheated, are introduced for the most part above the slag layer during the ascending cycle of the alternating operation.

Germany 818,825

PROCESS FOR THE GASIFICATION OF FINE-GRANULAR  
FUELS IN AT LEAST TWO INTERCONNECTED GAS  
PRODUCERSFerdinand Lampe, Ludwigshafen am Rhein. Badische  
Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany*Patented in the Federal Republic of Germany*  
Jan. 27, 1950.  
Gr. 1, Cl. 24e

The invention concerns a process for the gasification of fine-granular fuels in at least two interconnected gas producers through alternating ascending and descending gasification, whereby the descending gasification takes place with an exothermically reactive gasification media, particularly air or oxygen, if necessary together with steam, simultaneously in the gas producers; and the ascending gasification, in which the fuel bed is placed in boiling motion by the gasification media introduced from below, takes place at times only in one gas producer, and the gases developed hereby are passed through the other gas producer or producers from top to bottom, and this procedure is carried out after intervening of a descending period in all the gas producers in alternation with the other gas producer or producers; characterized by the fact that the exothermically reactive gasification media entering from top to bottom for the gasification of the fuel bed, particularly air or oxygen, if necessary together with steam, are introduced in large quantities through a wide pipe which is common to all the gas producers and which is blocked off at the next-following ascending gasification; and by the fact that then in this period still smaller quantities of the exothermically reactive gasification media are introduced from the top through separate narrow pipes.

Germany 819,569

PROCESS FOR THE COMPLETE UTILIZATION OF THE COM-  
BUSTIBLE DUST SWEEPED ALONG IN THE GAS DURING  
THE GASIFICATION OF PREDOMINANTLY FINE-GRANU-  
LAR FUELS IN GENERATORS WITH DESCENDING GASI-  
FICATION AND PREPARATION OF THE FUEL BED BY  
BLOWING FROM BELOWCarl Miedbrodt, Giessen. Bamac Werke für Eisenverar-  
beitung A.G., Butzbach, Germany*Patented in the Federal Republic of Germany*  
Dec. 8, 1949.  
Gr. 3, Cl. 24e

The invention concerns a process for the complete utilization of the combustible dust swept along in the gas during the gasification of predominantly fine-granular fuels in generators with descending gasification, in which the preparation of the fuel-bed takes place by means of sifting through blowing in a gasification medium introduced from below to above; characterized by the fact that the combustible hot mix-

ture produced during the fuel sifting, the said mixture being of combustion dust and gas, is completely burned through the addition of oxygen-containing gases and is utilized productively in a heat consumer such as, for example, a steam boiler.

Germany 819,713

PROCESS FOR THE PRODUCTION OF FUEL GASES ESPECIALLY SYNTHESIS GASES FROM COKE AND COAL, PARTICULARLY COAL YOUNGER THAN BITUMINOUS COAL, SUCH AS BROWN COAL OR BROWN COAL BRIQUETTES

Hans Waldemar Gloth, Ferdinand Markert, and Willibald Funk, Ludwigshafen am Rhein. Badische Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany

*Patented in the Federal Republic of Germany*  
Feb. 13, 1949.  
Gr. 3, Cl. 24e

The invention concerns a process for the production of fuel gases especially synthesis gases from coke on the one hand, and on the other hand, from coal in pieces, particularly coal younger than bituminous coal, such as brown coal or brown coal briquettes; characterized by the fact that the coke is gasified in a known manner in runoff gas producers, and the other fuels in pieces are gasified in a pre-connected runoff gas generator, whereby the gases developed last, which are appropriately low in carbon dioxide and steam, are introduced into or before the maximum-temperature zone of the runoff gas producer connected last in series.

Germany 821,096

PROCESS FOR THE PRODUCTION OF GASES OF HIGH CALORIFIC VALUE AND DEVICE FOR CARRYING OUT THE PROCESS

Friedrich Domann, Berlin-Reinickendorf, Germany. Vereinigte Werkstätten Wittenau G.m.b.H., Berlin-Borsigwalde, Germany

*Patented in the Federal Republic of Germany*  
Jan. 3, 1950.  
Gr. 1, Cl. 24e

The invention concerns a process for the production of gas of a high calorific value with the use of pressure as well as with the use of a gasification medium and an additional heat conveyor, whereby the heating of the gasification medium and of the heat conveyor occurs in two heat exchangers heated on alternate sides, characterized by the fact that along with the gasification process under pressure, and along with the heating of the gasification medium occurring under pressure, the heating of the heat exchanger which is at times not needed for heating the gasification medium and the heat conveyor also takes place under pressure.

Germany 823,015

GAS PRODUCER

Francis Leopold Melvill, Johannesburg, Union of South Africa. Anglo-Transvaal Consolidated Investment Co., Ltd., Johannesburg, Union of South Africa

*Patented in the Federal Republic of Germany*  
Jan. 10, 1950.  
Gr. 3, Cl. 24e

The invention concerns a gas producer with a vertical shaft for the gasification of solid fuels, characterized by devices for introducing the fuel at the lower end, devices for carrying out the ashes, and introduction of the gasification medium at the upper end of the shaft, and off take of the gases produced from the gasification zone.

Germany 823,316

GAS PRODUCER

Kurt Schmidt, Köln-Holweide, and Erich Bartha, Bergisch Gladbach. Klöckner-Humboldt-Deutz A.G., Köln, Germany

*Patented in the Federal Republic of Germany*

Oct. 2, 1948.  
Cl. 24e, Gr. 3

The invention concerns a gas producer with a predominantly pipe-shaped shaft, through which the fuel is moved with the aid of an endless screw or the like, characterized by the fact that the shaft is slanted and gasification as well as the conveying of the fuel are directed upward.

Germany 823,474

PROCESS FOR THE GASIFICATION OF FINE-GRANULAR FUELS IN GAS PRODUCERS WITH ALTERNATING OPERATION FOR THE PRODUCTION OF WATER GAS

Carl Miedbrodt, Giessen. Bamag Werke für Eisenverarbeitung A. G., Butzbach, Germany

*Supplement to 803,067. Patented in the Federal Republic of Germany Aug. 16, 1949.*  
Gr. 1, Cl. 24e

The invention concerns a process for the gasification of fine-granular fuels in gas producers with alternating operation for the production of water gas in such fashion that the hot-blowing of the fine-granular fuel takes place with oxygen-containing gasification from top to bottom and the water-gas production takes place through introduction of the gasification medium under increased pressure from bottom to top, whereby, through the state of suspension of the fuel, a sifting of the fuel takes place simultaneously and along with this a dropping of the slag into the lower part of the gas producer, in accordance with Patent 803,067; characterized by the fact that directly after hot-blowing of the quiescent fuel bed has occurred from top to bottom, the slag which has formed above on the fuel bed is cooled by means of a downward directed stream of cold gas or wet steam.

Germany 823,634

PROCESS FOR THE GASIFICATION OF COAL DUST IN SUSPENSION

Hans Schmalfeldt, Castrop-Rauxel, Germany

*Patented in the Federal Republic of Germany*  
June 27, 1950.  
Gr. 6, Cl. 24e

The invention concerns a process for the gasification of coal dust in suspension by means of a preferably preheated gasification medium, such as steam and oxygen or oxygen-containing gases; characterized by the fact that the coal dust is distilled with the gas produced through recuperative or regenerative heat exchange; that the gaseous and solid distillation products are separated from each other; that the gaseous distillation products, with the addition of a partial quantity of the gasification medium, are partially oxidized and thermally cracked in a part of the gas producer, and the hot cracking products are introduced to the part of the gas producer in which the solid distillation products are being gasified with the remaining quantity of the gasification medium.

Germany 823,635

PROCESS FOR THE PRODUCTION OF HYDROCARBON-FREE SYNTHESIS GAS THROUGH GASIFICATION OF COAL DUST IN SUSPENSION

Hans Schmalfeldt, Castrop-Rauxel, Germany

*Patented in the Federal Republic of Germany*  
June 23, 1950.  
Gr. 8, Cl. 24e

The invention concerns a process for the production



of hydrocarbon-free synthesis gas through gasification of coal dust in suspension by means of steam and a predominance of oxygen, characterized by the fact that alternately fresh dust and the dust (residual) released from the gas produced during the fresh-dust gasification period are gasified, whereby the gas produced during the residual-dust gasification period is introduced directly, and the gas produced after the fresh dust gasification period, after thermal cracking of the hydrocarbon materials contained in it through heating of the gas with steam and temperatures of predominantly 1,300° to 1,500°, is introduced to the useful gas piping.

Germany 824,660

**PROCESS FOR THE COMPLETE GASIFICATION OF COAL DUST IN SUSPENSION**

Hans Schmalfeldt, Castrop-Rauxel, Germany

*Patented in the Federal Republic of Germany*

*June 23, 1950.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the complete gasification of coal dust in suspension, characterized by the fact that the gasification products are divided into two partial flows of which the larger (the main flow), after cooling, removal of dust, and purification, is drawn off as a useful gas, whereas the smaller stream receives the dust removed from the main stream (residual dust) and the latter is subjected to an after-gasification, the product of which, after cooling and removal of dust, serves as a conveyor gas for the fresh coal dust.

Germany 828,427

**PROCESS AND APPARATUS FOR THE DISTILLATION AND GASIFICATION OF FUELS**

Otto Hubmann, Bad Homburg, Germany

*Patented in the Federal Republic of Germany*

*Oct. 29, 1949.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the distillation and gasification of fuels in a slanting chamber through leading-in of oxygen- and steam-containing gasification media into the fuel bed, characterized by two or several chambers, appropriately connected to a common fuel hopper or drying device in which, individually or by groups, alternately oxygen-rich and predominantly oxidizing gasification media and low oxygen, predominantly reductive gasification media are introduced.

Germany 829,345

**PROCESS FOR THE GASIFICATION OF COAL DUST**

Otto Pistorius, Duisburg, and Wilhelm Flesch, Neckargemünd.  
Demag A.G., Duisburg, Germany

*Patented in the Federal Republic of Germany*

*Mar. 24, 1949.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of fuels in dust form, characterized by the fact that the gases arising in the course of gasification of fuel dust admitted to a gasification chamber through nozzles, with oxygen or the like, are introduced from top to bottom through a bed of granular fuel for the purpose of removing the liquid volatile ashes and release of the sensible heat, the said fuel bed being subject periodically to a preparation process for the purpose of sifting the slag received.

Germany 829,346

**GAS PRODUCER FOR WASTE FUELS, PARTICULARLY FINE FUELS**

Wilhelm Müller, Alfeld am Leine, Germany

*Patented in the Federal Republic of Germany Oct. 4, 1949.*

*Gr. 3, Cl. 24e*

The invention concerns a gas producer for waste fuels, including fine fuels, such as sawdust, coal and peat fines, or the like, with the use of an air-blast nozzle, characterized by the fact that the air-blast nozzle, which is provided with openings with a radiating course, is arranged in a stationary fashion below the grate, and when the grate is deflected, serves simultaneously as a central support for the rotating grate.

Germany 829,483

**PROCESS FOR THE GASIFICATION OF FINE-GRANULAR FUELS**

Otto Pistorius, Duisburg, and Wilhelm Flesch, Neckargemünd.  
Demag A. G., Duisburg, Germany

*Patented in the Federal Republic of Germany Feb. 15, 1949.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of fine-granular fuels in alternating operation of ascending and descending gasification, along with preparation of the fuel bed through the blowing-in of gaseous media which put the fuel bed in a state of suspension; characterized by the fact that the ascending gases of a gas producer, for the purpose of gasifying the dust which has been swept along with them, of cracking the distillation vapors introduced with them and for the purpose of utilizing the heat of the water vapors introduced during the descending period pass through the coal charge of one or more other gas producers.

Germany 830,233

**PROCESS FOR THE PRODUCTION OF FUEL GASES FROM COAL DUST**

Hans Schmalfeldt, Castrop-Rauxel, Germany

*Patented in the Federal Republic of Germany Oct. 3, 1950.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of fuel gases from coal dust and a regeneratively heated mixture of air or oxygen-containing gas and steam; characterized by the fact that the coal dust is distilled by means of a part of the gas which is produced by means of the gasification of the distillation coke dust formed through distillation of the coal dust with the highly heated gasification media; and the mixture arising from this part of the gasification gas and the distillation gas is separated from the remaining part of the gasification gas and drawn off separately.

Germany 831,293

**VERTICAL OVEN FOR THE GASIFICATION OF FUELS**

Rudolf Mewes, Bochum-Linden. C. Otto & Co. G.m.b.H.,  
Bochum, Germany

*Patented in the Federal Republic of Germany Jan. 24, 1950.*

*Gr. 3, Cl. 24e*

The invention concerns a continuous or semicontinuously operated vertical oven for the gasification in crosscurrent and, if necessary, for the predegasification of fuels by means of crossflow scrubbing, the said oven having a lengthwise extended rectangular cross section with heating from one side of the width; characterized by the fact that on the heated width-side heating passages and arrangements for the introduc-

tion of the gasification or scrubbing media in a vertical direction follow alternately one after the other.

Germany 832,037

**PROCESS AND APPARATUS FOR THE PREHEATING OF GASEOUS AND VAPOROUS REACTIVE MEDIA FOR THE GASIFICATION OF PULVERIZED FUELS**

Friedrich Totzek, Essen, Germany. Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Patented in the Federal Republic of Germany  
Dec. 29, 1948.  
Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of pulverized solid fuels in suspension with oxygen and with preheated endothermically reactive gasification media, which are heated through the combustion of a gaseous fuel and admixture of the hot waste gases of combustion; characterized by the fact that the hot combustion gases are introduced into the reaction space in which gasification takes place, and are so introduced separately from oxygen but together with the remaining endothermically reactive gasification media, whereby the pulverized solid fuel, by means of a stream of an exothermically reactive reaction medium, preferably not preheated, in other words relatively cold oxygen, is blown into the gasification space.

Germany 833,836

**PRODUCTION OF METHANE-CONTAINING FUEL GAS FROM PULVERIZED SOLID FUELS**

Friedrich Totzek, Essen, Germany. Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Patented in the Federal Republic of Germany  
Dec. 8, 1949.  
Gr. 3, Cl. 24e*

The invention concerns a process for the production of methane-containing fuel gas through gasification of pulverized solid fuels in suspension with oxygen and with endothermically reactive gaseous media, so reacting with carbon at a high temperature; whereby the gas produced is brought into contact with a catalyst which expedites the formation of methane; characterized by the fact that the pulverized fuel is mixed with oxygen under high pressure but at a temperature below the ignition temperature. The mixture is blown continuously into a pressure-resistant reaction chamber kept at a high temperature, where it is ignited without substantial alteration of the pressure and is brought to a reaction, whereby a medium under high pressure and endothermically reactive with carbon is introduced into the space between the zone of exothermic reaction and the wall of the reaction chamber; and by the fact that the gases containing carbon monoxide and hydrogen which are so produced are next brought into contact with distillation coke under high pressure.

Germany 835,492

**PROCESS AND INSTALLATION FOR THE PRODUCTION OF GAS FROM FINE-GRANULAR FUELS**

Otto Pistorius, Duisburg, and Wilhelm Flesch, Neckargemünd. Demag A.G., Duisburg, Germany

*Supplement to 829,483. Patented in the Federal Republic of Germany May 4, 1949.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of gas from fine-granular fuels in two generators or groups of generators, according to Patent 829,483; characterized by the direct transition from descending gasification to alternating ascending operation of the generators, and vice-versa, from operation on alternate sides to descending gasification.

Germany 837,279

**PROCESS FOR THE GASIFICATION OF FUELS UNDER PRESSURE**

Ernst Schmidt, Braunschweig, Germany

*Patented in the Federal Republic of Germany  
May 9, 1950.  
Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of fuels under pressure characterized by the fact that two or more gas producers with pressure rising in stages are connected one behind the other in such fashion that the gas produced in a gas producer with higher pressure is introduced to a gas producer at a lower pressure, after it has performed work in a pressure decreasing machine.

Germany 839,400

**PROCESS FOR THE PRODUCTION OF OIL-CARBURETED WATER GAS**

Carl Miedbrodt, Giessen, Germany

*Patented in the Federal Republic of Germany  
Dec. 20, 1950.  
Cl. 24e, Gr. 2*

The invention concerns a process for the production of oil-carbureted water gas in a water-gas installation operated with coke or coal periodically according to the reverse-flow process; characterized by the fact that during descending gasification, the water gas produced by such gasification is carbureted with oil in a supplementary, separately heated carburetion apparatus, while at the same time the water vapor required for the formation of water gas is highly superheated in the carburetion apparatus heated by the waste gases of the water-gas producer.

Germany 841,932

**DEVICE FOR THE CARBURETION OF WATER GAS**

Otto Pistorius, Duisburg. Demag A.G., Duisburg, Germany

*Patented in the Federal Republic of Germany  
Dec. 14, 1950.  
Cl. 24e, Gr. 2*

The invention concerns a device for the carburetion of water gas, characterized by the fact that conduction media for the production of a more or less spiral-shaped passage of the gas are provided in a carburetion chamber without lattice work.

Germany 842,823

**PROCESS AND INSTALLATION FOR THE PRODUCTION OF GAS FROM FINE-GRANULAR FUEL**

Otto Pistorius, Duisburg, and Wilhelm Flesch, Neckargemünd. Demag A.G., Duisburg, Germany

*Supplement to 829,483. Patented in the Federal Republic of Germany Mar. 29, 1949.  
Cl. 24e, Gr. 1*

The invention concerns a process for the gasification of fine-granular fuels in alternating operation of ascending and descending gasification along with preparation of the fuel bed by blowing-in of a gaseous medium in accordance with Patent 829,483; characterized by the fact that during the descending period, two generators work in parallel operation upon occasion, whereas during the ascending period they are alternately connected one behind the other.

Germany 844,952

**PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS**

Willy Linder, Essen. Heinrich Koppers G.m.b.H., Essen, Germany

*Patented in the Federal Republic of Germany  
Mar. 28, 1940.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production

of synthesis gas (water gas) with a high concentration of carbon monoxide and hydrogen and with a low hydrogen content and a high carbon monoxide content—for example, a gas in which there is an 85% CO and H<sub>2</sub> content and CO: H<sub>2</sub> in a proportion by volume of 2:3 to 3:2 through gasification of noncaking fuels by means of hot rinsing gases, which are moved in circulation through a gas producer and gas heaters connected thereto, whereby a part of the gases arising in the gas producer are introduced to the rinsing-gas circulation passage and the remainder are drawn off from the gas producer; characterized by the fact that, on the one hand, carbon dioxide or gases containing carbon dioxide in regulatable amounts are added to the rinsing-gas circulation passage before gas heating, and, on the other hand, the said carbon dioxide or gases containing carbon dioxide in regulatable amounts are added to the gas drawn off from the gas producer; that steam is removed by cooling from the mixture of the gases drawn off from the gas producer and of carbon dioxide; and that the mixture is finally heated to temperatures above 1,000°.

Germany 846,269

#### HIGH-PRESSURE GAS PRODUCER

Herbert Gruber, Essen. Heinrich Koppers G.m.b.H., Essen, Germany

Patented in the Federal Republic of Germany Apr. 4, 1951.

Gr. 3, Cl. 24e

The invention concerns a high-pressure gas producer the gasification shaft of which is formed of vertical pipes traversed by a cooling medium, characterized by the fact that the vertical pipes are so proportioned and arranged that they absorb the pressure which reigns in the reaction chamber; and that the reaction chamber; and that the reaction chamber is packed by means of an inner shaft casing which has only a limited wall strength, corresponding to the heat requirements.

Germany 846,759

#### PROCESS FOR THE GASIFICATION OF SOLID FUELS

Leo Mai, Mannheim, Germany

Patented in the Federal Republic of Germany Feb. 24, 1949.

Gr. 3, Cl. 24e

The invention concerns a process for the gasification of solid fuel, characterized by the fact that the exclusively pretrituated fuel is conveyed by means of a highly heated flow of gasification medium through a narrow pipe which empties from below into a gasification chamber, and is hurled against a collision plate arranged some distance in front of the outlet point of the pipe, which is flowed around by the fuel which, through friction and heating in the pipe and collision against the collision plate [the fuel] is trituated and hereby degasified and in part gasified, after which the said fuel is completely gasified in suspension in the gasification chamber, while the larger fuel pieces fall on the bottom of the gasification chamber, from which they are once more introduced to the pipe.

Germany 847,944

#### PROCESS FOR THE RINSING OF A WATER-GAS PRODUCER WHICH FUNCTIONS IN ALTERNATING OPERATION

E. H. Koppers, Essen. Heinrich Koppers G.m.b.H., Essen, Germany

Patented in the Federal Republic of Germany Dec. 12, 1940.

Gr. 1, Cl. 24e

The invention concerns a process for the rinsing of a water-gas producer which functions in alternating

operation after the end of the blowing cycle, with two flows of steam, the first of which is introduced below the grate, and the second above the fuel bed for the rinsing of the blowing-gas pipes; characterized by the fact that the rinsing steam introduced into the space below the grate is admitted from there through the slits in the grate and then laterally through the fuel bed into the annular-shaped ash pit at the periphery of the gasification shaft, and is taken off from there.

Germany 854,982

#### PROCESS FOR THE GASIFICATION OF FINE GRANULAR FUELS

Otto Pistorius, Duisburg. Demag A.G., Duisburg, and Wilhelm Fleisch, Neckargemünd, Germany

Patented in the Federal Republic of Germany Oct. 2, 1948.

Gr. 1, Cl. 24e

The invention concerns a process for the gasification of fine granular fuels in a gas producer with a quiescent fuel bed during the descending passage of the gasification process; characterized by the fact that the fuel bed is periodically set into a whirling up-and-down motion through the introduction of inert gases, in the course of which motion, large and/or specifically heavy components of the fuel bed, particularly the slag which is formed in the upper part of the bed during gasification, sink to the bottom, from which point they are removed from the gas producer.

Germany 847,945

#### PROCESS AND DEVICE FOR THE PRODUCTION OF FUEL GAS FROM HYDROCARBON OIL

Harry Brownley, New York, N.Y., U.S.A. Allied Chemical & Dye Corporation, New York, N.Y., U.S.A.

Patented in the Federal Republic of Germany July 26, 1950.

Gr. 3, Cl. 24e

The invention concerns a process for the production of fuel gas from hydrocarbon oil, characterized by the fact that steam is preheated in a heated, fireproof-material-containing zone or chamber, and from here flows upward into an empty reaction chamber which is kept at a temperature which vaporizes and partially cracks the hydrocarbon oil, and in which the hydrocarbon oil, in counter-flow to the steam, is atomized or sprayed downward; and by the fact that in this chamber substantially completely vaporized and partially cracked oil flows downward as a gaseous reaction mixture, into another wider reaction chamber, which is kept at a temperature which completes the cracking of the mixture; and by the fact that the mixture finally flows downward out of this chamber into a fourth chamber which contains fireproof, heat-storing material at a temperature which brings about the fixing of the gaseous reaction mixture.

Germany 859,191

#### PROCESS FOR THE PRODUCTION OF FUEL GASES, PARTICULARLY SYNTHESIS GASES, IN GAS PRODUCERS

Werner Altstaldt, Ludwigshafen am Rhein; Ernst Bartholomé, Ludwigshafen am Rhein; and Walter Knobloch, Mannheim-Feudenheim. Badische Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany

Patented in the Federal Republic of Germany Jan. 20, 1949.

Gr. 3, Cl. 24e

The invention concerns a process for the production of fuel gases, particularly synthesis gases, in gas producers, with the use of granular or pulverized fuels on the one hand, and fuel in pieces, particularly coke, coal or briquettes, on the other hand; characterized by the

fact that the granular or pulverized fuel is gasified in a gasifier, with liquidifying of the slag and the fuel in pieces in a runoff gas producer which may, if necessary, be provided with a distillation top piece; and the gases leaving the gasifier are passed through the runoff gas generator, so that their sensible heat is used to provide the heat requirement of the endothermic gasification in the latter.

Germany 861,898

**PROCESS FOR THE PRODUCTION OF WATER GAS FROM A MIXTURE OF FUELS AND ORES**

Ludwig Weber, Berlin-Wilmersdorf, Germany

*Patented in the Federal Republic of Germany*

*Oct. 27, 1940.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas from a mixture of fuels and ores, characterized by the fact that for purposes of simultaneous smelting, young, fine-grain fuels are carefully distilled, and closely mixed as well as briquetted with fine-granular ores, and by the fact that the briquettes are simultaneously smelted in a runoff gas producer and processed into water gas.

Germany 864,307

**PROCESS FOR THE PRODUCTION OF VALUABLE, COMBUSTIBLE GASES FROM HYDROCARBONS**

Willy Linder, Essen. Heinrich Koppers G.m.b.H., Essen, Germany

*Patented in the Federal Republic of Germany*

*Mar. 16, 1950.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the production of valuable, combustible gases containing hydrogen and carbon monoxide, through conversion of hydrocarbons with oxygen and steam (reactive media) along with use of a recovery system which is operated with alternating flow direction and which includes at least two recuperators (preheating accumulators) for the alternating preheating of the reaction media; characterized by the fact that additional heat is introduced to the hot mixture of hydrocarbons and preheated reaction media in order to complete the conversion process.

Germany 865,624

**PROCESS AND DEVICE FOR THE GASIFICATION OF SOLID FUELS**

Otto Hubmann, Bad Homburg, Metallgesellschaft A.G., Frankfurt am Main, Germany

*Patented in the Federal Republic of Germany*

*Nov. 8, 1941.*

*Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of solid fuels, especially with oxygen or with oxygen-enriched air and steam and/or carbon dioxide in two zones. One of the zones, in which the fuel first arrives, is operated at a high temperature, and the following one is operated at a lower temperature; characterized by the fact that in order to produce a gas rich in methane and carbon monoxide, especially in the case of gasification under pressure, the first zone is operated with a small addition of heat-absorptive steam or carbon dioxide, and the following zone is operated with a larger addition of the heat-absorptive media.

Germany 865,898

**PROCESS FOR THE PRODUCTION OF ALDEHYDES**

Ermbrecht Rindtorff, Wanne-Eickel, and Karl Schmitt, Herne. Bergwerks-Gesellschaft Hibernia A. G., Stickstoffwerk, Wanne-Eickel, Germany

*Patented in the Federal Republic of Germany*

*Mar. 12, 1944.*

*Gr. 7, Cl. 12*

The invention concerns a device for the production of aldehydes through catalytic conversion of hydrocarbons with ozonized oxygen or ozonized gases containing oxygen at a high temperature; characterized by the fact that in the presence of unsaturated hydrocarbons in the hydrocarbon-containing departure gases, the mixing chamber for the hydrocarbons and the ozonized gas is brought vertically directly over the contact oven entrance.

Germany 867,727

**PROCESS FOR THE COMPLETE GASIFICATION OF COAL**

Friedrich Domann, Berlin-Reinickendorf. Vereinigte Werkstätten Wittenau G.m.b.H. Berlin-Borsigwalde, Germany

*Patented in the Federal Republic of Germany*

*Feb. 16, 1951.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the complete gasification of coal, in which the coal is distilled by means of a partial flow of the gas produced from the gasification of the distillation residue, the said partial flow serving as a rinsing gas; the other partial flow of the gasification gas is separated from the mixture of rinsing gas and distillation gas and drawn off separately; the distillation and rinsing gas flow and the partial flow of drawn-off gasification gas, after removal of the tar and purification, are mixed with each other, and this mixture is introduced for the use of, for example, firing; characterized by the fact that in order to avoid the accumulation of distillation water, the purified, cooled partial flow of gasification gas which is drawn off separately from the mixture of rinsing gas and distillation gas, is brought to a temperature which, after the mixture of this partial flow with the mixture of rinsing gas and distillation gas from which the tar has been removed, results in a temperature of the entire gas mixture which is at least as much higher than the dew point of the entire gas mixture as the amount corresponding to the temperature drop in the piping to the point of use.

Germany 869,839

**PROCESS FOR THE PRODUCTION OF WATER-GAS FROM BITUMINOUS NON OR WEAKLY CAKING FUELS**

Franz Sabel, Trier. Badische Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany

*Patented in the Federal Republic of Germany*

*May 8, 1942.*

*Gr. 2, Cl. 24e*

The invention concerns a process for the production of virtually hydrocarbon-free water gas from bituminous, non or weakly caking fuels in gas producers with a distillation top piece in alternating operation of blowing and gasification without the use of circulating gases and with simultaneous obtaining of tar; characterized by the fact that distillation takes place in the distillation top piece of the gas producer, exclusively during blowing with the blowing gases arising in the lower part of the shaft, whereas during gasification, the steam, which is heated at least to the distillation temperature of the fuel—for example, to 700°—only flows through the lower part of the shaft from top to bottom, the said lower part being already charged with distilled fuel.

Germany 871,488

## PROCESS FOR THE CONTINUOUS PRODUCTION OF WATER GAS

Friedrich Domann, Berlin-Reinickendorf. Vereinigte Werkstätten Wittenau G.m.b.H., Berlin-Borsigwalde, Germany  
*Patented in the Federal Republic of Germany*  
 Apr. 22, 1951.  
 Gr. 2, Cl. 24e

The invention concerns a process for the continuous production of water gas by means of a heated circulating gas flow to which the gasification medium is mixed, characterized by the fact that the circulation gas is introduced to the gas producer simultaneously at two places located one above the other.

Germany 873,434

## PROCESS FOR THE GASIFICATION OF WEAKLY CAKING FUELS IN A RUNOFF GAS PRODUCER

Otto Zechetmayr, Oberhausen. Gutehoffnungshütte Oberhausen A. G., Oberhausen, Germany  
*Patented in the Federal Republic of Germany*  
 Feb. 20, 1951.  
 Gr. 3, Cl. 24e

The invention concerns a process for the gasification of weakly caking fuels, for example coal, with air, oxygen-enriched air, or oxygen, in a runoff gas generator, characterized by the fact that in the gas producer, between the uppermost fuel layer and the reduction zone, a cooling medium, for example water, or another vaporizing cooling medium, is introduced in such fashion that the temperature rise of the fuel from the uppermost layer up to the point of introduction of the cooling medium occurs more slowly, and from this point on to the reduction zone occurs more rapidly, and as a result, the fuel flows more rapidly through the temperature zone below the point of introduction of the cooling medium, where it tends to cake, than in a runoff gas producer without the introduction of a cooling medium.

Germany 879,139

## PROCESS FOR THE CONTINUOUS PRODUCTION OF FUEL GASES, PARTICULARLY WATER GAS, THROUGH THE GASIFICATION OF FUELS LOW IN CARBON

Hans Bähr, Herne-Sodingen. Badische Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany  
*Patented in the Federal Republic of Germany*  
 July 8, 1948.  
 Cl. 24e, Gr. 1

The invention concerns a process for the continuous production of fuel gases, particularly of water gas, through gasification of fuels low in carbon, with a carbon content of below 40%, appropriately from 5 to 20%, by means of oxygen and steam or carbon dioxide or mixtures of these; characterized by the fact that the gasification residues are permitted, by the use of high shaft ovens, to be collected into the mass in such fashion that their bed height amounts to at least 1 meter, and the bed is used for the preheating of the gasification media flowing through.

Germany 879,275

## PROCESS FOR THE GASIFICATION OR FOR THE DE-GASIFICATION AND GASIFICATION OF FUELS

Max Goebel, Bochum, and Rudolf Mewes, Bochum-Linden. C. Otto & Co. G.m.b.H., Bochum, Germany  
*Patented in the Federal Republic of Germany*  
 Apr. 20, 1950.  
 Gr. 3, Cl. 24e

The invention concerns a process for the gasification

or for the degasification and gasification of fuels in vertical ovens of advantageously lengthwise extended rectangular horizontal cross section through crossflow-rinsing, characterized by the fact that the rinsing and gasification media introduced into the upper part of the oven are more highly preheated than the media introduced into the lower part of the oven.

Germany 882,454

## PROCESS FOR THE GASIFICATION OF FINE-GRANULAR FUELS

Wilhelm Flesch, Heidelberg, and Fritz Winkler, Ludwigshafen am Rhein. Badische Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany  
*Patented in the Federal Republic of Germany*  
 Feb. 28, 1948.  
 Gr. 1, Cl. 24e

The invention concerns a process for the gasification of fine-granular fuels, characterized by the fact that oxygen-containing gasification media are blown from top to bottom through the fuel bed, and that the quiescent fuel bed, intermittently by interruption of the descending blowing, is brought into boiling motion in a known fashion through gasification media or fuel gases introduced from below, whereby the slag and ashes produced during descending blowing in the upper part of the fuel bed sink downward and are removed in a conventional manner from the gas producer.

Germany 883,317

## PROCESS FOR THE PRODUCTION OF FUEL GAS OF HIGH VALUE

Julius Schierenbeck, Heidelberg, Germany  
*Patented in the Federal Republic of Germany* Mar. 21, 1951.  
 Gr. 1, Cl. 24e

The invention concerns a process for the production of fuel gas of high value through gasification of solid fuels, particularly of bituminous coal; characterized by the fact that gasification is carried out in three zones which are differentiated from each other temperature-wise and procedurally (prereaction zone, postreaction zone, and distillation zone), and that the temperature in the prereaction zone and the distillation zone is adjusted through a circulation gas flow introduced into the prereaction zone and out of this zone into the distillation zone, and the temperature of the postreaction zone is adjusted independently from the said zone through heating or cooling, in such a way that in each zone the reaction and procedural conditions which are favorable for it are attained, and only distillation coke arrives into the postreaction zone.

Germany 885,587

## PROCESS FOR THE GASIFICATION OF FUELS

Otto Pistorius, Duisburg. Demag A.G., Duisburg, and Wilhelm Flesch, Neckargemünd, Germany  
*Patented in the Federal Republic of Germany*  
 Oct. 2, 1948.  
 Gr. 3, Cl. 24e

The invention concerns a process for the gasification of fuels in descending movement of the gasification medium, in which the fuel bed is prepared in brief intervening periods through the blowing in of gaseous media; characterized by the fact that during descending gasification, liquid or gaseous fuels are introduced to the gas producer.

Germany 890,696

**GAS PRODUCER FOR THE CROSSFLOW GASIFICATION OF ANTHRACITE OR DISTILLATION COKE**

Otto Winkelmann, Stuttgart-Degerloch. Daimler-Benz A.G., Stuttgart-Untertürkheim, Germany

*Patented in the Federal Republic of Germany Mar. 2, 1943.**Gr. 3, Cl. 24e*

The invention concerns a gas producer for the cross-flow gasification of anthracite or distillation coke, with an outlet pipe projecting as far as into the incandescent zone, or at least as far as in the vicinity thereof, in the hearth space, for the generator gas; characterized by the fact that the gas outlet pipe is built in the form of a truncated cone or pyramid tapering off counter to the incandescent zone.

Germany 893,115

**SHAFT FURNACE FOR THE CONTINUOUS PRODUCTION OF GAS FROM SOLID FUELS**

E. H. Heinrich Koppers, Essen. Heinrich Koppers G.m.b.H., Essen, Germany

*Supplement to Patent 734,365. Patented in the Federal Republic of Germany Aug 11, 1939.**Gr. 3, Cl. 24e*

The invention concerns a shaft furnace for the continuous production of gas from solid fuels, such as brown coal briquettes, or the like, in which the shaft rests on a bearing grate composed of cross-supports, which grate in turn is supported on vertical columns, and in which the lower shaft opening is encircled by reservoirs for the cooling of the residues to be brought out, whereby the cooling reservoirs form a part of the shaft bearing grate, in accordance with Patent 734,365; characterized by the fact that the cooling reservoirs which encircle the lower shaft opening on the lengthwise sides of the rectangular shaft part, are connected with cooling reservoirs which run perpendicular to them and which form the lateral sides of the shaft, which latter cooling reservoirs are inserted as independent construction parts between the bearing cooling reservoirs.

Germany 897,310

**PROCESS AND DEVICE FOR THE GASIFICATION OF FUELS**

Roman Rummel, Brühl bei Köln, Germany

*Patented in the Federal Republic of Germany**Dec. 7, 1948.**Gr. 3, Cl. 24e*

The invention concerns a process for the gasification of fuels in their own liquid slag, in which the slag is kept in liquid form by the flow energy of the gasification media introduced into it and of the fuel introduced separately from the gasification media, in circulating motion; characterized by the fact that, on the one hand, reactive gasification media are introduced to the slag circuit (the said media being reactive exothermically with the fuel and the slag), and, on the other hand, the fuel and if necessary gasification media reacting endothermically to the fuel are separated from each other locationwise and introduced to the slag circuit so that on one part of the circuit the fuel, while cooled and if necessary with reduction of the slag components, is degasified and partially gasified, and on the other part of the slag circuit the slag, and if necessary of the slag components, is heated anew, through oxidation of the fuel residues contained in it.

Germany 897,610

**PROCESS FOR THE PRODUCTION OF GASES**

Willy Linder, Essen. Heinrich Koppers G.m.b.H., Essen, Germany

*Patented in the Federal Republic of Germany**Apr. 17, 1951.**Gr. 2, Cl. 24e*

The invention concerns a process for the production of gases composed essentially of carbon monoxide and hydrogen and virtually free of hydrocarbons (tarry components), particularly for the synthesis of inorganic or organic materials, from bituminous coal in pieces; characterized by the fact that the fuel is gasified in a conventional type of shaft generator operating on the countercurrent principle, with a gasification mixture composed of oxygen and steam; and the gas mixture produced, which emerges from the shaft and is composed of gasification and degasification gas, is next heated in a recuperator system adjoining the gas producer to a temperature higher than the temperature of the disintegration of the tar-hydrocarbons into permanent gases, with steam and if necessary with oxygen.

Germany 899,540

**PROCESS FOR THE GASIFICATION OF FUELS**

Wilhelm Flesch, Heidelberg, and Fritz Winkler, Ludwigshafen am Rhein. Badische Anilin- &amp; Soda-Fabrik A.G., Ludwigshafen am Rhein, Germany

*Supplement to 882,454. Patented in Germany**Oct. 24, 1943.**Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of fuels, in which oxygen-containing gasification media are blown through the fuel bed from top to bottom, and the fuel bed is intermittently, with interruption of the downward blowing, brought into boiling motion by means of gasification media or fuel gases introduced from below, in accordance with Patent 882,454; characterized by the fact that large-granular fuels, or fuels in pieces, if necessary mixed with fine-granular fuels, are used as raw material.

Germany 899,541

**PROCESS FOR THE PRODUCTION OF NITROGEN-FREE SYNTHESIS GASES OF A UNIFORM COMPOSITION IN METALLURGICAL MELTING FURNACES**

Franz Sabel, Trier. Badische Anilin- &amp; Soda-Fabrik A.G., Ludwigshafen am Rhein, Germany

*Patented in the Federal Republic of Germany**Mar. 24, 1943.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of nitrogen-free synthesis gases of uniform composition in blast furnaces or similar metallurgical melting ovens, with the use of oxygen and other gasification media; characterized by the fact that the oxygen and other gasification media are jointly preheated in heat accumulators to 700°-1400°, whereby the quantity of oxygen introduced during the unit of time during the heat-releasing period of the heat accumulator is so increased in proportion to the dropping of temperature of the heat accumulator, that the sum of the sensible heat of the gasification media introduced to the furnace in the unit of time, and of the heat released during the conversion of the gasification media in the furnace in the unit of time shall remain approximately the same.

Germany 901,329

**PROCESS AND SHAFT FURNACE FOR OBTAINING GASES OF HIGH CALORIFIC VALUE FROM FUELS HIGH IN ASH**

Rudolf Mewes, Bochum-Weitmar, and Helmut Temme, Bochum. C. Otto &amp; Co. G.m.b.H., Bochum, Germany

*Patented in the Federal Republic of Germany Aug. 21, 1951.**Gr. 3, Cl. 24e*

The invention concerns a process for the obtaining of gases of high calorific value from fuels high in ash in a continuously operated vertical shaft furnace, characterized by the fact that the gasification medium containing both combined and uncombined oxygen, the said medium being highly heated, is introduced simultaneously at different levels into the descending fuel column, and the producer gas generated thereby is drawn off through outlet openings which are located at a level between the entry points of the gasification medium.

Germany 906,253

**WATER-GAS PRODUCER AND PROCESS FOR THE OPERATION THEREOF**

Alfred Schneemilch, Homberg, Demag A.G., Duisburg, Germany

*Patented in the Federal Republic of Germany Aug. 30, 1944.**Cl. 24e, Gr. 1*

The invention concerns a water-gas producer with a hot blowing space and a gasification space, through which the fuel is successively introduced; characterized by a vertical or almost vertical shaft with a charging device above and a device for discharging below for the supporting of a fuel column which remains in constant downward flow, into which at about the middle of the height of the shaft, the hot blowing draft and at the lower end of which the gasification steam are introduced, while the water gas and steam mixture is drawn off somewhat below the place where the hot blowing draft is introduced, so that the downward-moving fuel in the fuel column is hot blown in the upper part of the shaft and is gasified in the lower part of the shaft.

Germany 906,969

**PROCESS FOR THE PRODUCTION OF HEAVY GAS WITH A HIGH CALORIFIC VALUE BY THE GASIFICATION OF SOLID FUELS WITH OXYGEN**

Otto Hubmann, Bad Homburg, Metallgesellschaft A.G., Frankfurt am Main, Germany

*Patented in the Federal Republic of Germany Jan. 1, 1942.**Gr. 2, Cl. 24e*

The invention concerns a process for the production of heavy gas with a high calorific value by the gasification of solid fuels with oxygen under a pressure of several atmospheres; characterized by the fact that oxygen-containing gasification media, for example, mixtures of oxygen, steam and/or carbon dioxide and gas rich in hydrogen—for example, gas produced when the gasification medium is introduced and, under certain conditions, gas freed of steam and a part of the carbon dioxide—are introduced into the fuel bed of a gas producer in periodic alternation.

Germany 907,335

**PROCESS FOR THE PRODUCTION OF WATER GAS FROM BITUMINOUS, NONCAKING OR WEAKLY CAKING FUELS**

Franz Sabel, Trier. Badische Anilin- &amp; Soda-Fabrik A.G., Ludwigshafen am Rhein, Germany

*Supplement to 869,839. Patented in the Federal Republic of Germany Dec. 24, 1943.**Gr. 2, Cl. 24e*

The invention concerns a process for the production of virtually hydrocarbon-free water gas from bituminous, noncaking or weakly caking fuels, in accordance with Patent 869,839; characterized by the fact that during the blowing period, sufficient secondary wind is blown in approximately between the gasification part and the distillation shaft so that a part of the carbon monoxide contained in the blowing gases is consumed before entry into the distillation zone.

Germany 907,921

**PROCESS FOR THE GASIFICATION OF FUELS**

Wilhelm Fleisch, Heidelberg, and Fritz Winkler, Ludwigshafen am Rhein. Badische Anilin- &amp; Soda-Fabrik A. G., Ludwigshafen am Rhein, Germany

*Supplement to 882,454. Patented in the Federal Republic of Germany Oct. 26, 1943.**Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of fuels in which oxygen-containing gasification media are blown from top to bottom through the fuel bed and the quiescent fuel bed is brought into boiling motion intermittently, with interruption of the downward blowing, through gasification media introduced from below, in accordance with Patent 882,454, whereby, in addition to fine-granular fuel, large-granular fuel or fuel in pieces, if necessary mixed with fine-granular fuel, can be used as raw material; characterized by the fact that, before the fuel is introduced into the gas producer, the finest particles are removed and are used to heat the gasification media.

Germany 908,516

**PROCESS AND DEVICE FOR THE PRODUCTION OF FUEL GAS MIXTURES FROM FINE-GRANULAR FUELS**

Willem van Loon, Sittard, Netherlands. The Netherlands Government, represented by De Directie van de Staatsmijnen Limburg, Heerlen, Netherlands

*Patented in the Federal Republic of Germany Dec. 30, 1948.**Gr. 1, Cl. 24e*

The invention concerns a process for the production of fuel-gas mixtures from fine-granular fuels in two reaction rooms of unequal space content, the large reaction room having a space content many times greater than that of the smaller reaction room, and which are connected with each other in such fashion that the entire gaseous and solid reaction products of the smaller reaction room are introduced into the larger reaction room; characterized by the fact that in the smaller reaction room gasification takes place by means of an oxidizing gasification medium at a temperature above the fusion point of the slag; and by the fact that in the larger reaction room, the solid reaction products of the smaller reaction room, if necessary after admixture of raw fuel material, are brought to reaction at a lower temperature than in the smaller room, with a gasification medium; and the gas mixture produced is drawn off from the reaction room.

Germany 908,654

## PROCESS AND ARRANGEMENT FOR THE PRODUCTION OF GAS FROM FINE-GRANULAR FUELS

Otto Pistorius, Duisburg. Demag A. G., Duisburg, Germany

*Supplement to 842,823. Patented in the Federal Republic of Germany Aug. 7, 1949.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of gas from fine-granular fuels in generators which, during the descending period are assembled in parallel arrangement and during the ascending period are alternately connected one behind the other, with turbulence of the fuel through the blowing in of gaseous media in accordance with Patent 842,823; characterized by the fact that between the periods of turbulence of the fuel bed of the two generators, a period of hot blowing, particularly through blowing from top to bottom, is made to intervene.

Germany 911,886

## PROCESS FOR THE GASIFICATION OF FUELS

Wilhelm Flesch, Heidelberg, and Fritz Winkler, Ludwigshafen am Rhein. Badische Anilin- &amp; Soda-Fabrik A. G., Ludwigshafen am Rhein, Germany

*Supplement to 882,454. Patented in the Federal Republic of Germany Oct. 28, 1943.  
Gr. 1, Cl. 24e*

The invention concerns a process for the gasification of fuels in which oxygen-containing gasification media are blown from top to bottom through the fuel bed and the quiescent fuel bed is intermittently, with interruption of the downward blowing, brought into boiling motion through gasification media or combustion gases introduced from below, in accordance with Patent 882,454, whereby, in addition to fine-granular fuels, large-granular fuel or fuels in pieces are used, if necessary mixed with fine-granular fuels, as raw material, and/or, before introduction of the fuel into the gas producer, the finest particles are removed and can be used to heat the gasification media, and/or downward blowing can be carried out at a pressure higher than 0.5 atmosphere pressure above normal pressure; characterized by the fact that the gasification media during descending or ascending blowing are not only introduced from below and/or above, but also are laterally introduced.

Germany 912,385

## PROCESS AND DEVICE FOR THE PRESSURE GASIFICATION OF SOLID FUELS

Friedrich Danulat, Frankfurt am Main. Metallgesellschaft A. G., Frankfurt am Main, Germany

*Patented in Germany Oct. 18, 1941.  
Gr. 2, Cl. 24e*

The invention concerns a process for the pressure gasification of solid fuels by means of a mixture of oxygen and water vapor, characterized by the fact that in order to obtain the highest possible formation of methane under a given pressure, and therewith a good gas heating value, gasification is carried out in two zones superimposed above each other in such fashion that the lower zone is operated with liquid slag runoff and the upper zone with supplementary water vapor in order to bring about the most favorable gas synthesis.

Germany 912,612

## PROCESS AND GAS PRODUCER FOR THE PRODUCTION OF WATER GAS, PARTICULARLY SYNTHESIS GAS, ACCORDING TO THE GAS-CIRCULATION PROCESS

Franz Bieger, Essen, and Bernhard Arnolds, Hattingen. Braunkohle-Benzol A. G., Hanover-Kirchrode, Germany

*Patented in the Federal Republic of Germany Apr. 29, 1942.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of water-gas, particularly synthesis gas, from brown coal briquettes according to the gas-circulation process; characterized by the fact that, depending on the water content of the briquettes or changes in the condition of the gas producer resulting from the said water content—for example, flow resistance—carbon dioxide or gases rich in carbon dioxide, such as waste gas from the hydrocarbon synthesis from carbon monoxide and hydrogen, are for the time being introduced into the circulation gas circuit.

Germany 912,990

## PROCESS AND GAS PRODUCER FOR THE REMOVAL OF DUST FROM GAS AND THE RECOVERY OF FUEL DUST IN THE GASIFICATION OF FINE-GRANULAR FUELS

Ernst Senner, Frankfurt am Main, and Carl Miedbrodt, Giesen. Pintsch Bamag A. G., Berlin, Germany

*Patented in the Federal Republic of Germany Nov. 10, 1951.  
Gr. 1 Cl. 24e*

The invention concerns a process for the removal of dust from gas and for the recovery of fuel dust in the gasification of fine-granulated fuels in gas producers which gasify the fuel partially by descending gasification, and the fuel bed of which, for purposes of slag removal, is flowed through and sifted at two intervals by steam or gas directed upwards; characterized by the fact that the dust contained in the ascending flow is held back by granular, noncombustible bodies composing a filter, and is brought back over or into the fuel bed after being washed out of the filter by the ensuing descending flow of gasification medium.

Germany 913,810

## PROCESS FOR THE PRODUCTION OF VALUABLE COMBUSTIBLE GASES FROM HYDROCARBONS

Friedrich Hotezk, Essen, and Willy Linder, Essen. Heinrich Koppers G.m.b.H., Essen, Germany

*Supplement to 897,611. Patented in the Federal Republic of Germany Feb. 28, 1951.  
Gr. 3, Cl. 24e*

The invention concerns a process for the production of valuable combustible gases through conversion of hydrocarbons with oxygen and steam (reactive media), with the use of a recuperator system operated by alternating flow direction, which system includes at least two recovery units (preheating accumulators) for the alternating preheating of the reactive media, in which the hot mixture of hydrocarbons and reactive media has additional heat, produced through an exothermic reaction within the reaction space, introduced to it, in accordance with Patent 897,611; characterized by the fact that a part of the hydrocarbon to be converted is admitted, together with the reactive media, through the preheating accumulator, and the other part of the hydrocarbon is passed directly into the reaction chamber.



Germany 913,811

**PROCESS AND ARRANGEMENT FOR THE RUNNING OFF OF LIQUID SLAG FROM PRESSURE GAS GENERATORS**

Franz Sabel, Lottstetten bei Waldshut, Germany

*Patented in the Federal Republic of Germany*

Aug. 30, 1951.

Gr. 3, Cl. 24e

The invention concerns a process for the running off of liquid slag from pressure gas producers by means of a slag forehearth which is made pressureless during runoff; characterized by the fact that the transition duct for the liquid slag between the pressure gas producer and the forehearth is made to shut off before the molten slag is run off from the forehearth into the open air, by means of freezing up of the slag.

Germany 914,048

**PROCESS FOR THE PRODUCTION OF WATER GAS OR SYNTHESIS GAS**

Michael Steinschlaeger, London, England. Alfred William Newbery, Tongdean, Letchworth, Hertfordshire, United Kingdom

*Patented in the Federal Republic of Germany*

Sept. 30, 1950.

Gr. 1, Cl. 24e

The invention concerns a process for the production of water gas or synthesis gas in alternating operation, characterized by the fact that the heat required for the reaction with solid fuels in the gas producer, and for the compensation of heat losses, is obtained as follows: on the one hand, in part through the use of a recuperator which is heated through blowing gases or gas from a generator producer installation or from some other source, whereupon a mixture of water gas (recoil gas) with or without coke-oven gas or another gas rich in methane, or of a hydrocarbon-containing gas or of a gas composed of hydrocarbon or of steam and water vapor and/or carbon dioxide is passed through the aforementioned recuperator and then into the water-gas producer, whereby the mixture which runs through the recuperator is heated to a certain temperature; and on the other hand, in part through the fact that the gas producer is blown through from time to time with oxygen, air, or other oxygen-containing gases.

Germany 916,662

**PROCESS FOR THE PRODUCTION OF SYNTHESIS GASES OF HIGH CALORIFIC VALUE FROM FUELS RICH IN NONPARTICIPATING SUBSTANCES**

Fritz Leithe, Bochum, and Rudolf Mewes, Bochum-Weitmar. C. Otto &amp; Co. G.m.b.H., Bochum, Germany

*Patented in the Federal Republic of Germany*

May 18, 1951.

Gr. 1, Cl. 24e

The invention concerns a process for the production of synthesis gases of high calorific value from fuels rich in nonparticipating substances in continuously or half-continuously operating, vertical shaft furnaces; characterized by the following: (a) heating of the fuel rich in nonparticipating substances in the upper part of a vertical shaft furnace operating with cross-flow of the gasification medium through partial combustion by means of highly heated air, followed immediately by gasification in the lower part of the furnace through introduction of superheated steam; (b) separated off-take and utilization of the combustion gases produced in the upper part of the furnace for the heating of the preheater of the gasification medium; (c) transition of the gas containing carbon monoxide and hydrogen in the lower part of the furnace into the upper part (reduction zone) of a second crossflow furnace, through which an oxidic reaction mass is introduced in the cycle; (d) recovery of the reduced mass in the lower

part of the furnace (recovery zone) through introduction of superheated steam along with simultaneous formation of hydrogen; and (e) use of the end gases of the reduction and recovery zones for synthesis purposes, if necessary after removal of carbon dioxide and/or steam through rinsing or condensation, whereby the end gas of the reduction zone, which is rich in carbon monoxide and low in hydrogen, through the addition of the or a part of the end gas of the recovery zone, can be brought to the composition required for the hydrogen synthesis; or (f) use of the end gas of the recovery zone for ammonia synthesis and utilization of the end gas of the reduction zone for the heating of the preheaters of the gasification media.

Germany 917,806

**PROCESS FOR THE GASIFICATION OF GRANULAR TO PULVERIZED FUELS**

Wilhelm Flesch, Heidelberg. Badische Anilin- &amp; Soda-Fabrik A. G., Ludwigshafen am Rhein, Germany

*Patented in the Federal Republic of Germany*

Nov. 28, 1951.

Gr. 1, Cl. 24e

The invention concerns a process for the gasification of granular to pulverized fuels under ordinary or increased pressure in a gas producer with the fuel bed in a quiescent state during gasification with descending passage of the gasification medium (descending period), and periodic turbulation of the fuel bed through blowing in of the gasification medium from the bottom of the fuel bed (ascending period); characterized by the fact that the fuel to be gasified is passed into the gas producer at least in part during the descending period, in such fashion that it is distributed virtually uniformly over the surface of the quiescent fuel bed.

Germany 917,684

**PROCESS FOR THE CHARGING AND OPERATION OF GAS PRODUCERS OPERATING UNDER PRESSURE**

Rudolf Kranz, Mannheim. Brown, Boveri &amp; Cie. A. G., Mannheim-Käfertal, Germany

*Patented in the Federal Republic of Germany*

Dec. 5, 1944.

Gr. 3, Cl. 24e

The invention concerns a process for the charging and operation of gas producers operating under pressure, in which operation takes place periodically in such fashion that a short charging period follows in constant alternation on a longer period, during which the gas producer is held under pressure for the production of gas; characterized by the fact that during the shorter operation period, along with shutting off or throttling of the inlet of the gasification medium, particularly air, in other words, in a pressureless or diminished condition of the gas producer, additional fuel is brought into the gas producer and the ashes and the slag are carried out of the gas producer.

Germany 919,004

**PROCESS AND DEVICE FOR THE GASIFICATION OF GRANULAR FUELS**

Wilhelm Flesch, Heidelberg. Badische Anilin- &amp; Soda-Fabrik A. G., Ludwigshafen am Rhein, Germany

*Patented in the Federal Republic of Germany*

Nov. 10, 1951.

Gr. 1, Cl. 24e

The invention concerns a process for the gasification of granular, particularly of fine-granular fuels under ordinary or increased pressure in a shaft furnace, in which the fuels to be gasified are held in a bed in whirling motion through the ascending gasification media; characterized by the fact that the endothermic gasification media in the lowest part of the fuel bed

and the exothermic gasification media at a distance above them are introduced into the charge of fuel.

Germany 920,560

**PROCESS FOR THE PRODUCTION OF WATER GAS OR THE LIKE IN A HOT-BLOWING AND GASIFICATION PROCESS IN GAS PRODUCERS WITH PERIODICALLY AGITATED FUEL BED**

Otto Pistorius, Duisburg; Friedrich Johnswich, Essen-Steele; and Otto von Neudeck, Duisburg. Demag A. G., Duisburg, Germany

*Patented in the Federal Republic of Germany  
Oct. 5, 1951.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas or the like in a hot-blowing and gasification process in gas producers with one or several shafts, the fuel bed of which is periodically agitated through turbulence with inert gas or gasification medium; characterized by the fact that not only the gasification medium, but also the air used for hot blowing, are preheated by the blowing gases.

Germany 920,866

**PROCESS FOR THE DEGASIFICATION AND GASIFICATION OF SOLID FUELS**

Leo Mai, Mannheim, Germany

*Supplement to 846,759. Patented in the Federal Republic of Germany Feb. 11, 1950.*

*Gr. 3, Cl. 24e*

The invention concerns a process for the degasification and gasification of solid fuels, in which the fuel is moved through a narrow pipe (mixing pipe) emptying into a chamber, by means of a heated current of carrying gas, and is hurled against a collision plate

arranged a distance in front of the outlet of the mixing pipe, the said collision plate being flowed around by the fuel which is swept along by the flow of carrying gas and which is triturated by the friction and the heating in the mixing pipe and by the collision against the plate, which fuel is further treated in the chamber, while the large-size components fall back onto the bottom of the chamber, from which point they are once more passed to the mixing pipe, in accordance with Patent 846,759; characterized by the fact that the fuel is first dried and degasified in a first chamber (degasification chamber) with the use of an oxygen-free carrying-gas current, the temperature of which is below the temperature required for the conversion of hydrocarbons, and the distillation coke, or a part of such coke, swept along by the mixture of carrying gas and distillation gas is next separated from the gas mixture and is gasified in a second chamber (gasification chamber) under the use of an oxygen-containing, highly heated flow of carrying gas.

Germany 934,662

**PROCESS FOR THE PRODUCTION OF WATER GAS**  
Max Birkner, Köln-Dellbrück. Walther & Cie A.G., Köln-Dellbrück, Germany

*Patented in the Federal Republic of Germany  
June 11, 1944.  
Gr. 1, Cl. 24e*

The invention concerns a process for the production of water gas by means of a shaft, the sections of which are not separated by partition walls from each other, and to which sections air and steam are introduced in alternating succession; characterized by the fact that the switching over occurs in such a way that a gasifying section has two sections being blown through on each side of and adjacent to it.

# ITALIAN PATENTS

Italy 382,308

## PROCESS FOR THE CONTINUOUS PRODUCTION OF WATER GAS

Simon Schneider, Monaco

*Application filed Mar. 30, 1940; delivered Aug. 17, 1940.*

*Application 118,101 filed in Germany Apr. 1, 1939.*

*Cl. XVII*

The invention concerns a process for the continuous production of water gas from semicoke from bituminous lignites, the necessary reaction heat being introduced from outside through metal heating surfaces enclosing a space; characterized by the fact that the metal heating surfaces located in the oxidation zone are protected during the operation of combustion by means of a layer of neutral protective or reductive gas.

Italy 382,452

## PROCESS AND APPARATUS FOR THE TREATMENT OF FUELS IN GAS GENERATORS

René Bernard and Etienne Bernard, St. Nicolas Lez Liège, Belgium

*Application filed Apr. 13, 1940; delivered Aug. 23, 1940.*

*Application 433,865 filed in Belgium on Apr. 17, 1939.*

*Cl. XVII*

The invention concerns a process for the treatment of fuels in an inverse circulation gas generator, characterized by the coexistence in the latter of four separate reaction zones: one distillation zone, two combustion zones, and one reduction zone; arranged in such fashion that the reduction zone, from which the end gas is removed, is included between the two combustion zones; and by the fact that the temperatures existing there are sufficient to produce the pyrolysis of the distillation products and to assure fusion of the ashes.

Italy 384,203

## PROCESS FOR THE PRODUCTION OF GAS TO BE USED FOR SYNTHESSES, AND FURNACE FOR SAME

Ferdinando Fiorelli, Spoleto-Montepincio, Italy

*Application filed July 8, 1940; delivered Nov. 29, 1940.*

*Cl. XXIV*

The present invention concerns a process for the production of gas to be used for syntheses, of the formula CO plus H<sub>2</sub> or CO plus H<sub>2</sub> plus N<sub>2</sub>, virtually free of hydrocarbons, starting from fuels containing volatile materials; characterized by the fact that the fuel is gasified in a continuous form with a mixture of oxygen and steam, or oxygen, air and steam, in two gas generators connected in such fashion that the distillation gas developed in the upper part of the single apparatus is conducted alternately into the one or the other of them into the mass of coke at a high temperature, located above the gasification zone.

Italy 384,300

## INDUSTRIAL PROCESS FOR TRANSFORMING METHANE AND METHANIFEROUS GASES INTO MIXTURES OF HYDROGEN AND CARBON MONOXIDE BY MEANS OF HEATING WITH OXYGEN OR GAS CONTAINING FREE OXYGEN IN THE PRESENCE OF CATALYTIC MASSES

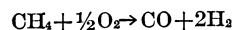
Carlo Padovani and Alberto Lotteri, Milan, Italy

*Application filed Aug. 8, 1940; delivered Dec. 9, 1940.*

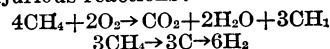
*Cl. XXIV*

The present invention concerns an industrial process for transforming methane and methaniferous gases

into mixtures of hydrogen and carbon monoxide by means of heating with oxygen or gas containing free oxygen in the presence of catalytic masses; characterized by the fact that the methane or the gas containing methane, before being introduced into the reaction chamber containing the reaction catalyzers, are mixed with at least one part of the oxygen needed for the reaction:



used by the process, and then made to pass through a preparation chamber presenting atmospheric conditions unfavorable to the above-cited reaction as well as to the injurious reactions:



and preheated in the said preparation chamber to a temperature of at least 550° C.

Italy 385,261

## GAS GENERATORS WITH DESCENDING GASIFICATION

Hansa-Gas-Generatoren G.m.b.H., Berlin-Reinickendorf, Germany

*Application filed Sept. 23, 1940; delivered Feb. 21, 1941.*

*Cl. XVII*

The invention concerns gas generators with descending gasification and fuel reservoir arranged connected to the firebox; characterized by the fact that the incomplete combustion gas and the vapors collected in the fuel reservoir are conducted into a special cycle in which, after they have been cooled and after the condensed precipitates have been eliminated, they are returned into the gas generator.

Italy 385,294

## PROCESS FOR THE PRODUCTION OF GAS, ESPECIALLY WATER GAS, THROUGH CHEMICAL SYNTHESSES IN GAS GENERATORS WITH A DISTILLATION CHAMBER SUPERIMPOSED THEREON

Vergasungs-Industrie A.G., Vienna, Austria

*Application filed June 15, 1940; delivered Feb. 22, 1941.*

*Application 35993 filed in Germany on June 17, 1939.*

*Cl. XXIV*

The invention concerns a process for the production of gas, especially water gas, in gas generators with superimposed distillation chamber; characterized by the fact that the principal quantity of the gasification agent, such as steam and oxygen or air, is introduced in a continuous manner into the zone of separation between the gasification shaft and the distillation chamber in several places on the circumference of the gas generator; and by the fact that the gas produced is discharged through one or more pipes traversing the fuel, the entry of which is lower than the place for admitting the gasification agent.

Italy 385,729

## PROCESS FOR USING LOST HEAT DEVELOPED DURING CATALYTIC OXIDATION WITHOUT PRESSURE OR UNDER THE PRESSURE OF CARBON MONOXIDE WITH WATER VAPOR

Bamag-Meguinn A. G., Berlin, Germany

*Application filed Nov. 6, 1940; delivered Mar. 18, 1941.*

*Application 189,116 filed in Germany Nov. 14, 1939.*

*Cl. XXIV*

The invention concerns a process for the utilization

of heat lost, which is formed during the catalytic oxidation carried out without pressure or under pressure of carbon monoxide with water vapor, through the saturation of the crude gas with water vapor in a saturator, arranging a circulation of hot water between the saturator and the cooler necessary for the cooling of the conversion gas containing water vapor; characterized by the fact that, in order to increase the use of the lost heat, the hot water which leaves the saturator is amply cooled by means of indirect cooling—for example, by means of a cooler with pipes—and then is used for the monophasic cooling of the conversion gas containing water vapor, and is successively utilized anew in the manner noted for the spraying of the saturator.

Italy 385,732

**FIXED GAS GENERATOR FOR THE PRODUCTION OF GAS FROM LIGNITES**

Giuseppe Bratto and Leone Trafieri, Siena, Italy

*Application filed Oct. 30, 1940; delivered on Mar. 18, 1941.*

*Cl. XVII*

The invention concerns a gas generator for the production of gas suitable for fueling the fireboxes of boilers and furnaces in general; characterized by the fact that it includes a combustion chamber encircled by an intervening space where the air for combustion is introduced; a grate with moveable bars designed to triturate the slag; a truncated conical ash pan and a moveable tank designed to close the ash pan hydraulically while the hot slag which has been triturated, falling in the water, produces steam which goes through the grate into the combustion zone and enriches the gas produced with hydrogen; means being arranged to regulate and channel the gas produced toward their point of utilization, and to channel the fumes toward the chimney.

Italy 385,919

**PROCESS AND INSTALLATION FOR THE DRY DISTILLATION OF LAMELLAR MATERIALS SUCH AS SCHIST**

Aktiebolaget Industrimetoder, Stockholm, Sweden

*Application filed Nov. 21, 1940; delivered Mar. 29, 1941.*

*Cl. XVII*

The present invention concerns a process for the dry distillation of lamellar materials—for example, schists—in which the materials to be distilled are made to advance by means of a conveyor device through a furnace—for example, a furnace with ducts—and the distillation gases are placed in circulation through the material by means of ventilators, in a substantially transverse direction with respect to the direction of location of the materials, and after each passage through the materials, they are indirectly heated with the aid of a heating device arranged in the furnace; characterized by the fact that the schist material to be distilled is charged into the conveyor device in such fashion as to cause the flat sides of the pieces of material to be arranged in a substantially horizontal position; and by the fact that the distillation gases are made to circulate through the material in a substantially horizontal direction in order to facilitate the passage of the gases through the material.

Italy 386,334

**DEVICE WITH PIPES FOR THE PROTECTION OF THE WALLS OF THE CHAMBERS FOR GASIFICATION, AND GAS GENERATORS AND SIMILAR INSTALLATIONS INCORPORATING SUCH A DEVICE**

Géza Szika and Arthur Rozinek, Budapest, Hungary

*Application filed Sept. 16, 1940; delivered Apr. 26, 1941.*

*Cl. XVII*

The invention concerns a gas generator or similar

installation in which the gasification of coal or coke in fine grains is effected in whole or in part in a state of suspension at a temperature above the fusion point of the slag; characterized by the use of pipes, which are arranged with intermediate spaces in such fashion that behind them is formed a refilling of coke and slag.

Italy 386,409

**FURNACE FOR THE LOW-TEMPERATURE TREATING OF MINERAL OR VEGETABLE CARBONACEOUS FUELS, SUCH AS COAL, LIGNITE, VEGETABLE RESIDUES, BITUMINOUS SCHISTS, AND THE LIKE**

Edoardo Michele Salerni, Rome, Italy

*Application filed Dec. 9, 1940; delivered Apr. 30, 1941.*

*Cl. XVII*

The present invention concerns a furnace for the low-temperature treating of carbonaceous mineral or vegetable materials such as coal, lignite, bituminous schist, vegetable residues, etc.; characterized by the fact that it includes troughs of a cylindrical shape, open above and equipped above with flanges connected in pairs in such fashion as to form channels open toward the bottom for the passage of the heating fluids.

Italy 386,577

**GAS GENERATOR WITH REVERSE FLAME FOR PRODUCING FUEL GASES FROM SOLID FUELS**

Galileo Guardabassi, Milan, Italy

*Application filed Dec. 6, 1940; delivered May 12, 1941.*

*Cl. XVII*

The present invention concerns a gas generator for producing fuel gas from solid fuels, including a hopper for charging the solid fuel, a combustion chamber, one or more air inlets, and a pipe for conveying the gas produced, the arrangement of the said parts being such that the gas produced during incomplete combustion of the solid fuels does not traverse the fuel still to be burned, but instead traverses only the part thereof which is in substantially horizontal combustion.

Italy 386,654

**PROCESS AND APPARATUS FOR THE FISSION OF METHANE AND OF HEAVY HYDROCARBONS BY MEANS OF OXYGEN IN THE PRESENCE OF RED-HOT COKE, FOR THE PRODUCTION OF GASES SUITABLE FOR CHEMICAL SYNTHESSES**

Luigi Marziani, Rome, Italy

*Application filed Oct. 29, 1940; delivered May 16, 1941.*

*Cl. XXIV*

The invention concerns a process for the fission of methane and heavy hydrocarbons by means of oxygen and in the presence of red-hot coke; characterized by the fact that the necessary consumption of the carbon contained in the coke takes place in part at the high temperature necessary for fission, and in part at a lower temperature, this second part also yielding a mixture of hydrogen and carbon monoxide, in such fashion that the slag resulting from the total combustion of the coke is of granular consistency and can easily be evacuated from the apparatus.

Italy 387,013

**GAS GENERATOR FOR SOLID FUELS, SUITED FOR THE FUELING OF FIREBOXES, OF FURNACES, AND OF BOILERS**

Ernesto Molteni, Milan, Italy

*Application filed Oct. 7, 1940; delivered June 14, 1941.*

*Cl. XVII*

The invention concerns a gasification combustor for all solid fuels, for the fueling, either directly connected to or connected at a distance from, by means of piping, with boilers, furnaces, and fireboxes of any type and for any use; characterized by a complex of functional

organs and accessories constructed and arranged in such fashion as to obtain distillation with pyrolysis of all the solid fuels, and the introduction of the gases produced, into the fireboxes for utilization at a very high temperature.

Italy 387,040

PROCESS FOR THE PRODUCTION OF HYDROCARBONS FROM SOLID FUELS BY MEANS OF GASIFICATION AND CATALYTIC TRANSFORMATION OF THE GAS OBTAINED

Metallgesellschaft A.G., Frankfurt am Main, Germany  
*Application filed Dec. 16, 1940; delivered June 14, 1941. Application 146,945, filed in Germany Jan. 26, 1940.*  
*Cl. XXIV*

The invention concerns a process for the production of hydrocarbons from solid fuels by means of gasification and catalytic transformation of the gas obtained, characterized by the fact that solid fuels are gasified with oxygen and water vapor at a pressure of several atmospheres, obtaining a gas containing methane (for example, over 8%); this gas is introduced, after separation of the toxic elements for the catalyzer and possibly the byproducts and the carbonic acid, into a contact furnace, and the residual unconverted gas is subjected to thermal dissociation with or without a catalyzer, the said residual gas containing a prevalence of methane and carbonic acid, after which the said residual gas is returned anew to catalytic transformation into hydrocarbons.

Italy 387,239

FURNACE SPECIALLY SUITED FOR THE DISTILLATION OF ASPHALTIC ROCK AND BITUMINOUS SCHISTS

Società Anonima Forni ed Impianti Industriali, Milan, Italy  
*First supplement to patent 349,341. Application filed Dec. 4, 1940; delivered June 25, 1941.*  
*Cl. XVII*

The invention concerns a furnace specially suited for the distillation of asphaltic rock and bituminous schists, in accordance with the principal Patent 349,341; characterized by the fact that it includes the means for introducing into the furnace a regulatable quantity of combustion air at a determined height above the grate.

Italy 387,372

PROCESS FOR THE PRODUCTION OF GASEOUS MIXTURES SUITABLE FOR THE SYNTHESIS OF HYDROCARBONS, AMMONIA, OR THE LIKE

Metallgesellschaft A.G., Frankfurt am Main, Germany.  
 Erich Brüggemann, Frankfurt am Main, Germany  
*Application filed Jan. 22, 1941; delivered July 8, 1941. Application 147,077 filed in Germany Feb. 10, 1940.*  
*Cl. XXIV*

The present invention concerns a process for the production of gases rich in hydrogen or rich in hydrogen and carbon monoxide, especially suited for the synthesis of hydrocarbons, ammonia, and the like; characterized by the fact that solid fuels are gasified by means of oxygen and water vapor and possibly carbonic acid under a pressure of several atmospheres, obtaining a crude gas rich in carbonic acid and methane and which gas is subjected, in order to transform the methane and possibly the carbonic acid, to a thermal treatment, possibly with the addition of water vapor or carbonic acid, or both.

Italy 387,664

FURNACE FOR LOW-TEMPERATURE DISTILLATION OF SOLID FUELS AND BITUMINOUS SCHISTS

Giordano Moscatelli, Genoa, Italy

*Application filed Oct. 21, 1940; delivered July 25, 1941.*  
*Cl. XVII*

The present invention concerns a furnace for the distillation at low temperatures of solid fuels or bituminous schists; characterized by the fact that it is constituted of a chamber with a circular shell inside of which the fuel or the bituminous schist is distributed in a continuous manner, which fuel or schist is distilled during its sojourn on the floor (which rotates in the chamber, advantageously heated in any appropriate manner), and is then discharged, distillation having taken place, after having traversed one complete rotation, toward an appropriate device.

Italy 388,001

PROCESS FOR THE DISTILLATION OF OILY SCHISTS OR SIMILAR BITUMINOUS FUELS WITH A HIGH ASH CONTENT

Alexander Schweitzer, Stuttgart, Germany

*Application filed Feb. 15, 1941; delivered Aug. 25, 1941.*  
*Cl. XVII*

The invention concerns a process for the distillation of oily schists and similar bituminous fuels with a high ash content, in a state of great height in furnaces with vertical or slanting shafts, or the like, burning the carbon by means of introducing air from above; characterized by the fact that preheating of the combustion air is partially or completely avoided by means of cooling the hot residues of combustion.

Italy 388,381

GAS PRODUCER WITH CONICAL GRATE AND WITH COMBUSTION PROCEEDING FROM TOP TO BOTTOM, FOR FUELS CONTAINING BITUMINOUS SUBSTANCES

Gustloff-Werke, Weimar, Germany

*Application filed Oct. 8, 1940; granted Sept. 19, 1941.*  
*Application 101,710 filed in Germany May 11, 1940.*  
*Cl. XVII*

The invention concerns a gas generator with combustion directed from top to bottom, in which the gas is exhausted from the firebox through a grate; characterized by the fact that the grate is essentially conical or pagodalike in shape, and its narrow end penetrates into the firebox.

Italy 388,773

GAS PRODUCER WITH DESCENDING FLAME FOR GENERATING GASEOUS FUELS FROM SOLID FUELS

Società Generale per l'Energia Termica Nazionale, Milan, Italy

*Application filed Feb. 21, 1941; granted Oct. 15, 1941.*  
*Cl. XVII*

The invention concerns a gas generator with descending flame for generating gaseous fuels from solid fuels, constituted of an external common iron wall and an internal wall also of common iron, separated by intervening spaces through which the gases produced pass, the said internal iron wall being internally lined with refractory material.

Italy 388,809

GAS GENERATOR FOR PRODUCING COAL GASES, INCLUDING THE MEANS FOR SUPPLYING PURIFIED COAL GAS

Gustavo Laureati, Porto San Giorgio, Italy

*Application filed May 9, 1941; granted Oct. 16, 1941.*  
*Cl. XVII*

The invention concerns a gas producer for produc-

ing coal gas, or other similar fuels, and the means for purifying the said gas prior to its utilization; in which a mass of coal is contained in a firebox [and fed] by way of a hopper; characterized by the fact that three nozzles are provided for supplying air (at a distance of 120° from each other), which nozzles enter the firebox and converge toward the center and are inclined toward the bottom, the gases produced being deviated into an intervening space through which they escape and go through filters, passing on to their utilization.

Italy 389,996

**PROCESS FOR THE PRODUCTION OF GAS STARTING FROM BITUMINOUS FUELS, AND GAS PRODUCER FOR THE CARRYING OUT OF THIS PROCESS**

Vergasungs-Industrie A. G., Vienna, Austria

*Application filed Mar. 25, 1941; granted Nov. 24, 1941.*

*Application 36,701 filed in Germany May 14, 1940.*

Cl. XVII

The invention concerns a process for the production of gas, especially gas for syntheses, through oxygen or air, starting from fuels in pieces; characterized by the fact that the gas coming from the degasification shaft is admitted as circulation gas through several nozzles distributed at the periphery of the gas producer in correspondence with the gasification zone of the gas producer; and by the fact that oxygen or air is mixed with the said circulation gas in correspondence to the admission places of the latter, in such fashion that the reaction of the oxygen or of the air with circulation gas takes place essentially at the point in which the circulation gas comes in contact with the fuel bed.

Italy 392,238

**GAS GENERATOR FOR LARGE-SCALE PRODUCTION OF PRODUCER GAS, WATER GAS, AND MIXED GAS FROM SOLID FUELS SUCH AS WOOD, PEAT, LIGNITE, AND FOSSIL FUELS AND SOFT COALS IN GENERAL, WITH GENERATOR EQUIPPED FOR AUTOMATIC FEED, AND CENTRAL FORCED DRAFT AND CENTRIFUGAL WATER PURIFIERS, AND VARIOUS APPLICATIONS IN GENERAL**

Mario Pedron, Treviso, Italy

*Application filed Oct. 1, 1941; granted Feb. 16, 1942.*

Cl. XVII

The present invention concerns a gas generator for large-scale production of producer gas, water gas and mixed gas from such solid fuels as wood, peat, lignite, fossil fuels in general, and soft coal; characterized by the special feature of having the generator fed from bottom to top by means of a horizontal screw and a vertical screw.

Italy 394,143

**FURNACE FOR THE LOW-TEMPERATURE TREATMENT OF CARBONACEOUS MINERAL OR VEGETABLE MATERIALS SUCH AS COAL, LIGNITES, VEGETABLE RESIDUES, BITUMINOUS SCHIST, AND THE LIKE**

Eduardo Michele Salerni, Rome, Italy

*First supplement to 386,409. Application filed Nov. 7, 1941; granted Apr. 21, 1942.*

Cl. XVII

The present invention concerns a furnace for the low-temperature treatment of carbonaceous mineral or vegetable materials such as coal, lignites, vegetable or mineral industrial residues, bituminous schists, and the like, in accordance with the principal Patent 386,409; characterized by the fact that the mixing spindles are so assembled that one part of them remains outside the units in which the passage of the material is effected, and the mixture thereof as well as the inside part operate intermittently.

Italy 396,118

**GAS GENERATOR WITH A SINGLE CHAMBER FOR THE PRODUCTION OF AN OIL GAS FREE OF TAR SUBSTANCES**  
Schmidt'sche Heissdampf G.m.b.H., Kassel-Wilhelmshöhe, Germany

*Application filed Jan. 9, 1942; granted June 29, 1942.*

*Application 121,744 filed Jan. 10, 1941.*

Cl. XVII

The invention concerns a gas generator with a single chamber or shaft; characterized by the fact that the slope of a steady slanted grate arranged below a constricting or throttling of the charging hopper is greater than the angle of flow of the fuel; and also by the fact that a steeply sloping wall in front of the steeply sloping grate is substantially parallel to the latter and extends to the height of the throttling or constriction point, while the draft pipe for the end gas is at the foot of the steeply sloping wall, in such fashion that the products of the distillation of the fuel are constrained to flow toward the bottom of the throttling of the charge hopper through the incandescent bed into the gasification chamber, and from here to the draft pipe prearranged in the steeply sloping wall.

Italy 396,368

**GAS PRODUCER, ESPECIALLY A DISTILLATION FURNACE WITH CENTRAL INTRODUCTION OF THE SCRUBBING GAS**

Karl Bergfeld, Berlin, Germany

*Application filed Dec. 31, 1941; granted July 14, 1942.*

Cl. XVII

The invention concerns a gas producer, especially a distillation furnace with central introduction of the scrubbing gas; characterized by the fact that the internal wall which limits the annular distillation chamber is composed of two cylindrical units superimposed on each other, of equal or practically equal cross section, the lower one of which serves for the introduction of the scrubbing gas, is hollow, and is provided with slits in the upper part; whereas the upper inactive distribution unit passes through the entire upper part of the distillation chamber.

Italy 396,731

**GAS PRODUCER WITH MULTIPLE COMBUSTION ZONE**  
Attilio Carlin, Pergine, Trento, Italy

*Application filed Oct. 14, 1941; granted July 24, 1942.*

Cl. XVII

The present invention concerns a gas producer for various applications and various fuels; characterized by the fact that it has one or more combustion zones, which are united with each other and individually fed by the appropriate introduction of comburent air.

Italy 397,891

**PROCESS AND APPARATUS FOR THE DISTILLATION OF BITUMINOUS SCHISTS, MINERAL OILS, AND CRUDE, IMPURE, RESIDUAL, AND FUEL OILS**

Giuseppe Bresciani, Bologna, Italy

*Application filed Apr. 11, 1942, granted Sept. 9, 1942.*

Cl. XVII

The invention consists of a process and apparatus for the distillation of bituminous schists, of mineral, crude, impure, residual, and fuel oils; characterized by the fact that the boiler and the distillation columns are totally protected throughout their entire external surface by a jacketing suitable for obtaining a higher calorific production.

Italy 401,262

## COAL GAS PRODUCER

Auguste Portier, Meyrin-Geneva, and Ernest Singy, Geneva, Switzerland

*Application filed July 7, 1942; granted Jan. 14, 1943. Application 65,311 filed in Switzerland July 11, 1941.*

Cl. XVII

The invention concerns a coal gas producer, characterized by the fact that its hearth is arranged in a chamber constituting an oven which does not communicate directly with the utilization zone, and includes at least one inlet for air under pressure designed to stimulate and activate combustion and distillation of the coal, with gasification being brought to completion by the radiant action of the walls on the hearth.

Italy 402,215

## GAS PRODUCER WITH DESCENDING FLAME FOR GENERATING GASEOUS FUELS FROM SOLID FUELS

Soterna Società Generale per le Industrie Minerarie Chimiche e Meccaniche, Milan, Italy

*First supplement to 388,773. Application filed Aug. 6, 1942; granted Feb. 23, 1943.*

Cl. XVII

The invention concerns a gas generator firebox with descending flame composed of a metal wall of a truncated cone shape, with the smaller base directed downward, inside of which there is installed a unit of a refractory material the external shape of which is also that of a truncated cone, and an internal shape resulting from the union through the smaller bases of the two truncated cones through a frustum of a cylinder.

Italy 402,379

## WATER GAS GENERATOR

I. G. Farbenindustrie A. G., Frankfurt am Main, Germany

*Application filed Oct. 2, 1942; granted Mar. 4, 1943. Application J-70574 filed in Germany Oct. 2, 1941.*

Cl. XVII

The invention concerns a water gas generator for alternating operation, in which the steam for cooling by blowing is conducted through the fuel bed from top to bottom; characterized by the fact that the grate is constructed like an accumulator of heat, which stores the sensible heat of the water gas which is generated during cold blowing, and which provides this heat for the entering air during hot blowing.

Italy 402,869

## PROCESS AND DEVICE FOR THE TOTAL CONTINUOUS GASIFICATION OF PULVERIZED SOLID FUELS OR ATOMIZED LIQUID FUELS

Luigi Patella, Milan, Italy

*Application filed Sept. 25, 1942; granted Mar. 27, 1943.*

Cl. XVII

The invention concerns a process for the total continuous gasification of pulverized solid fuel or atomized liquid fuels, characterized by the fact that combustion, after having been started in one or more burners through the pulverized fuel, in a proportionate mixture with the gasification medium, such as air, and oxygen, oxygen, oxygen and steam, etc., proceeds by catalytic means, both superficial and interstitial, in the presence of a refractory material in pieces and in particular in the presence of Raschig rings or similar type of refractory clay, sandstone, silica, sillimanite, corundum, carborundum, graphite and chromite, refractory iron, special types of wood, etc., thus obtaining the result that the relative velocity of the gasifying medium is raised and consequently the com-

bustion temperatures over the refractory Raschig rings are high, and there subsists, still through the presence of the Raschig rings, a favorable relative velocity between the gasification medium and the particles in process of reaction (oxidation and reduction), the difference of which occurs in the aforementioned gasification systems through suspension and agitation, where the said relative velocity assumes markedly low values.

Italy 404,028

## PROCESS FOR THE PRODUCTION OF A COKE WITH LOW ASH CONTENT, ESPECIALLY OF NONCAKING OR WEAKLY CAKING COALS

Zsigmond Gálocsy, Budapest, Hungary

*Application filed Sept. 2, 1942; granted May 18, 1943.*

Cl. XVII

The invention concerns a process for the production of a coke with low ash content, especially of noncaking or weakly caking coals, characterized by the fact that the granular or pulverized coke obtained from coking of the coal is subjected, as an intermediate product, to a process of diminution of the ash by a known process, there being thus obtained a part of the coke which has a low ash content and a part with a high ash content; and by the fact that the part of the coke which has a low ash content, after the addition thereto of organic binding substances and after advantageous reduction to briquettes, is once more subjected to coking.

Italy 405,772

## GASIFIER FOR SOLID FUELS WITH AN EJECTOR-MIXER INCORPORATED IN IT

Eugenio Seren Rosso, Biella, Italy

*Application filed Mar. 10, 1943; granted Sept. 7, 1943.*

Cl. XVII

The invention concerns a gasification apparatus for solid fuels, characterized by the fact that it unites in a single unit a reverse combustion gas generator and an ejector-mixer of the gas.

Italy 406,448

## GAS GENERATOR WITH CHAMBERS FOR TREATMENT AFTER GASIFICATION, ARRANGED UNDER THE INCANDESCENT NUCLEUS

Johann Wagner, Deggendorf, Germany, and Hans Schnell, Monaco

*Application filed Apr. 3, 1943; granted Nov. 24, 1943.*

Cl. XVII

The invention concerns a gas generator with treatment chambers after gasification arranged in series below the incandescent nucleus; characterized by chambers, which are basically open and by a spiral duct united to them, which encircles the incandescent nucleus and these chambers, which are arranged and interconnected in such fashion that there is continuous transportation of ascending and descending gas.

Italy 407,228

## GAS GENERATOR WITH REVERSE FLAME AND MULTIPLE ZONES FOR THE REDUCTION AND PYROFISSION OF THE GASES, FOR THE GASIFICATION OF FOSSIL AND OF VEGETABLE FUELS

Ghelfi Salvatore, Milan, Italy

*Application filed Mar. 31, 1943; granted Sept. 25, 1944.*

Cl. XVII

The present invention concerns a gas generator with reverse flame and multiple zones for the reduction and pyrofiSSION of the gases; characterized by the fact that the first pyrofiSSION organ is a conical grate concentric to the outlet pipe of the gases from the firebox, and equipped with a threaded shank fixed to the ash-discharge door, which permits of regulating it into the

appropriate position for the type of fuel used; and that the generator has a cylindrical jacketing arranged inside the firebox in such fashion as to constitute an annular chamber or chambers, the last two permitting greater contact of the gases with the vegetable carbon contained therein in order to complete the reduction and pyrolysis of the gases, whereas the single annular chamber permits the gases also to come in contact against the red-hot wall of the firebox, and affording a means of completing pyrolysis of the tar vapors.

Italy 407,726

EXHAUST GAS GENERATOR

Ernst Güssow, Berlin, Germany

*Application filed Oct. 27, 1942; granted Nov. 15, 1944.*  
Cl. XVII

The present invention concerns a process for the gasification of fuels, characterized by the fact that at a uniform distance from the fire zone, inside a constriction of the cross section of the retort, water vapor is introduced into the entire space of the latter as a second gasification medium.

Italy 408,697

GAS PRODUCER

Mühlenbau und Industrie A. G., Braunschweig, Germany  
*Application filed June 4, 1943; granted Jan. 7, 1945.*  
Cl. XVII

The invention concerns a gas generator for the gasification of solid fuels, in which the comburent air is conducted into the gasification chamber through a moveable feed pipe, axially located; characterized by the fact that the said feed pipe is arranged so as to be moveable and has an organ for the outlet of the comburent air in a radial direction.

Italy 408,699

GAS GENERATOR ADAPTED FOR OPERATING WITH WOOD OR WITH CHARCOAL

Fernando Cenna, Milan, Italy

*Application filed June 4, 1943; granted Jan. 7, 1945.*  
Cl. XVII

The invention concerns a gas generator suitable for operating with wood or with charcoal, characterized by the fact that it can operate either with direct flame through fueling with charcoal, and with reverse flame through wood fueling.

Italy 408,900

PROCESS FOR CONTINUOUS DISTILLATION OF BITUMINOUS SCHISTS AND FURNACE FOR CARRYING OUT THIS PROCESS

Neri Sizzo and Luigi Ottolini, Melide, Switzerland

*Application filed June 14, 1943; granted Jan. 13, 1945.*  
*Application 81,077 filed in Switzerland Apr. 1, 1943.*  
Cl. XIV

The invention concerns a process for the continuous distillation of bituminous schists, utilizing a furnace including a series of distillation retorts connected by at least one common pipe to condensation apparatus; characterized by the fact that the various retorts are successively charged and discharged one after the other, isolating the retort which is being charged or discharged from the common pipe and from the other retorts without interrupting the connection of the latter with the condensation apparatus, in order to permit uninterrupted operation of the furnace during the isolation of any one given retort.

Italy 409,983

GAS GENERATOR FOR GASIFYING WOOD, WITH GENERATOR INCORPORATED INTO A MULTIPLE FILTRATION UNIT

Giuseppe Bava, Alpignano, Italy

*Application filed Aug. 2, 1943; granted Mar. 14, 1945.*  
Cl. XVII

The invention concerns a gas generator for gasifying wood with generator incorporated into a filtration unit for automotive vehicles and the like; characterized by the fact that the gas generator proper, together with the firebox proper, is completely enclosed in a unit containing the complex of filters, in such fashion as to constitute a single unit easy to install, to overhaul, and to assemble.

Italy 412,160

ELECTRIC FURNACE FOR THE INTEGRAL GASIFICATION OF FUELS

Vittorio Rosso and Cesare Augusto Possenti, Vercelli, Italy  
*Application filed Aug. 20, 1945; granted on Nov. 2, 1945.*  
Cl. XVII

The present invention concerns an electric furnace for the integral gasification of fuels, characterized by the fact that it is fueled in a continuous manner and that, in addition to producing the joint distillation of the fuels, which distillation gives rise to permanent fuel gases and to condensable vapors, it is set up in such a way that it converts the aforementioned vapors into permanent fuel gases and at the same time also gasifies the fixed carbon of the fuels themselves, converting the said carbon into water gas through the action of the superheated water-vapor over incandescent carbon.

Italy 415,878

GAS PRODUCER WITH AN INCOMPLETE COMBUSTION AND DISTILLATION CHAMBER AND AN UNDERLYING SEMICLOSED OPENING CONSTITUTED BY AN EXTENSION, IN THE SHAPE OF A TRUNCATED CONE, OF THE DIABOLO, IN ORDER TO INTENSIFY THE OPERATION OF THE GAS PRODUCER

Carmine Piragino, Genoa, Italy

*Application filed Feb. 5, 1946; granted Nov. 7, 1946.*  
Cl. XVII

The invention consists of a gas producer with an incomplete combustion and distillation chamber and underlying semiclosed opening, characterized by the fact that the *diabolo*, composed—as noted—of two truncated cones connected by their lesser bases, is extended downward by means of a subsequent truncated cone which is connected by means of its larger base to the lower mouth of the *diabolo*.

Italy 420,669

IMPROVEMENT IN THE DISTILLATION OF BITUMINOUS SCHISTS

Société Schistes, Carburants et Lubrifiants, Paris, France

*Application filed Jan. 16, 1946; granted May 2, 1947.*  
*Application filed in France June 30, 1943.*  
Cl. XVII

The invention concerns an improvement in the distillation of schists, after mixture and digestion with an agent for digesting bitumens, which improvement includes one or more of the following characteristics:

(1) The result of the distillation is influenced by selecting the temperatures between which the oil which serves as a digestive agent is distilled;

(2) Distillation occurs between temperatures which are less elevated to the extent that it is desired to collect liquid and less gaseous products;

(3) The non-condensable gases are returned to the distillation cycle;



(4) The mixture of schist and a digestive agent is prepared and possibly subjected to digestion in a mixer of any appropriate type, separate from the furnace.

Italy 420,854  
GAS PRODUCER OPERATING WITH WOOD OR ANOTHER  
SOLID TYPE OF FUEL

Paul Cesbron, Chemillé, France

*Application filed Dec. 9, 1941; granted May 9, 1947.*  
*Application 868,089 filed in France Dec. 13, 1940.*

Cl. XVII

The invention concerns a gas producer of the inverse combustion type, and in which any type of solid fuel, even very moist, is used; characterized by the fact that the upper part of the fuel receiver is connected with a condenser-cooler for the water vapor and the products of burning wood (especially tars and pitches), the noncondensable products swept along with the said products being separated and reintroduced into the fuel receiver somewhat above the nozzles.

Italy 420,900  
IMPROVEMENT IN THE APPARATUS FOR THE PRODUCTION OF GAS EQUIPPED WITH ROTATING GRATES  
West's Gas Improvement Co., Ltd., Manchester, United Kingdom

*Application filed Oct. 2, 1946; granted May 9, 1947.*  
*Application 383 filed in Great Britain Jan. 4, 1945 in the names of Frederick Jos. West, Ernest West, and the applicant.*

Cl. XVII

The present invention concerns an apparatus for the production of gas having its grate in the form of a perforated screw or a spiral supported inside the cylindrical casing and made to move by the latter; characterized by the fact that the said casing is made to rotate with appropriate means in such fashion as to cause the grate to rotate, while the latter is laterally held back by rollers and a wheel on rollers, and while there is a water-closure joint between the upper part of the casing and the bottom of the production apparatus.

Italy 421,845  
IMPROVEMENTS IN CONTINUOUS FURNACES DESIGNED FOR THE CARBONIZATION OF SOLID FUELS FOR THE PRODUCTION OF A GAS RICH IN HYDROGEN

Compagnie Générale de Construction de Fours, Montrouge, France

*Application filed Feb. 23, 1942; granted June 3, 1947.*  
*Application filed in France on Feb. 25, 1941.*

Cl. XVII

The invention concerns a chamber or retort for furnaces for the carbonization of solid fuels for the production of a gas rich in hydrogen and/or carbon monoxide; characterized by the fact that the solid fuel advances continuously during the course of gasification and this advancement takes place from top to bottom by means of gravity.

Italy 422,460  
LOW-TEMPERATURE CARBONIZATION FURNACE  
Georges Jarry, Sens, France

*Application filed Mar. 6, 1943; granted June 18, 1947.*  
*Application 880,222 filed in France Mar. 14, 1942.*

Cl. XVII

The present invention concerns a carbonization furnace operating at low temperature, with a fixed horizontal retort, characterized by the fact that (1) The special shape of the retort, the frontal section of which includes a circular portion surmounted by an oval elongated part, which encloses, along the upper part of the retort, a chamber or passage for the circula-

tion therein of the volatile products of carbonization, evacuation of the said products being thus assured without any hindrances.

Italy 423,065  
PROCESS AND DEVICE OF AN INSTALLATION SUITABLE FOR THE PRODUCTION OF PURE HYDROGEN FROM PRODUCER GAS WITH THE USE OF COLUMNS WITH MULTIPLE REFLUX DEVICES ABOVE ALTERNATING PLATES

Pietro Edoardo Renato Marcon, Padua, Italy

*Application filed Nov. 17, 1942; granted July 3, 1947.*  
Cl. XXIV

The invention concerns an installation and a process for the production of pure hydrogen from producer gas with the insertion into the production circuit of columns with multiple reflux devices over alternating plates, with the special objective of utilizing for the said production, poor fuels (lignites, peat, etc.), or industrial waste which do not lend themselves to the development of water gas, for all the applications of hydrogen and particularly referring to the application of hydrogen produced for ammonia synthesis.

Italy 423,391  
PROCESS FOR UNDERGROUND GASIFICATION, CONSISTING OF CONDUCTING COMBURENT GAS TO A FUEL BED IN IGNITION

Pierre Demart, Brussels, Belgium

*Application filed Oct. 9, 1946; granted July 14, 1947.*  
*Application 458,265 filed Feb. 28, 1945 in Belgium.*  
Cl. XVII

The present invention concerns a process of underground gasification, in which comburent gas is conducted to a fuel bed in ignition; characterized by the fact that the fall of the arching roof over the bed in ignition is regulated, thus influencing the temperature of the forepart in ignition formed by the said fuel bed in ignition.

Italy 425,190  
PROCESS FOR THE TOTAL GASIFICATION OF FUELS IN GENERAL IN CLOSED VESSELS

Vittorio Rosso, Vercelli, Italy

*Application filed Nov. 30, 1944; granted Sept. 13, 1947.*  
Cl. XVII

The invention concerns a process of total gasification of combustible substances, characterized by the fact that it is effected in closed vessels, subjecting the substance to high temperature, driving the gases and vapors formed through the incandescent mass of coke which is residual from the foregoing operation, which brings about the pyrolysis of the condensable materials; with injection of water vapor, the fixed carbon is immediately gasified, facilitating the reactions through appropriate catalyzers, according to the nature of the substances to be gasified.

Italy 426,163  
GAS PRODUCER WITH REVERSE FLAME FOR THE GASIFICATION OF FOSSIL OR VEGETABLE FUELS, WITH AIR ORIFICE WITH A CONTINUOUSLY MOVING GRATE, FOR THE RAPID EXTRACTION OF THE MOLTEN ASHES

Salvatore Ghelfi, Milan, Italy

*Application filed Mar. 23, 1944; granted Oct. 22, 1947.*  
Cl. XVII

The subject of the present invention is a gas producer with reverse flame for the gasification of fossil and vegetable fuels, with air orifice with continuously moving grate, for the rapid extraction of the molten ashes; characterized by the fact that a grate encircles the entire internal wall of the hearth in such fashion as to establish an igneous lining around the entire pe-

riphery of the said hearth, and is formed of various elements distributed through a pipe, the extraction of all the slag and ashes fused corresponding to the grate during combustion being effected through the element corresponding to the said pipe.

Italy 426,596

**PROCESS AND INSTALLATION FOR UNDERGROUND GASIFICATION FOR THE PRODUCTION OF FUEL GAS**

Pierre Demart, Brussels, Belgium

*Application filed Oct. 9, 1946; granted Oct. 29, 1947.*

*Application 455,627 filed in Belgium May 5, 1944.*

Cl. XVII

The invention concerns a process and installation for underground gasification, in which the comburent gas is introduced to a fuel-bed in ignition by passages including a shaft and at least one gallery; characterized by the fact that a conduit is provided for the evacuation of the gases produced, which conduit is arranged in the admission passages of the comburent gas.

Italy 426,989

**GAS PRODUCER WITH REVERSE FLAME, WITH HEARTH HAVING CLEARLY SEPARATED ZONES FOR THE COMBUSTION AND REDUCTION OF GASES, PARTICULARLY SUITED TO THE GASIFICATION OF FOSSIL AND VEGETABLE FUELS CONTAINING A HIGH PERCENTAGE OF TARS**

Paride Sacchi, Milan, Italy

*Application filed Nov. 7, 1944; granted Nov. 10, 1947.*

Cl. XVII

The invention concerns a gas producer with reverse flame with hearth having clearly separated zones for the combustion of gas, particularly suited to the gasification of fossil and vegetable fuels with a high tar content; characterized by the fact that the hearth is formed of two separate parts—namely, a truncated conical section with an outlet orifice which, together with a nozzle, constitutes the combustion zone solely for the production of CO<sub>2</sub>, and a cylindrical wall integral with the preceding wall, which forms a chamber by means of a grate, in order to contain the fuels at a high temperature and for the reduction of the CO<sub>2</sub> into CO.

Italy 428,883

**GAS PRODUCER WITH DIRECT COMBUSTION AND INVERTED GAS FLOW**

Lino Bianchi, Mandello del Lario, Como, Italy

*Application filed Feb. 9, 1945; granted Jan. 8, 1948.*

Cl. XVII

The present invention concerns a gas producer with direct combustion and inverse flow of gas, characterized by the fact that a unit without a bottom is arranged inside the outer shell of the gas producer in such fashion that the lower end is at a lower level with respect to that of the hearth, thus giving rise to an inverting of the gas arising from the latter in a downward direction, in order to expose the said gas flow, in the zone in which the conversion of the carbon dioxide into carbon monoxide takes place, as long as possible to the direct action of heat.

Italy 429,836

**FURNACE FOR THE DISTILLATION OF FUELS WITH VERTICAL CHAMBERS OPERATING INTERMITTENTLY**

Società Anonima Forni ed Impianti Industriali Ingg. De Bartolomeis, Milan, Italy

*Application filed Jan. 9, 1947; granted Feb. 5, 1948.*

Cl. XVII

The present invention concerns a furnace with vertical chambers operating intermittently, for the distil-

lation of fuels in accordance with the principal Patent 384,387, in the event that the gas producer should be incorporated in the walls of the furnace; characterized by the fact that the chamber of the gas producer communicates with a collecting pipe which extends frontally to the abutments of the furnace and from the base of which, ascending pipes depart, each of which terminates in the burner of an abutment.

Italy 430,009

**METHOD FOR PRODUCING HYDROGEN BY THE CONVERSION OF CARBON MONOXIDE WITH STEAM**

American Magnesium Metals Corporation, Pittsburgh, Pa., U.S.A.

*Application filed Aug. 27, 1946; granted Feb. 6, 1948.*

*Application 22,093 filed in Great Britain Aug. 28, 1945.*

Cl. XXIV

The present invention concerns a method for producing hydrogen by converting carbon monoxide (carbon protoxide CO) or gaseous mixtures containing carbon monoxide with steam, with the use of catalytic masses including an agglomerated mixture or in the form of brickwork containing at least one of the materials contained in each of the following groups:

- (a) Amorphous carbon;
- (b) One or more of the magnesium hydroxides, calcium, strontium, barium and beryllium;
- (c) Alkaline hydroxides or carbonates.

Italy 430,889

**UNDERGROUND GASIFICATION INSTALLATION, SUITABLE FOR THE PRODUCTION OF FUEL GAS**

Pierre Demart, Brussels, Belgium

*Application filed Nov. 15, 1946. Granted Feb. 20, 1948.*

*Application 456,218 filed in Belgium June 10, 1944.*

Cl. XVII

The present invention concerns an installation for underground gasification, characterized by the fact that it includes a gasification zone delimited by embankments which substantially enclose it completely; at least one ignition zone located at the lower part of the said gasification zone; inlets for the passage of the comburent gas emptying into the upper part of the latter, preferably rather distant from the said ignition zone; means for compressing the air toward the said ignition zone; and passages for the evacuation of the gases produced, starting from the lower part of the gasification zone and emerging toward the surface, starting from a point in the said lower part, preferably rather distant from the said ignition zone.

Italy 435,357

**PROCESS FOR THE GASIFICATION OF CARBONACEOUS MATERIALS IN A CONTINUOUSLY OPERATING INSTALLATION**

Carlo Koller and Francesco Esztergaly, Budapest, Hungary

*Application filed Sept. 16, 1947; granted May 17, 1948.*

*Application K.16,150 filed in Hungary Oct. 26, 1942.*

Cl. XVII

The invention concerns a process for the gasification of carbonaceous materials in a continuously operating installation; characterized by the fact that the conversion into gas is effected by means of a gaseous agent containing combined oxygen—free oxygen being practically excluded—in a magnetic field and in such fashion that the heat required for the conversion is supplied by heat generated by electric induction.

Italy 435,648

**GAS PRODUCER WITH REVERSE FLAME FOR THE GASIFICATION OF FOSSIL OR VEGETABLE FUELS, WITHOUT THE SUBSIDIARY VEGETABLE CARBON ZONE FOR THE REDUCTION OF THE CO<sub>2</sub> AND THE PYROFISSION OF THE TARRY VAPORS**

Salvatore Ghelfi, Milan, Italy

*Application filed Dec. 9, 1944; granted May 21, 1948.*  
*Cl. XVII*

The invention concerns a gas generator with reverse flame for the gasification of fossil and vegetable fuels without the subsidiary vegetable carbon zone for the reduction of the carbon dioxide and the pyrofiSSION of the tarry vapors, according to the principal Patent 411,281; characterized by the fact that downwards from the zone of influence of the air distributed by a nozzle or nozzles, there is provided a means of arresting the fuel, for example a plate, or the like, inserted in order to cause the fuel to remain in the said zone as long as possible and to provide for perfect combustion of the fuel, even if the latter has a high moisture content, the said plate, or equivalent means, being equipped with at least one opening of an appropriate diameter for the passage of the fuel into the firebox.

Italy 436,897

**DEVICE FOR THE PREPARATION OF OIL GAS OR GAS FROM TAR OR BITUMINOUS SCHISTS**

Domenico Odasso and Pio Mascardi, Genoa-Sestri Ponente, Italy

*Application filed Jan. 26, 1948; granted on June 16, 1948.*

*Cl. XVII*

The invention concerns a device for the preparation of oil gas or gas from tar or bituminous schists, characterized by the fact that it is composed of a receptacle arranged in the manner of a bain-Marie (double-boiler), in which the tar to be gasified is deposited, the said receptacle being in turn housed in a furnace divided into two parts, the upper part of which operates as a boiler and the lower as a furnace properly speaking.

Italy 439,334

**INSTALLATION FOR THE CONVERSION OF WATER GAS**  
Montecatini Società per l'Industria Mineraria e Chimica, Milan, Italy

*Application filed Nov. 15, 1947; granted Sept. 16, 1948.*

*Cl. XXIV*

The present invention concerns an installation for the conversion of water-gas, characterized by the fact that the catalytic converter is arranged immediately downward from the gas generator, the only interposed object being an apparatus for separating the dust.

Italy 440,935

**MECHANICAL ROTATING GRATE FOR THE GASIFICATION OF ALL TYPES OF SOLID FUELS**

Gustavo Lauro, Milan, Italy

*Application filed Apr. 24, 1945; granted Oct. 22, 1948.*

*Cl. XVII*

The present invention concerns a grate for a solid fuel gas generator, characterized by the fact that in its central part, supporting the fuel, a hollow unit is constituted which is suitable for producing steam mixed with air to feed a gasification zone above it, and another one which is laterally beneath it, which, in its turn, is fed by a mixture of air with steam generated by the surplus water from the hollow unit, along the

sides of the central unit for cooling and wetting the slag, and by the steam arising from the evaporation of the water above the basin for collecting the ashes.

Italy 441,357

**PROCESS FOR UNDERGROUND GASIFICATION**

Pierre Demart, Brussels, Belgium

*Application filed Sept. 8, 1947; granted Oct. 29, 1948.*  
*Application for Supplemental Patent 369,482 filed in Belgium on Aug. 19, 1947.*

*Cl. XVII*

The invention concerns a process for underground gasification in which a flow of comburent gas is conducted to a fuel bed in ignition constituted of a bed in flames and in which the speed of movement of the fire zone is regulated; characterized by the fact that in order to accelerate the movement of the fire zone, at least one derivation of the current of comburent gas is put into operation at a point located on the normal arrival passages of the comburent gas in the vicinity of the fire zone but not yet reaching it.

Italy 442,322

**PROCESS FOR INCREASING THE CALORIFIC POWER FOR GASES PRODUCED AND TO REDUCE THE TEMPERATURE OF THE HEARTH IN UNDERGROUND GASIFICATION**

Pierre Demart, Brussels, Belgium

*Application filed Aug. 26, 1947; granted Nov. 22, 1948.*  
*Application 467,521 filed in Belgium Aug. 26, 1946.*

*Cl. XVII*

The present invention concerns a process for underground gasification in which a comburent gas containing carbon dioxide is used, characterized by the fact that carbon dioxide is extracted from the gases produced and is added to the comburent gas.

Italy 442,327

**PROCESS AND INSTALLATION FOR INTRODUCING A FLOW OF COMBURENT AIR TO AN UNDERGROUND FUEL BED IN COMBUSTION IN ORDER TO IMPROVE THE OPERATING CONDITIONS**

Pierre Demart, Brussels, Belgium

*Application filed Aug. 26, 1947; granted Nov. 22, 1948.*  
*Application 467,527 filed in Belgium on Aug. 26, 1946.*

*Cl. XVII*

The invention concerns a process and installation for underground gasification, in which a flow of comburent gas is introduced to a fuel bed in combustion; characterized by the fact that in the fire zone, at least for a certain time, a pressure above atmospheric pressure is maintained.

Italy 442,610

**METHOD FOR DIMINISHING THE TEMPERATURE IN UNDERGROUND GASIFICATION PROCESSES, BY MEANS OF INJECTION OF A FLUID INTO THE OUTLET PASSAGES OF THE GAS PRODUCED**

Pierre Demart, Brussels, Belgium

*Application filed Aug. 26, 1947; granted Nov. 27, 1948.*  
*Application 467,522 filed in Belgium on Aug. 26, 1946.*

*Cl. XVII*

The present invention concerns a process for underground gasification in which a flow of fuel gas is introduced to a hearth in ignition composed of a fuel bed in flames in which the gases produced are collected on their way toward evacuation; characterized by the fact that a fluid is injected in the said evacuation passages in order to diminish the temperature of the gases evacuated.

Italy 444,963

**GAS GENERATOR WITH DIRECT ASPIRATION REVERSED FOR THE PRODUCTION OF A GENERATOR GAS OBTAINED FROM DRIED OLIVE HUSKS OR WOOD WITHOUT THE AID OF SPECIAL DEVICES FOR THE ELIMINATION OF BITUMINOUS SUBSTANCES**

Osvaldo Novelli, Porticello, Italy

Raffaele Inzerillo, Palermo, Italy

*Application filed Feb. 5, 1948; granted Feb. 3, 1949.*

Cl. XVII

The invention concerns a gas generator with direct aspiration reversed for the production of generator gas extracted from the combustion of dried olive husks or wood without the aid of special devices for the extraction of bituminous substances produced by vegetable fuels; characterized by the fact that the air needed for combustion of the fuel, being introduced through orifices, causes the gas to pass through the incandescent mass where it deposits the bituminous residues.

Italy 445,214

**ELECTROTHERMIC GAS GENERATOR**

Paul Louis Joseph Miguet and Marcel Paul Perron, Saint Julien de Maurienne, France

*Application filed May 20, 1942; granted Feb. 10, 1949.*

Cl. XVII

The invention concerns an electrothermic gas generator, characterized by the fact that it is composed of a hollow body with a conductive bottom the walls of which, lined with a refractory packing, are perforated at intervals and in appropriate numbers, with extraction orifices connected by means of a system of pipes to a gas offtake collector, and by an electrode traversed by a system of axial ducts designed to permit possible injection of a fluid in proportion to the anticipated production.

Italy 446,318

**PROCESS AND APPARATUS FOR THE PRODUCTION OF SYNTHESIS GASES FROM VOLATILE GASEOUS HYDROCARBONS AND FROM OXYGEN**

Montecatini Società generale per l'Industria Mineraria e Chimica, Milan, Italy

*Application filed July 7, 1948; granted Mar. 16, 1949.*

Cl. XXIV

The invention concerns a process for the production of synthesis gases from gaseous volatile hydrocarbons and oxygen; characterized by the fact that the reaction is carried out without the addition of outside heat or injection of water vapor, partial combustion of the hydrocarbons being effected in a first phase, or of the gases containing them, with oxygen and/or air, and successively causing the gaseous mixture thus obtained to react in the presence of catalyzers, the said catalytic reaction occurring at the expense of the heat which was developed during the first phase of the process.

Italy 446,937

**IMPROVEMENT IN GAS GENERATORS**

West's Gas Improvement Co., Ltd., Manchester, United Kingdom

*Application filed Sept. 30, 1948; granted Mar. 29, 1949.**Application 28,839 filed in Great Britain Oct. 29, 1947 in the names of Frederick Joseph West, Ernest West, and the applicant.*

Cl. XVII

The present invention refers to a gas generator having its gas discharge pipe centrally suspended inside the gas generator below the admission orifice for feeding the fuel, with its bottom open at the level of the combustion stratum, the discharge pipe being inter-

nally lined with refractory material in such fashion that the gas generated is maintained at a high temperature while it passes from the gas producer and through the offtake pipe, and any tar vapors arising from the fire bed being effectively pyrofractionated and fixed in the offtake pipe while a reserve of fuel is supported above the top of the offtake pipe by the gas.

Italy 447,752

**SYSTEM FOR THE GASIFICATION OF FUELS UTILIZING MIXTURES OF AIR AND SMOKE**

Luigi Lazzeri, Sesto San Giovanni, Milan, Italy

*Application filed Oct. 29, 1948; granted Apr. 28, 1949.*

Cl. XVII

The invention concerns a system for the gasification of fuels, characterized by the fact that according to it the hearth of a gas generator is fed with air mixed with hot combustion products, taken from a chimney or the like.

Italy 448,293

**PROCESS AND DEVICE FOR THE GASIFICATION OF FINELY DIVIDED SOLID FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 21, 1948; granted May 12, 1949.**Application 30,365 filed in Switzerland Dec. 29, 1947.*

Cl. XVII

The invention concerns a process for the gasification in suspension of finely divided fuels with oxygen and preheated endothermically reactive gasification media; characterized by the fact that the heat needed for preheating the endothermically reactive gasification media is produced by burning a fuel with oxygen, in which case the combustion gases thus formed are introduced into the reaction chamber in which the gasification takes place together with the endothermically reactive gasification media.

Italy 448,668

**GAS GENERATOR DEVICE FOR THE PRODUCTION OF VALUABLE GASES FROM FINELY DIVIDED SOLID FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 21, 1948; granted May 23, 1949.**Application 30,366 filed in Switzerland Dec. 29, 1947.*

Cl. XVII

The invention concerns a gas generator device for the production of valuable gas through reaction in suspension of finely divided solid fuels with oxygen and possibly endothermically reactive gasification media, in which case the fuel is first mixed with oxygen, the mixture formed then being blown into the reaction chamber by means of several nozzles; characterized by the fact that to each nozzle through which the fuel-oxygen mixture passes into the reaction chamber, there is assigned a special mixer with a system for the mechanical adduction of the fuel.

Italy 448,680

**PROCESS FOR THE GASIFICATION IN SUSPENSION WITH OXYGEN OF FINELY DIVIDED SOLID FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 18, 1948; granted May 23, 1949.**Application 30,362 filed in Switzerland Dec. 29, 1947.*

Cl. XVII

The invention concerns a process for the gasification in suspension of finely divided solid fuels with oxygen and possibly with endothermically reactive gasification media; characterized by the fact that in the reaction chamber, independently from the gasification media, a combustible gas is introduced in such fashion that the mixture of hot industrial gas which is barely formed

and of fuel gas added which is drawn off from the reaction chamber, always presents a temperature higher than the ignition point of a mixture of gas and oxygen.

Italy 448,734

**PROCESS FOR THE PRODUCTION OF FUEL GASES FROM FINELY DIVIDED SOLID FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 18, 1948; granted May 25, 1949.*

*Application 30,363 filed in Switzerland Dec. 29, 1947.*

Cl. XVII

The invention concerns a process for the production of fuel gases through reaction in suspension of finely divided solid fuels with oxygen and with endothermically reactive gasification media; characterized by the fact that over 50% of the weight of the fuel is used with a granulation smaller than 0.05.

Italy 448,859

**IMPROVEMENT IN MECHANICAL GAS GENERATORS OPERATING WITH COKE OR ANOTHER SOLID FUEL**

West's Gas Improvement Co., Ltd., Miles Planting, Manchester, United Kingdom

*Application filed Nov. 30, 1948; granted May 27, 1949.*

Cl. XVII

The invention concerns a mechanical gas generator for use with solid fuel, having an ash-removal grate which is operated at a variable speed in order to regulate the speed of removal of the ashes for the purpose of maintaining a zone of maximum reaction or temperature, of a constant position and size; characterized by the fact that the speed of operation of the grate is automatically regulated by one or more thermostats in the gas generator which determine the direction of rotation of a motor which controls an increase or a decrease in the speed of the grate.

Italy 449,087

**DEVICE FOR THE GASIFICATION OF FINELY DIVIDED SOLID FUELS FOR THE PURPOSE OF PRODUCING VALUABLE GASES**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 22, 1948; granted June 4, 1949.*

*Application 30,364 filed on Dec. 29, 1947, in Switzerland*

Cl. XVII

The invention concerns a device for the gasification in suspension of finely divided solid fuels with oxygen and with endothermically reactive gasification media, in which case the fuel is blown by means of oxygen into a reaction chamber in which the exothermic reaction and the endothermic reaction takes place; characterized by the fact that the organs for introducing endothermically reactive reaction substances into the reaction chamber are arranged around the inlet point of the mixture of fuel and oxygen in such fashion that along the walls of the reaction chamber a continuous layer of the endothermically reactive substance, which layer includes the zone where the exothermic reaction takes place, is formed.

Italy 449,386

**PROCESS AND INSTALLATION FOR THE GASIFICATION OF CARBONACEOUS SUBSTANCES OF A FINE GRANULAR STRUCTURE**

Directi van de Staatsmijnen in Limburg, Handelend voor en Namens den Staat der Nederlanden, Heerlen, Netherlands

*Application filed Jan. 7, 1949; granted June 11, 1949.*

*Application 138,286 filed in the Netherlands Jan. 8, 1948.*

Cl. XVII

The invention concerns a process for the production of gaseous mixtures by means of the gasification of a

carbonaceous material of fine granular structure; characterized by the fact that the material to be gasified is preheated in a separate chamber connected with a gasification reactor up to approximately the temperature of gasification, and successively, after entrance into the gasification reactor. The material is gasified by means of a flow of combustion or reactant gas introduced into the gasification reactor at a temperature, which is higher than the gasification temperature, which flow of combustion gas is obtained by means of a complete or incomplete combustion of any type of fuel, preferably a gas, by means of oxygen or gas containing oxygen, to which flow of combustion gas, water vapor and/or carbon dioxide and/or other gasification agents, such as another flow of combustion gas can be added if necessary, and which flow of combustion or reactant gas has, inside the gasification reactor, a velocity which is regulated in such fashion as to be constantly lower than the velocity at which the largest particles of the gasification material introduced into the reactor would move if maintained in a state of suspension or turbulence.

Italy 450,243

**PROCESS FOR THE PRODUCTION OF FUEL GASES THROUGH THE GASIFICATION OF FINELY DIVIDED SOLID FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 18, 1948; granted July 12, 1949.*

*Application 30,361 filed in Switzerland Dec. 29, 1947.*

Cl. XVII

The invention concerns a process for the production of fuel gas from finely divided solid fuels in suspension through reaction with oxygen and endothermically reactive gasification media in a reaction chamber the walls of which are kept at such a temperature that the ashes from combustion can be deposited in a finely divided solid condition; characterized by the fact that first, outside the reaction chamber, a mixture is effected, possibly a homogeneous mixture, of fuel and oxygen at a temperature lower than the ignition temperature of the mixture itself, which is then introduced with simultaneous cooling into the reaction chamber at a speed such that the exothermic reaction between coal and oxygen is begun only inside the chamber, and in which there is present an excess of the endothermically reactive gasification medium.

Italy 450,244

**PROCESS FOR PRODUCING GAS CONTAINING CARBON MONOXIDE AND POSSIBLY HYDROGEN FROM FINELY DIVIDED SOLID FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 18, 1948; granted July 12, 1949.*

*Application 30,360 filed in Switzerland Dec. 29, 1947.*

The invention concerns a process for the production of gas containing carbon monoxide and possibly hydrogen through the reaction in suspension of finely divided fuels with oxygen as well as endothermically reactive gaseous media; characterized by the fact that in a reaction chamber insulated against heat loss, the finely divided fuel is blown in by means of a flow of oxygen, and that in the space included between the walls of the reaction chamber and the zone in which the exothermic reaction takes place, a continuous flow is created of endothermically reactive media in such fashion that the highly heated residue of the fuel, coming from the exothermic reaction zone, before touching the walls of the reaction chamber, comes in contact with endothermically reactive media, thus being cooled, so that the ashes of the fuel are deposited in a finely divided solid condition.

Italy 450,585

**PROCESS AND INSTALLATION FOR THE PRODUCTION OF OIL-CARBURETED WATER GAS**

Franz Schüssl, Milan, Italy

*Application filed Dec. 14, 1948; granted July 23, 1949.*  
*Cl. XVII*

The present invention concerns a process for the carburetion of water gas produced from bituminous fuels; characterized by the fact that carburetion by means of vapors of the tars and by means of carbureting oils is effected separately in two superheater-regenerators arranged in series.

Italy 451,588

**DEVICE FOR PREPARING A MIXTURE OF OXYGEN AND A COMBUSTIBLE SUBSTANCE, ESPECIALLY DESIGNED FOR INSTALLATIONS FOR THE PRODUCTION OF GASEOUS FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 27, 1948; granted Sept. 20, 1949.*  
*Application 30,367 filed in Switzerland on Dec. 29, 1947.*  
*Cl. XVII*

The present invention concerns a device for preparing a mixture of oxygen and of a combustible substance which is solid and finely divided, the said combustible substance being traversed by an Archimedes screw in the flow of oxygen; characterized by the fact that the said screw bears at its end the rotor of a crushing device shaped like a sort of macerating unit and composed of a fixed annular part and of a rotating body; and by the fact that on the periphery of the fixed annular body of the crushing device, an annular nozzle is provided for the flow of oxygen, which is drawn off and sweeps along the combustible substance produced to the periphery of the macerating device.

Italy 452,554

**PROCESS AND INSTALLATION FOR THE GASIFICATION OF FINE-GRANULAR CARBONACEOUS SUBSTANCES**

Directie Van de Staatsmijnen in Limburg, Handelend Voor en Namens den Staat der Nederlanden, Heerlen, Netherlands

*Application filed Dec. 28, 1948; granted Oct. 25, 1949.*  
*Application 137,740 filed in the Netherlands*  
*Dec. 29, 1947.*  
*Cl. XVII*

The present invention concerns a process for the production of gaseous mixtures by means of the gasification of carbonaceous materials of fine granular structure in two generators or reactors connected in series; characterized by the fact that the volume of the reaction space in one generator or reactor (the large reactor) represents a multiple of the volume of the reaction space in the other (smaller) reactor, and that the gasification takes place in the smaller reactor with the application of the principle of transverse flow at a high temperature and with a high capacity, but with a low production; and that in the large reactor, gasification takes place with an artificially increased concentration of the particles to be gasified, at a lower mean temperature, with a lower capacity and with a higher production than in the smaller reactor.

Italy 452,558

**IMPROVEMENTS MADE IN THE MEANS FOR PRODUCING GAS, ESPECIALLY GAS FOR THE SYNTHESIS OF AMMONIA**

Compagnie Pan-Européenne d'Installation &amp; d'Équipement Industriels S. à R. L., Paris, France

*Application filed Jan. 27, 1949; granted Oct. 25, 1949.*  
*Application of June 8, 1948 filed in France.*  
*Cl. XXIV*

The invention concerns a process for producing a

gas, especially a gas which serves for the synthesis of ammonia; characterized by the fact that in a hot producer gas in which the ratio between the sum of the amount of hydrogen ( $H_2$ ) and the carbon monoxide ( $CO$ ), on the one hand, and the amount of nitrogen ( $N_2$ ), on the other hand, which are in the said gas, is less than 3 to 1, coal dust which is ungasified or incompletely gasified is gasified, adding, during the said gasification of the coal dust a certain amount of oxygen and, preferably, of water vapor, in order to thus obtain, in the producer or generator gas and at the completion of the gasification of the coal dust in the said producer gas, a gas in which the ratio ( $H_2+CO$ ) :  $N_2$  is equal to about 3:1.

Italy 452,566

**PROCESS FOR IMPROVING THE REDUCTION OF WATER VAPOR IN ALL TYPES OF GAS GENERATORS**

Zsigmond Galocsy, Bergen Terbligit, Netherlands

*Application filed Jan. 13, 1949; granted Oct. 25, 1949.*  
*Cl. XVII*

The present invention concerns a process for improving the reduction of water vapor in all types of gas generators, whereby water vapor is distributed at points located above the points into which air and/or a gasifying mixture is introduced; characterized by the fact that water vapor at a temperature above  $900^\circ C.$  is conducted into the gas generator in a zone where the temperature is at least  $900^\circ C.$ , the superheating of the water vapor being effected in such fashion that a cold or hot fuel, for example a gas, is burned together with hot or cold oxygen of any given grade of purity, the said expression also including air, in a combustion chamber functionally connected with the gas generator, with a simultaneous distribution of cold or hot water vapor; and by the fact that in their nascent state, the hot combustion gases, consisting mainly of water vapor, carbon dioxide, nitrogen, and a possible excess of oxygen, together with their total heat content, are blown into the gasification chamber at a high velocity, where the water vapor is immediately reduced according to the reaction  $C + H_2O \rightarrow CO + H_2$ , with the complete use of the excess heat of the gas.

Italy 452,702

**PROCESS AND APPARATUS FOR THE GASIFICATION OF ALL TYPES OF FUELS SUITABLE FOR THE PRODUCTION OF GAS WITH A HIGH PERCENTAGE OF CARBON MONOXIDE AND HYDROGEN PARTICULARLY ADAPTED FOR THE SYNTHESIS OF AMMONIA, METHANOL, HYDROCARBONS AND THE LIKE**

Società Italiana Carburanti Sintetici (S.I.C.S.) Società per Azioni, Florence, Italy

*Application filed Jan. 5, 1949; granted Oct. 29, 1949.*  
*Cl. XXIV*

The present invention concerns a process and installation for gasification of solid fuels, characterized by the fact that a pulverized fuel is introduced into conical chambers emptying into the generator, the said pulverized fuel being swept along by oxygen jets towards tuyères with convergent axes, and with annular nozzles being provided which surrounds the oxygen nozzles for the adduction of steam.

Italy 457,353

**GASIFICATION INSTALLATION**

Henry Balfour &amp; Co., Ltd., William Lindsay Burns, and James Waite Gibson, Leven, United Kingdom

*Application filed Aug. 2, 1946; granted May 15, 1950.*  
*Cl. XVII*

The present invention concerns a gasification installation including a substantially cylindrical generator

with a grate and an annular column, substantially co-axial with the generator and which rises from the grate, the said column including pipes which are co-axial one with the other.

Italy 457,924

**PROCESS FOR THE GASIFICATION OF FINE-GRANULAR CARBONACEOUS SUBSTANCES**

de Directie van de Staatsmijnen in Limburg Handelend Voor en Namens den Staat der Nederlanden, Heerlen, Netherlands

*Application filed Aug. 13, 1949; granted June 17, 1950.*

*Application 140,345 filed May 8, 1948 in the Netherlands.*

*Cl. XVII*

The invention concerns a process for the preparation of a mixture of gas, gasifying coal, carbonaceous and/or carbonizable materials in fine-granular form according to Patent 452,554 wherein a cyclone is adapted as a small gas generator; characterized by the fact that the materials to be gasified, heated or not heated, are introduced into the cyclone with the aid of a feed cyclone, in which these materials are heated approximately at the temperature of the gasification, simultaneously introducing any type of fuel, preferably a gaseous fuel, into the feed cyclone and burning it with the aid of oxygen or of gas containing oxygen.

Italy 459,044

**PROCESS FOR THE TREATMENT OF CRUSHABLE SOLID SUBSTANCES, IN PARTICULAR FOR HEATING AND DRYING THEM AND FOR THE GASIFICATION OF FOSSIL FUEL**

Texaco Development Corporation, New York, N.Y., U.S.A.

*Application filed Sept. 27, 1949; granted Aug. 23, 1950.*

*Cl. XVII*

The invention concerns a process for treating a crushable solid material, characterized by the mixing of the said solid in granular form with an evaporatable liquid, in a quantity sufficient to form a liquid mixture; by causing the said mixture to pass, as a confined flow, in turbulent flow through a heating zone, in which the said mixture is heated at a temperature at least sufficient to substantially evaporate all the said liquid, thus forming a dispersion of solid particles in a flow of the resulting vapors, and by subjecting the said particles to the disintegrating action of the evaporation of the liquid from the surface of the said particles and to the turbulent flow of the confined steam.

Italy 461,976

**PROCESS FOR THE PRODUCTION OF FUEL GASES CONTAINING METHANE FROM FINELY DIVIDED SOLID FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 6, 1949; granted Feb. 21, 1951.*

*Application 40078 filed in Switzerland Dec. 7, 1948.*

*Cl. XVII*

The invention concerns a process for the production of fuel gases containing methane by means of gasification, effected in suspension, of finely divided solid fuels with oxygen and gaseous media reacting endothermically at a high temperature with carbon, in which case the gas produced is brought into contact with a catalyzer which accelerates the formation of methane; characterized by the fact that the finely divided fuel is mixed with oxygen under high pressure, but at a temperature lower than the ignition temperature, and by the fact that the mixture is blown continuously into a reaction chamber which is pressure-resistant and maintained at a high pressure, being ignited here and caused to react without a sensible pressure varia-

tion, in which case a medium which is endothermically reactive with carbon is made to circulate, under high pressure, in the space included between the exothermic reaction zone and the reaction wall, while the gas thus produced, containing carbon monoxide and hydrogen, is successively brought, always under pressure, into contact with semicoke.

Italy 461,977

**PROCESS AND APPARATUS FOR THE PRODUCTION OF FINELY DIVIDED COKE FROM BITUMINOUS FUELS**

Koppers Co., Inc., Pittsburgh, Pa., U.S.A.

*Application filed Dec. 6, 1949; granted Feb. 21, 1951.*

*Application 40,079 filed in Switzerland Dec. 7, 1948.*

*Cl. XVII*

The invention concerns a process for the production of finely divided coke from bituminous fuels which—as in the case of pitch, asphalt, petroleum residues, bituminous coal, etc.—are solid at a low temperature and become soft or liquid at a higher temperature; characterized by the fact that the solid fuel is mixed in a finely divided state with a cold gaseous medium, and the mixture is blown into an atmosphere held at a high temperature in such fashion that the fuel releases its volatile components at least to such an extent that the coke-type residue which is deposited no longer agglomerates.

Italy 468,471

**CYCLONE FURNACE FOR THE COMBUSTION OF FUELS OF SMALL GRANULOMETRIC DIMENSIONS**

Directie van de Staats Mijnen in Limburg, Handelend voor en Namens den Staat der Nederlanden, Heerlen, Netherlands

*Application filed Sept. 12, 1950; granted Jan. 22, 1952.*

*Application 148,716 filed in the Netherlands Sept. 15, 1949.*

*Cl. XVII*

The invention concerns a cyclone furnace for the combustion of fuels of small granulometric dimensions, with a radially symmetrical combustion space, having a tangential inlet orifice for the fuels and for the combustion agent and an axial discharge orifice for the combustion gases; characterized by the fact that the combustion space, both on the side of the discharge orifice and on the other side, is transformed into an annular, axially symmetrical space, and then both the side of the annular space and the side of the discharge space are provided with an orifice with a common inlet for the fuels with the combustion agent, whereas the discharge orifice for the liquid slag is constituted in the annular space on the opposite side.

Italy 468,502

**PROCESS FOR PRODUCING WATER GAS FROM BITUMINOUS FUELS WHICH ARE NONCAKING OR WEAKLY CAKING**

I.G. Farbenindustrie A.G., Frankfurt am Main, Germany

*Application filed May 4, 1943; granted Jan. 25, 1952.*

*Application I. 72189 filed in Germany May 7, 1942.*

*Cl. XVII*

The invention concerns a process for the production of water gas which is virtually completely free of hydrocarbons, from noncaking or weakly caking bituminous fuels, in gas generators with an upper low-temperature distillation chamber in alternating operation with hot blowing and gasification without the use of circulation gas, with simultaneous production of tars; characterized by the fact that the low-temperature distillation is carried out in the upper low-temperature distillation chamber of the gas generator exclusively with blowing gases which, in the

lower part of the vertical chamber, heat the fuel by blowing and in the upper part distill it at a low temperature, while in the gasification (cold blowing), the vapor, heated at least to the temperature of the low-temperature distillation of the fuel—for example, to 700°—is made to pass only from top to bottom through the lower part of the vertical chamber, which is filled with fuel already distilled at a low temperature.

Italy 469,016

PROCESS AND APPARATUS FOR THE EXTRACTION OF GAS, OILS, AND COALS FROM BITUMINOUS AND PYROBITUMINOUS ROCKS SUCH AS SCHIST AND PEAT

Jair Alves Horta, São Paolo, Brazil

*Application filed May 24, 1950; granted Feb. 13, 1952.*

*Application 50,535 filed in Brazil June 30, 1949.*

Cl. XVII

The invention concerns a process and apparatus for the extraction of gas, oils and coals from bituminous and pyrobituminous rocks such as schists and peat, including a retort of refractory material equipped with charging and discharging orifices, connected to a condenser cooled by water and to a storage holder for the oily products and condensable gases; characterized by the union of the internal heating devices by means of electric resistances, arranged throughout the body of the retort in such fashion as to produce a uniform and regulatable temperature; and by the hermetic closure of the same retort, which prevents any entry of air or other alien substance; and by the action of a low pressure produced by a vacuum pump interposed between the retort and the condensation chamber.

Italy 469,155

PROCESS FOR THE GASIFICATION OF FINE-GRANULAR FUELS

Demag A.G., Duisburg, Germany

*Application filed Mar. 8, 1950; granted Feb. 19, 1952.*

Cl. XVII

The present invention concerns the gasification of fine-granular fuels with the process for the descent of the gasification medium, and the use of inert gases to cause the fuel bed to become sedimented in brief intervening periods in which the coarser components of the fuel bed, especially the slag which is formed in the upper part of the fuel bed during blowing downward, fall to the bottom and are eliminated in the conventional way for gas generators.

Italy 470,662

PROCESS FOR THE DISTILLATION OF FUELS

Francesco Roma, Rome, Italy

*Application filed Aug. 18, 1950; granted Apr. 18, 1952.*

Cl. XVII

The invention concerns a continuous mechanized process of distillation of fuels, one of the methods of the carrying out of which is represented on the attached chart; characterized by the fact that the heating of the materials to be treated in descending motion is obtained in the upper part of a vertical retort, with direct contact and the releasing of the sensible heat of part of a mixture of hot distillation gas and super-

heated water vapor circulating from the bottom toward the top in a closed cycle, in countercurrent with the material to be treated.

Italy 470,714

PROCESS FOR THE PRODUCTION OF MIXTURES OF CARBON MONOXIDE AND HYDROGEN IN RUNOFF GAS GENERATORS

Badische Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany

*Application filed Aug. 2, 1950; granted Apr. 22, 1952.*

Cl. XVII

The invention concerns a process for the production of mixtures of carbon monoxide and hydrogen in runoff gas generators operating with coke; characterized by the fact that a material containing carbon in fine particles is introduced together with gasification media containing free oxygen by means of burners in the fuel bed of the gas generator, and an oxygen content for the gas introduced is selected which is such that a temperature of at least 1300° is obtained in the fuel bed.

Italy 470,807

PROCESS FOR THE GASIFICATION OF FINE-GRANULAR OR SIMILAR FUELS IN TWO OR MORE GENERATORS

Demag A.G., Duisburg, Germany

*Application filed Mar. 9, 1950; granted Apr. 26, 1952.*

*Application 56244 filed in Germany Sept. 28, 1949.*

The invention concerns a process for the production of gas in two or more generators in alternating operation, characterized by the fact that the fuel beds of the generators are placed alternately in a state of fluctuation and in whirling motion through a gaseous media, for their preparation.

Italy 471,328

FURNACE FOR THE DEGASIFICATION AND GASIFICATION OF FUELS HIGH IN ASH

C. Otto & Co. G.m.b.H., Bochum, Germany

*Application filed Sept. 26, 1950; granted May 13, 1952.*

Cl. XVII

The invention concerns a furnace for the degasification and gasification of fuels high in ash, with vertical, continuously operating chambers with a rectangular cross section, in which the scrubbing medium flows from one side to the other of the breadth, through the fuel; characterized by the fact that the height of the fuel colliding with the scrubbing medium has a ratio to the thickness of the fuel bed which is higher than 10 to 1.

Italy 472,458

PROCESS FOR THE COMBUSTION OF DEGASIFIED FOSSIL COAL IN PULVERIZED FORM OR OF FINE GRAINS

Hamburger Gaswerke G.m.b.H., Hamburg, Germany

*Application filed Sept. 7, 1950; granted June 20, 1952.*

*Application 2485 filed in Germany Apr. 22, 1950.*

Cl. XVII

The invention concerns a process for the combustion of degasified fossil coals in pulverized form or fine grains, characterized by the fact that coke is burned from fossil coal which has been degasified to the maximum possible degree (having approximately 2 to 5% volatile components), without the addition of gas during operation, preheating the comburent air from 0° to approximately 350°.



Italy 473,752

## PROCESS FOR THE MANUFACTURE OF TOWN GAS STARTING FROM METHANE OR OTHER GASEOUS HYDROCARBONS

Badische Anilin- &amp; Soda-Fabrik, Ludwigshafen am Rhein, Germany

*Application filed Jan. 30, 1951; granted Aug. 11, 1952. Application B. 11844 filed in Germany Oct. 4, 1950. Cl. XVII*

The invention concerns a process for the manufacture of town gas starting from methane and other gaseous hydrocarbons through partial reaction with water vapor in the presence of catalyzers containing nickel, with external heating; characterized by the fact that the reaction is effected in chambers or retorts of ceramic refractory material filled with catalyzers, and the distance between the walls of which does not exceed 15 centimeters.

Italy 473,861

## PROCESS FOR THE PRODUCTION OF FUEL GAS, CARBON MONOXIDE AND HYDROGEN MIXED WITH GASEOUS HYDROCARBONS

United Engineers &amp; Constructors, Inc., Philadelphia, Pa., U.S.A.

*Application filed Mar. 28, 1950; granted Aug. 18, 1952. Cl. XVII*

The invention concerns a process for the manufacture of carbureted fuel gas, consisting of producing fuel gas by blowing above a fuel bed in ignition, a gaseous mixture of a gas containing oxygen and which maintains combustion (preferably oxygen) and of a fluid suitable for producing gas through endothermic reaction of hot carbon (preferably water vapor); and of causing this fuel gas to pass through a zone heated by pyrolysis of hydrocarbons; and of carbureting this fuel gas, during its passage through the said zone, with an enriching gas with a calorific value superior to that of the said fuel gas, the said enriching gas being produced through the reaction of a fluid hydro-carbureted material, in the said pyrolysis zone, during the passage of the said fuel gas through the same, with a gaseous mixture of additional gas containing additional concentrated oxygen, and of additional fluid suitable for producing gas through endothermic reaction with hot carbon (preferably additional water vapor).

Italy 475,422

## PROCESS AND APPARATUS FOR CONVERTING NORMALLY LIQUID HYDROCARBONS AND GASEOUS CONDENSIBLE HYDROCARBONS INTO FUEL GASES ESPECIALLY SUITABLE FOR HEATING

Allied Chemical &amp; Dye Corporation, New York, N.Y., U.S.A.

*Application filed Aug. 29, 1950; granted Oct. 29, 1952. Application 113,766 filed in the U.S.A. on Sept. 2, 1949. Cl. XVII*

The invention concerns a process for the production of fuel gas from liquid hydrocarbons, characterized by causing water vapor to pass through a zone containing hot refractory material to preheat the water vapor; causing the superheated water vapor to pass above through a substantially unimpeded reaction zone maintained at a temperature sufficiently high to evaporate and partially crack liquid hydrocarbons; spraying liquid hydrocarbons below in the reaction zone in countercurrent to the flow of the water vapor through the said zone, whereby the oil is evaporated substantially completely and partially cracked in the zone; and causing the resulting gaseous reaction mixture from the reaction zone to pass below through a fixing zone containing a refractory heat-storing material at a temperature sufficiently high to fix the mixture from gaseous reaction.

Italy 475,746

## PROCESS FOR THE PRODUCTION OF FUEL GASES

Heinrich Koppers G.m.b.H., Essen, Germany

*Application filed May 16, 1951; granted Nov. 13, 1952. Application 3318 filed in Germany May 23, 1950. Cl. XVII*

The invention concerns a process for the production of valuable gases by means of gasification of finely divided fuels maintained in suspension with gaseous liquids or in the form of vapor reacting exothermically and endothermically in a reaction chamber which is at a high temperature, into which the fuel is blown; characterized by the fact that the fuel is blown in as a mixture with oxygen and a gaseous fluid or in the form of vapors reacting endothermically. The composition, the temperature, and the diffusion of the components of the mixture are regulated in such fashion that the heat necessary for the endothermic reaction within the reaction chamber is substantially generated through the exothermic reaction between the fuel and oxygen.

Italy 476,276

## PROCESS FOR THE PRODUCTION OF OIL GAS

The Gas Machinery Co., Cleveland, Ohio, U.S.A.

*Patent application filed Feb. 26, 1951; granted Dec. 4, 1952. Application 151,222 filed in the U.S.A. on Mar. 22, 1950. Cl. XVII*

The present invention concerns a process for the production of oil gas from a hydrocarbureted oil in an installation for the production of oil gas which has at least one gas-generating zone and one superheating zone communicating with the latter, which zones are periodically heated by the passage of the hot products of the combustion of air and preheated oil through them, the said hydrocarbureted oil being made to pass alternately and periodically during a preformation cycle through at least one of the heated gas-generation zones and the said superheating zone; the improvement including the introduction of blowing air into the installation at least at one point removed from at least one generation zone and causing the said blowing air and the said blowing gases to pass backwards through the generation zone, and discharging the said air and the said gas of the installation, the said blowing air being successively introduced to a cycle of formation.

Italy 476,716

## PROCESS AND APPARATUS FOR CONVERTING NORMALLY LIQUID HYDROCARBONS AND GASEOUS CONDENSABLE HYDROCARBONS INTO FUEL GASES ESPECIALLY SUITABLE FOR HEATING

Allied Chemical &amp; Dye Corporation, New York, N.Y., U.S.A.

*Application filed Aug. 28, 1950; granted Dec. 22, 1952. Application 113,765 filed in the U.S.A. Sept. 2, 1949. Cl. XVII*

The invention concerns a process for the production of fuel gas from hydrocarbureted oil, characterized by causing water vapor to pass through a zone containing hot refractory material in order to preheat the water vapor; by causing the preheated water vapor to pass above through a substantially unimpeded reaction zone maintained at a temperature sufficiently high to evaporate and partially heat-crack liquid hydrocarbons; by spraying liquid hydrocarbons below into the reaction zone in countercurrent to the flux of the water vapor, whereby the oil is substantially internally evaporated and partially heat-cracked in the reaction zone; by causing the resulting mixture of gaseous reaction to pass from the reaction zone below through a second substantially unimpeded reaction

zone maintained at a temperature which is sufficiently high to effect the further pyrocracking of the gaseous reaction mixture; and by causing the gaseous reaction mixture to pass from the second reaction zone below through a fixing zone containing a refractory heat-storage material at a temperature sufficiently high to fix the gaseous reaction mixture.

Italy 477,462

PROCESS FOR THE PRODUCTION OF A SYNTHESIS GAS WITH A LOW METHANE CONTENT

Didier-Kogag-Hinselmann, Koksofenbau und Gasverwertung A. G., Essen, Germany

*Application filed Dec. 11, 1950; granted Jan. 23, 1953.*  
*Application 5694 filed in Austria Dec. 12, 1949.*

Cl. XVII.

The invention concerns a process for the production of a synthesis gas with a low methane content by means of the thermic cracking of gases containing hydrocarbons, such as coke-oven gas, exhaust gas from the hydrogenation of coal, and the like, with water vapor at high temperatures, according to the recuperative system; characterized by the fact that there is introduced into the hot cracking gas containing only a small remaining amount of methane, a quantity of oxygen or gas containing oxygen corresponding to the content of methane.

Italy 478,109

PROCESS AND APPARATUS FOR THE MANUFACTURE OF GASEOUS HYDROCARBONS STARTING FROM LIQUID HYDROCARBONS SUCH AS PETROLEUM

The Gas Machinery Co., Cleveland, Ohio, U.S.A.

*Application filed June 28, 1950; granted Feb. 11, 1953.*  
*Application 119,364 filed in the U.S.A. Oct. 3, 1949.*

Cl. XVII

The invention concerns a process for manufacturing gaseous hydrocarbons by the pyrolytic treatment of mineral oils in a system for gaseous hydrocarbons having two casings, each of which contains a pyrolysis zone for cracking the oil, and a connecting zone which connects the two casings at their top; characterized by the heating of one of the casings by causing air to be passed above through the other casing in order to burn the carbonaceous materials therein, the combustion products of the air and of the carbonaceous products passing through the connecting zone and below through the aforementioned casing in order first to supply heat to the connecting zone and to the first-mentioned casing, and to successively introduce production oil at the top of at least one of the casings for the conversion into gaseous hydrocarbons.

Italy 478,787

PROCESS FOR PLACING GAS IN CONTACT WITH FINELY DIVIDED SOLIDS, PARTICULARLY FOR THE CATALYTIC PYROFISSION OF LIQUID HYDROCARBONS

Standard Oil Development Co., Elizabeth, N.J., U.S.A.

*Patent application filed Aug. 27, 1951; granted Mar. 4, 1953.* *Application 182,719 filed in the U.S.A. Sept. 1, 1950.*

Cl. XVII

The invention concerns a process for placing gas and pulverized solids in contact with one another, in which the pulverized fuel is made to circulate continuously in a closed system, and where a relatively dense suspension of solids and gas is maintained at all points of the system; characterized by a reduction in the dimensions of the solid particles while they are circulating in the system, by injecting a jet of gas in the dense suspension at a velocity of the jet sufficient to triturate the larger particles of the solids into more

minute particles, and by an adjustment of the speed of the jet of gas in order to regulate the speed of trituration.

Italy 479,241

PROCESS FOR THE DISSOCIATION OF GASEOUS AND LIQUID HYDROCARBONS WITH THE USE OF OXYGEN, FOR SUBSTITUTING THE HEAT CONSUMED DURING THE DISSOCIATION PERIOD, FOR OBTAINING FUEL GASES, IN PARTICULAR SYNTHESIS GASES, TOWN GAS, AND THE LIKE

Badische Anilin- & Soda-Fabrik, Ludwigshafen am Rhein, Germany

*Application filed Feb. 23, 1951; granted Mar. 21, 1953.*  
*Application B 2382 filed in Germany Mar. 3, 1950.*

Cl. XVII

The invention concerns a process for the dissociation of gaseous and liquid hydrocarbons, or substances containing hydrocarbons for the purpose of generating fuel gases, in particular oil gas, synthesis gases, town gas, etc., by the introduction of the raw substances into a layer of solid granular substances, in particular those with a catalytic action, heated to a high temperature, which substances are kept in undulating motion throughout the entire height of the layer by means of gas or vapors, possibly the same hydrocarbon to be dissociated, introduced from below or from one side, the heat required for the reaction being obtained continuously through exothermic reaction of oxygen passed continuously in a mixture with the solid substances in motion, or with the substances to be dissociated, or with their residues; characterized by the fact that the oxygen or the gases containing oxygen are introduced from one side completely or to a predominant extent above the grate in the bed of solid substances in motion, and from the other side, the gases or vapors are introduced through the grate, in particular water vapor, which gases or vapors react endothermically with the solid substances in motion and with the substances to be dissociated.

Italy 481,674

DEVICE FOR THE HEATING OF FURNACES FOR THE PRODUCTION OF GAS AND COKE CARBON WITH VARIOUS VERTICAL, EXTERNALLY HEATED GASIFICATION CHAMBERS

Didier-Werke A.G., Wiesbaden, Germany

*Application filed Nov. 12, 1951; granted June 6, 1953.*  
*Application D. 2778 filed in Germany May 12, 1950.*

Cl. XVII

The invention concerns a device for heating gas and coke carbon furnaces with various vertical, externally heated gasification chambers, and distribution of the quantity of fuel in the body of the furnace through the individual heating walls; characterized by the fact that each of the heating walls is connected to the feed conduit existing in the body of the furnace and to the fuel-distribution conduit through the furnace, by means of a connecting pipe extending as far as an outer wall of the furnace and in that location easily accessible from the outside, separately by similar pipes which serve for the other heating walls.

Italy 482,698

IMPROVEMENT IN OVENS FOR THE PRODUCTION OF GAS AND COKE

Heinrich Koppers G.m.b.H., Essen, Germany

*Application filed Dec. 21, 1951; granted July 7, 1953.*  
*Application K. 8523 filed in Germany on Dec. 27, 1950.*

Cl. XVII

The invention concerns a furnace of the shaft type, particularly a furnace with a horizontal shaft, for the production of gas and coke, provided with a system of

heating by heavy gas and with the adduction of air in a limited quantity to the pipes for bringing in the heavy gas for the purpose of eliminating the explosive mixtures contained in the gas and of removing the deposits of graphite; characterized by the fact that the opening for the inlet of air into the pipe for bringing in the heavy gas is arranged in a zone of the said pipe in which the temperature is above the ignition temperature of the mixture of gas and of air.

Italy 482,821

DEVICE FOR THE JOINT MANUEVERING OF A NUMBER OF LOWER COVERS OF THE VERTICAL SHAFTS OF FURNACES, FOR EXAMPLE, OVENS FOR THE PRODUCTION OF GAS AND COKE

Didier-Werke A.G., Wiesbaden, Germany

*Application filed May 10, 1951; granted July 13, 1953.*  
*Application D. 2778 filed in Germany May 12, 1950.*  
Cl. XVII

The invention concerns a device for jointly maneuvering a number of lower closure covers for vertical shafts with a control force which functions from one end of the furnace for the opening and closing of covers which are mounted in a rotating fashion around an axle tree; characterized by a rail built in the manner of an endless conveyor belt, at the two extremities of which are respectively arranged screw spindles, arranged in the direction of the two parts of the conveyor belt, one of which screw spindles has a left thread and the other a right thread, both having an equal rotation around their longitudinal axis, and each spindle being equipped with a female nut which moves on the thread of the respective spindle, the said nut being connected with a part of the conveyor belt.

Italy 483,713

INSTALLATION FOR THE GASIFICATION OF FINELY DIVIDED FUELS

Heinrich Koppers G.m.b.H., Essen, Germany

*Application filed July 26, 1951; granted Aug. 11, 1953.*  
*Application K. 5939 filed in Germany Aug. 17, 1950.*  
Cl. XVII

The invention concerns an installation for the production of fuel-gases of value by means of the gasification of fuel fines, and especially of the fines of solid fuels, with oxygen and possibly with water vapor, the fuels being kept in suspension during reaction in the gaseous reaction medium, and made to move in a substantially equal direction as the direction of the gaseous reaction medium, while along the walls of the reaction chamber a vapor of a fluid gaseous medium is maintained which surrounds the primary zone; characterized by the fact that the reaction chamber, at the entry point of the reaction media, is delimited by a cooled metal unit which forms on one side the entrance for the fuel-oxygen mixture, and from the other side the entrance for the gaseous medium which serves to form the vapor, while the parts of the reaction chamber are composed, for the rest, of a refractory ceramic material.

Italy 485,813

PROCESS FOR THE PRODUCTION OF A MIXTURE OF GAS FROM THE REDUCTION OF METHANE, OR GAS CONTAINING METHANE, AND INSTALLATION FOR CARRYING OUT THE PROCESS

Ateliers des Charmilles S.A., Geneva, Switzerland

*Application filed Aug. 14, 1951; granted Oct. 19, 1953.*  
Cl. XVII

The invention concerns a process for the production of a mixture of gas from the reduction of methane or a gas containing methane, characterized by the fact that methane gas is mixed with water vapor and is

conveyed to a furnace heated by electric induction, where the mixture is heated and kept at the decomposition temperature of methane, in such fashion that the methane is decomposed into carbon monoxide and H<sub>2</sub>.

Italy 486,502

PROCESS CONCERNING THE CRACKING OF METHANE GAS OR SIMILAR HYDROCARBONS FOR THE PRODUCTION OF ILLUMINATING GAS OR TECHNICAL GASES

Zsigmond De Galocsy, Brussels, Belgium

*Application filed Feb. 9, 1951; granted Nov. 11, 1953.*  
Cl. XVII

The invention concerns a process for the conversion of methane or similar hydrocarbons, or gases containing the same, through the use of water vapor alone with carbonic acid, or of carbonic acid alone, in order to produce synthesis gas, hydrocarbureted gas, or gas of a public service; characterized by the fact that the conversion is effected in two separate phases. In the first phase, a liquid or gaseous fuel is burned, possibly preheated, with oxygen of an appropriate concentration, at natural temperature to it even preheated; and the hot combustion gases composed of H<sub>2</sub>O, CO<sub>2</sub>, and possibly of a residual excess of O<sub>2</sub> and H<sub>2</sub>, effect, during the second phase, the conversion of the hydrocarbon into carbon monoxide and hydrogen.

Italy 487,351

METHOD AND APPARATUS FOR THE PRODUCTION OF FUEL GAS

United Engineers & Constructors, Inc., Philadelphia, Pa., U.S.A.

*Application filed Mar. 27, 1952; granted Nov. 30, 1953.*  
*Application 218,125 filed in the U.S.A. on Mar. 29, 1951.*  
Cl. XVII

The invention concerns a cyclical method for the production of oil gas including alternating phases of heating of a refractory material for heat storage and of pyrolysis of the oil in the said refractory material for the storage of heat in order to form a fuel gas, including in one part of the cycle the injection of a mixture composed of fluid fuel and air sent from top to bottom, from a point close to the top of a limited combustion zone, relatively empty, equipped with an outlet opening close to the top of the zone, through which the resulting flame descends toward the bottom of the said zone, accumulating heat; the departure of the resulting hot products of combustion through the said orifice near the top of the said zone; the passage of the said hot combustion products through a refractory material for the storage of heat, yielding heat to the said material; and, in another part of the cycle, the introduction of oil in the said zone, the vaporization of the oil in the said zone; the departure of the resulting vaporized oil through the said orifice close to the top of the said zone; the passage of the said vaporized oil through the said hot refractory material for the storage of heat; the pyrolysis therein of the said oil into a fuel gas; and the conveying of the said gas to the storage holder.

Italy 488,602

PROCESS FOR THE PRODUCTION OF DIFFERENT TYPES OF COKE AND COKING AND ILLUMINATING GAS

Walther Feld & Co., Essen, Germany

*Application filed Mar. 14, 1950; granted Dec. 29, 1953.*  
*Application P. 42651 filed in Germany May 13, 1949.*  
Cl. XVII

The invention concerns a process for the production of different types of coke and coke from low-temperature distillation or coking gas or illuminating gas and byproducts, as well as coals poorly adapted or unsuitable for the normal operation of coking ovens; char-

acterized by the fact that a part of the coal which varies according to local conditions, in adaptation to its characteristics, is distilled at a low temperature and is added to the other part of the coal destined for coking and for tempering as a thinning medium.

Italy 489,025

**GAS GENERATORS WITH CHARACTERISTICS PARTICULARLY SUITABLE FOR DOMESTIC AND INDUSTRIAL HEATING**

Virgil Stark, Forest Hills, N.Y., U.S.A.

*Application filed Sept. 20, 1951; granted Jan. 13, 1954.*  
*Application 192,865 filed in the U.S.A. Oct. 30, 1950.*

Cl. XVII

The invention concerns a process for the production of heating gas with highly reductive properties starting with hydrocarbons with a high calorific value and from water; characterized by the fact that a fluid mixture of hydrocarbons and water is formed, and that the said mixture is subjected to heat in a series of stages, the last of which is at least at a temperature of 1,800° and in which the volume and the temperature of the said mixture are brought up to the point of pyrolysis of the hydrocarbons and of dissociation of the water, in order to produce a permanent gas.

Italy 489,670

**IMPROVEMENTS IN APPARATUS FOR PRODUCING WATER GAS BY CARBURETION WITH HEAVY OILS**

Société de Construction d'Appareils pour Gaz à l'Écu & Gaz Industriels, Montrouge, France

*Application filed May 17, 1952; granted Jan. 25, 1954.*  
*Application filed in France May 21, 1951.*

Cl. XVII

The invention concerns improvements in apparatus for producing water gas by carburetion with heavy oils, including a tangential admission of the gas in the upper part of the carburetor, an injection into the carburetor of finely atomized oil in the form of a hollow cone, an annular internal projection in the lower part of the carburetor, and air-inlet openings above the projection or higher up in order to assure combustion of any carbon which may be deposited, the said improvements being substantially as aforesaid and represented.

Italy 490,150

**DEVICE FOR THE GASIFICATION OF FINELY SUBDIVIDED FUELS**

Heinrich Koppers G.m.b.H., Essen, Germany

*Application filed May 16, 1952; granted Feb. 6, 1954.*  
*Application for supplementary patent K-10138 filed in Germany May 31, 1951.*

Cl. XVII

The invention concerns a device for producing gas of a high fuel value by means of the gasification of finely divided fuels, especially solid fuels, with oxygen and, in certain cases, with water vapor, according to principal Patent 483,713, in which the reaction chamber on the side, where the reaction medium is admitted, is limited by a cooled column or metal wall which forms the entrance for the mixture of fuel and oxygen and the entrance for the gaseous medium which serves for the formation of the so-called film [or vapor], whereas the walls of the reaction chamber consist, moreover, of a refractory ceramic material; characterized by the fact that the annular nozzle which surrounds the nozzle for the mixture of fuel and oxygen, for the gaseous mixture which forms the film (water vapor, carbon dioxide, etc.) is limited on the external side by a special cooling duct in the form of a ring on the outer side [which] is limited by the cooled external wall of the nozzle for the fuel and oxygen.

Italy 490,690

**PROCESS AND APPARATUS FOR THE PRODUCTION OF A FUEL GAS WHICH CAN BE USED AS A SUBSTITUTE FOR NATURAL GAS**

Allied Chemical & Dye Corporation, New York, N.Y., U.S.A.

*Application filed July 14, 1952; granted Feb. 13, 1954.*  
*Application 238,532 filed in the U.S.A. July 25, 1951.*

Cl. XVII

The present invention concerns a process for the production of a fuel gas with a high Btu and low specific weight in a gas generator system including a chamber lined with refractory material containing an open space for the flow of gas through the said chamber; a second chamber lined with refractory material which communicates with the first chamber and contains likewise an open space for the flow of gas through the said second chamber; and a fixing chamber containing refractory material, communicating with the second chamber; characterized by the fact that the chambers are heated and a gas with a high Btu and low specific weight is generated by simultaneously introducing hydrocarbonated oil into the open space of the first and second chambers and completely evaporating the oil thus introduced by radiant heat while the said oil is in the open spaces of the first and second chambers; and by causing the resulting oil vapors to pass over a hot refractory material in order to produce the fuel gas.

Italy 491,863

**PROCESS FOR THE PRODUCTION OF FUEL GASES**

Heinrich Koppers G.m.b.H., Essen, Germany

*Application filed June 19, 1952; granted Mar. 11, 1954.*  
*Application K10,591 filed in Germany July 13, 1951.*

Cl. XVII

The invention concerns a process for producing fuel gas by means of the decomposition of pulverized solid fuels, particularly in suspension with oxygen and endothermically reactive gasification media such as water vapor or carbonic acid, in which a predetermined mixture of fuel and gasification media is blown as a carrying gas into a reaction chamber maintained at a high temperature; characterized by the fact that the reaction elements are first of all introduced through the reaction chamber in an essentially rectilinear flow which is also parallel; and by the fact that after this the flow of reactive elements is laterally deviated before the endothermic reaction shall have reached its completion.

Italy 495,083

**SYSTEM AND DEVICE FOR THE UTILIZATION OF HEAVY OILS AND OTHER SIMILAR ECONOMICAL LIQUID FUELS, IN STOVES & EQUIVALENT APPARATUS FOR HEATING, ESPECIALLY FOR DOMESTIC USE**

Luigi Lucchini, Suzzara, Italy

*Filed on Dec. 6, 1952; granted June 7, 1954.*

Cl. XVII

The invention concerns a system for the use of heavy oils, and other similar liquid fuels which are economically supplied, in stoves and equivalent apparatus for heating, characterized by the fact that it consists of inducing the gradual descent of the said liquid fuel, in a substantially continuous form, preventively heated by using the same heat produced by combustion in the combustion chamber of a heating apparatus of the indicated type; by the fall; and in particular by the draining of the liquid fuel down onto a solid superheated element inside the said chamber; and of using the combustibility of the vapors which develop from the said fuel for purposes of a preexisting thermal elevation of the atmosphere for the continuation of combustion using only the said liquid fuel.

Italy 497,955

## PROCESS FOR THE ENRICHMENT OF PRODUCER GAS

Heurtey &amp; Cie. Société à r. l., Paris, France

*Filed Jan. 7, 1953; granted Sept. 27, 1954.**Application filed in France Jan. 8, 1952.*

Cl. XVII

The invention concerns a process for the enrichment of water gas, characterized by the fact that a reintroduction is effected into the apparatus for the gasification of the oily products which result from the purification of the said gas, carbureted water gas, or carbureted whole gas.

Italy 498,306

## IMPROVEMENT IN THE PROCESS AND APPARATUS FOR THE EXTRACTION OF GAS, OIL, AND COAL FROM BITUMINOUS AND PYROBITUMINOUS ROCKS

Antonio Luiz De Souza Mello, Rio de Janeiro, Brazil

*Application filed Nov. 6, 1951; granted Sept. 29, 1954.*

Cl. XVII

The invention concerns improvements introduced in the process and apparatus for the extraction of gas, oils, and coals from bituminous or pyrobituminous rocks, which are the subjects of invention patent filed under No. 50,535 and already patented, characterized by the fact that the retort has a rotating motion, or some other type of motion [and that] the retort, constructed of iron or another material can be placed in any of the following positions: vertical, horizontal, or slanting.

Italy 498,578

## CLOSURE DEVICE FOR VERTICAL CHAMBERS OF OVENS FOR THE PRODUCTION OF GAS AND COKE

Didier-Werke A. G., Wiesbaden, Germany

*Application filed Sept. 29, 1952; granted Sept. 30, 1954.**Application D 11450 filed in Germany Jan. 26, 1952.*

Cl. XVII

The invention concerns a closure device for chambers of vertical ovens for furnaces for the production of gas and coke, characterized by the fact that the device includes a closure and conveyor cap arranged in the lower opening of the chamber extending inside the chamber as far as the height of the heating draft, or almost as far as the said height, and withdrawable toward a frontal side of the chamber horizontally; and a closure cap of a known type applied below the opening of the chamber and closing off the gas contents thereof.

Italy 501,081

## PROCESS FOR THE PRODUCTION OF GAS OF A HIGH CALORIFIC VALUE ACCORDING TO THE SLAG CIRCULATION METHOD

Union Rheinische Braunkohlen Kraftstoff A.G., Wesseling, Germany

*Application filed May 22, 1953; granted Nov. 22, 1954.**Application U 1697 filed in Germany June 19, 1952.*

Cl. XVII

The invention concerns a process for the gasification of fuels in their own liquid slag conducted in circulation, in which the processes of gasification and heating are divided by means of regulating the adduction of the fuel, of the gasification media which react exothermically and those which react endothermically, in the circulation of the slag; characterized by the fact that, in order to produce gas of high calorific value and a low nitrogen content, for example of the town-gas or pipeline-gas type, or for the production of gas with as high a nonsaturated hydrocarbons content as possible, the gases formed in the endothermic gasification space are enriched with hydrocarbons.

Italy 502,276

## DEVICE FOR THE GASIFICATION OF SOLID FUELS

Heinrich Koppers G.m.b.H., Essen, Germany

*Application filed July 15, 1953; granted Nov. 29, 1954.**Application K 14958 filed in Germany July 26, 1952.*

Cl. XVII

The invention concerns a device for the gasification of pulverized solid fuels in suspension using oxygen or air with a high oxygen content, in which a mixture of fuel and oxygen formed previously is blown into a reaction chamber maintained at a high temperature, through a pipe, for example a nozzle emptying into the said chamber; characterized by the fact that a device for measuring pressure is connected to the pipe for injecting the mixture, the said device operating in response to acoustical and optical signals and possibly to organs for closure and for the regulation of the adduction of the reaction materials.

Italy 502,828

## PROCESS FOR THE PRODUCTION OF PURIFIED GENERATOR GAS WITH A HIGH CALORIFIC VALUE, AND APPLICATION OF THE SAID PROCESS TO THE FEEDING OF FURNACES SUCH AS MARTIN FURNACES

Louis Marie Charles Heurtey and Paul Octave André Heurtey, Paris, France

*Filed Dec. 22, 1952; granted Dec. 1, 1954.**Application PV 621,236 filed in France Dec. 22, 1951.*

Cl. XVII

The invention concerns a process for the production of purified generator gas of high calorific value, characterized by the fact that the gas generator is fed with high mineral coal kept in thick layers above the reaction zone, and that the gas produced by the condensable elements, oily products, and tars, is removed in a purification installation before sending it on for utilization, the condensed products supplied by the installation being returned to the gas generator.

Italy 503,719

## DEVICE FOR THE GASIFICATION OF PULVERIZED SOLID FUELS

Heinrich Koppers G.m.b.H., Essen, Germany

*Application filed Apr. 22, 1953; granted Dec. 7, 1954.**Application K 14,073 filed in Germany May 2, 1952.*

Cl. XVII

The invention concerns a device for the gasification of pulverized solid fuels in a reaction chamber into which is introduced a mixture of fuel dusts and oxygen, by means of a series of injectors, to each of which a fractionation and mixing device is connected; characterized by the fact that the individual fractionating and mixing devices of the injectors are joined with a sole feeding device for all the closure organs, into which the storage tank of the fuel dusts opens, by means of closure organs in which the closure occurs automatically through a corresponding denseness of the fuel dusts.

Italy 504,846

## PROCESS AND DEVICE FOR THE COMBUSTION OF OR GASIFICATION OF FUELS

Union Rheinische Braunkohlen Kraftstoff A. G., Wesseling, Germany, and Roman Rummel, Brühl, Germany

*Application filed July 15, 1953; granted Dec. 14, 1954.**Application U 1819 filed in Germany Aug. 21, 1952.*

Cl. XVII

The invention concerns a process for the combustion or gasification of fuels in a bath of circulating slag through the effect of the energy of the flow of combustion air or of the gasification medium; characterized by the fact that the fuel is burned or gasified

in a deep vortex of slag, while the newly formed slag flows through it continuously.

Italy 506,374

**PROCESS AND INSTALLATION FOR THE PRODUCTION OF WHOLE GAS WITH OIL CARBURETION OF SOLID FUELS**

Othmar Wagner, Milan, Italy

*Application filed May 13, 1953; granted*

*Dec. 22, 1954.*

*Cl. XVII*

The invention concerns a process for the production of whole gas with oil carburetion of solid fuels during which process water gas is produced in a generator and carburetion is effected in a carburetor characterized by the fact that a partial flow of water gas produced in the generator is conducted through the distillation retort of the said generator, while a second partial flow is deviated and conducted toward the carburetor, in which carburetion takes place, the gas thus formed and having a high calorific value being mixed, after having been fixed and cooled by scrubbing, in the production cycle with the whole gas emerging from the distillation retort, thus forming the oil-carbureted gas as a mixed gas from the two partial flows.

Italy 507,410

**PROCESS FOR THE CONVERSION OF LIQUID HYDROCARBONS, WITH PARTICULAR REFERENCE TO OIL GASES, TAR GASES, AND THE LIKE**

Ruhrgas A.G., Essen, Germany

*Application filed July 2, 1953; granted Dec. 30, 1954.*

*Application R 9453 filed in Germany July 10, 1952.*

*Cl. XVII*

The invention concerns a process for the conversion of hydrocarbons in which the necessary heat is supplied in whole or in part from outside, for example, through the walls of a reactor, or by means of solid heat carriers introduced into the said reactor, and in which, if the heat is supplied in part from outside, the remaining heat required is produced by means of chemical reactions with gasification agents such as, for example, water vapor, gases containing oxygen, or the end-gases produced; characterized by the fact that the hydrocarbons are conveyed along heat-yielding surfaces with a high linear flow velocity and, specifically,

at a velocity which increases proportionately as the reaction temperature drops, the velocity curve of minimum linear flow applied as a function of the reaction temperature being preferably such as to exceed the values of 100 meters per second at 500° C., and 1 meter per second at 1,000° C., while between these values, operation continues of a parabolic nature.

Italy 508,005

**METHOD FOR THE GASIFICATION OF LIQUID FUELS AND DEVICE RELATIVE THERETO, FOR FEEDING THERMIC ENGINES, BURNERS, AND THE LIKE WITH SUCH GASES**

Angelo Agnelli and Giovanni Duccoli, Bergamo, Italy

*Application filed Apr. 4, 1953; granted Jan. 4, 1955.*

*Cl. XVII*

The invention concerns a method for the gasification of liquid fuels, and the device relative thereto, for use in heat engines, burners, and the like, consisting in the fact that the engines, burners, and the like are supplied with fuel gas, whereby the said gas is obtained directly from the liquid fuel drawn through filtering vegetal, mineral, and synthetic porous and absorptive membranes, in the form of microscopic particles which, upon contact with the air, are rapidly transformed into fuel gas, the said gas, purified and filtered through additional membranes, exercising in the meanwhile a specific slow action.

Italy 508,543

**DEVICE FOR THE GASIFICATION BY SUSPENSION OF PULVERIZED FUELS**

Heinrich Koppers G.m.b.H., Essen, Germany

*Application filed on July 14, 1953; granted on Jan. 10,*

*1955. Application K. 14,937 filed in Germany July 25, 1952.*

*Cl. XVII*

The invention concerns a device for the production of gas containing carbon monoxide and possibly hydrogen, through the reaction of pulverized fuels kept in suspension with oxygen and possibly with continuous gasification by endothermic reaction; characterized by the fact that, as an opening for the outlet of the useful gas generated by the reaction chamber constructed of a refractory brickwork, there is provided a metal pipe projecting into the inside of the said chamber and equipped with a cooling casing.

# SWEDISH PATENTS

Sweden 121,737

## METHOD OF OBTAINING OIL FROM SHALE AND THE LIKE IN SITU

F. Ljungström. Svenska Skifferolje a.-b., Örebro, Sweden  
*Apr. 1, 1948; application filed Oct. 28, 1940. Published May 25, 1948.*  
*Cl. 5 a:41*

The present invention concerns a method of obtaining oil from shale and the like in situ by means of canals traversing strata, to which canals heat is added for heating the shale, and which are separated from outlet canals formed in the shale between parts thereof; characterized by the fact that a heating element is lowered in the heating canals, which are preferably heated by electricity, and the cross section area of which is smaller than that of the canals; and that in the intervening space between the canal wall and the heating unit, a filling mass is applied which transmits heat between the heating unit and the shale and at the same time counteracts and/or prevents the outward flow of the gasified oil products towards and along the heating unit.

Sweden 123,136

## PROCESS AND ARRANGEMENT FOR THE THERMO-ELECTRIC OBTAINING OF SHALE OIL

F. Ljungström. Svenska Skifferolje a.-b., Örebro, Sweden  
*Sept. 9, 1948; application filed Dec. 4, 1941. Published Nov. 9, 1948.*  
*Cl. 5 a:41*

The invention concerns a process for producing oil from shale, characterized by the fact that electric resistance is introduced into a tube-shaped protective cover, which is lowered into a hole in the shale; and by the fact that the intervening space existing between the protective cover and the wall surface of the hole is filled with a pulverized or granular material, such as sand.

Sweden 123,137

## ARRANGEMENT FOR CONVEYING OF GASIFICATION HEAT INTO SHALE ROCK BY MEANS OF TUBULAR, CLOSED CONTAINERS LOWERED INTO THE SAID SHALE

F. Ljungström. Svenska Skifferolje a.-b., Örebro, Sweden  
*Sept. 9, 1948; application filed Feb. 23, 1943. Published Nov. 9, 1948.*  
*Cl. 5 a:41*

The invention concerns an arrangement for conveying of gasification heat into shale rock by means of tubular, closed containers lowered into the said shale; characterized by the fact that at least one gas-conveying and at least one air-conveying pipe are partially introduced into the container, of which the gas pipe or pipes have outlets, each at a different altitude level within the part of the container which is surrounded by the shale rock; and by the fact that the air pipe is inserted down inside the container and has its outlet at the lower part of the container in such fashion that more combustion zones are produced along the mentioned part of the container for the gas combustion.

Sweden 123,138

## PROCESS FOR THE GASIFICATION OF SHALE ROCK IN SITU CONTAINING OIL BY THE INTRODUCTION OF HEAT THROUGH CANALS IN THE SHALE ROCK

Svenska Skifferolje a.-b., Örebro, Sweden  
*Sept. 9, 1948; application filed Jan. 30, 1945. Published Nov. 9, 1948.*  
*Cl. 5 a:41*

The invention concerns a process for the gasification of shale rock in situ containing oil by the introduction of heat through canals in the shale rock; characterized by the fact that when, later on, a part of the shale has been degasified by means of pyrolysis and has become porous, gas is fed into this part while it is still warm by means of canals in the shale which are other than the canals for adding heat; and by the fact that this gas is of such nature that it is hereby subjected to chemical reactions without combustion, with the shale rock serving as a catalyst.

Sweden 129,838

## PROCESS AND DEVICE FOR OBTAINING OIL FROM SHALE

F. Ljungström. Svenska Skifferolje a.-b., Örebro, Sweden  
*Aug. 17, 1950; application filed Dec. 10, 1941.*  
*Published Oct. 24, 1950.*  
*Cl. 5 b:42 01*

The invention concerns a process for extracting oil from shale, characterized by the fact that the shale is first heated by a flow of hot gas or liquid, and after this by electric energy until dry distillation temperature is reached.

Sweden 130,291

## PROCESS FOR OBTAINING USEFUL, IMMEDIATELY INFLAMMABLE GASES THROUGH THE GASIFICATION OF SUBTERRANEAN FUEL STRATA IN SITU

F. Ljungström. Svenska Skifferolje a.-b., Örebro, Sweden  
*Oct. 5, 1950; application filed Sept. 30, 1946.*  
*Published Dec. 12, 1950.*  
*Cl. 5b:42 01*

The invention concerns a process for obtaining useful, immediately inflammable gases through the gasification of subterranean fuel strata; characterized by the fact that a lesser portion of the fuel stratum is electrically heated, thus being converted to the condition of a diffusible gas, after which this part is used to pipe the oxygen (air) through the fuel stratum as well as to provide an outlet for the gases generated by burning the remaining parts of the fuel strata.

Sweden 132,991

## PROCESS FOR THE DEGASIFYING OF FUEL-CONTAINING STRATA, SUCH AS SHALE BEDS, IN SITU

F. Ljungström. Svenska Skifferolje a.-b., Örebro, Sweden  
*July 5, 1951; application filed Dec. 19, 1946.*  
*Published Sept. 25, 1951.*  
*Cl. 5b:42/01*

The invention concerns a process for the degasifying of fuel-containing strata, such as shale beds, in situ, by means of drilled channels through which heat is fed to the strata, and from there by means of separate offtake channels to exhaust the gases generated; characterized by the fact that the various channels are uniformly distributed over the ground surface so that the number of heat-supplying channels shall be at least three times the number of offtake channels.





# INVENTORS AND ASSIGNEES

Bel.=Belgium; Fe.=French; Ger.=German; It.=Italian; Swe.=Swedish]

## A

|  | <i>Patent No.</i>         |
|--|---------------------------|
| Adolphe Saurer (Société Anonyme)-----                                      | Fe. 890,569               |
| Aerogen Company Limited (The)-----   | Fe. 1,052,823             |
| Agnelli, Angelo-----   | It. 508,005               |
| Air Liquide (Société Anonyme pour<br>L'Etude et L'Exploitation-des prodes) | Bel. 509,315              |
| Air Reduction Co., Inc.-----   | Bel. 397,899, Fe. 759,246 |
| Alexandre, Armand-----   | Fe. 872,972               |
| Alfa, Romeo Milano Napoli-----   | Fe. 893,344               |
| Alfa-Romeo (Société Anonyme)-----  | Fe. 846,113               |
| Allgemeine Staubvergasungs<br>(G.m.b.H.).                                  | Ger. 616,466,             |
| Allgemeine Vergasungs (G.m.b.H.)-----                                      | Ger. 619,638              |
| Allied Chemical & Dye Corp-----  | Ger. 455,066              |
| Fe. 1,023,915  | Fe. 1,023,915             |
| Fe. 1,076,911, Ger. 847,945,   | It. 475,422,              |
| It. 476,716, It. 490,690.  |                           |
| Allner, Woldemar-----  | Ger. 659,956              |
| Altstaedt, Werner-----   | Ger. 859,191              |
| American Magnesium Metals Corp-----  | It. 430,009               |
| Ammonia Casale Società Anonima-----  | Bel. 508,602              |
| Ammoniaque Synthétique et Dérivés--  | Bel. 407,446,             |
|  | Fe. 895,765               |
| Anciens Etablissements Loy & Aube,<br>S. A.                                | Fe. 506,129,              |
| Fe. 512,048,   | Fe. 536,047               |
| Andrews and Co., Ltd-----  | Fe. 562,097               |
| Andrews, Charles Woodward-----   | Fe. 625,258               |
| Anglo-Transvaal Consolidated Invest-<br>ment Co., Ltd-----                 | Ger. 823,015              |
| Appareils de Manutention et Fours<br>Stein (Société Anonyme des)-----      | Fe. 583,937               |
| Arnemann, Conrad-----  | Ger. 458,879              |
| Arnolds, Bernhard-----   | Ger. 912,612              |
| Arnold, Michael Henry Miller-----  | Fe. 920,290,              |
| Fe. 940,694, Fe. 940,695   | Fe. 940,695               |
| Ateliers des Charmilles (S.A.)-----  | It. 485,813               |
| Ateliers Generaux de Construction<br>(Société Anonyme des)-----            | Bel. 376,567              |

## B

|  |   |
|--|---|
| Babin, Jules-----                              | Ger. 395,648                                      |
| Babcock & Wilcox Co. (The)-----                | Bel. 462,362,                                     |
| Bel. 517,525, Fe. 1,074,822,                   | Ger. 801,214,                                     |
| Badische Anilin- & Soda-Fabrik-----            | Ger. 808,058, Ger. 818,825, Ger. 819,713,         |
| Ger. 859,191, Ger. 869,839, Ger. 879,139,      | It. 470,714, It. 473,752, It. 479,241.            |
| Badische Anilin- & Soda-Fabrik-----            | Fe. 995,952,                                      |
| Fe. 996,260, Fe. 997,777, Fe. 1,029,152, Fe.   | 1,030,319, Fe. 1,046,028, Fe. 1,069,244, Fe.      |
| 1,073,105, Ger. 882,454, Ger. 899,540, Ger.    | 899,541, Ger. 907,921, Ger. 907,335, Ger.         |
| 911,886, Ger. 917,806, Ger. 919,004.           |   |
| Bähr, Dr. Hans-----                            | Ger. 696,026, Ger. 879,139                        |
| Ballingall, James Mackay-----                  | Fe. 714,880                                       |
| Ballu, Louis-Henri-----                        | Fe. 886,668                                       |
| Bamag-Meguïn A. G.-----                        | Ger. 450,326, Ger. 460,759,                       |
| Ger. 479,028, Ger. 486,557, Ger. 495,371, Ger. | 520,739, Ger. 543,001, Ger. 571,400, It. 385,729. |
| Bamag-Meguïn A. G.-----                        | Fe. 604,810, Fe. 640,216,                         |
| Fe. 669,763, Fe. 761,506, Ger. 589,129, Ger.   | 594,095, Ger. 653,943, Ger. 663,335, Ger.         |
| 672,543, Ger. 672,721, Ger. 729,063.           |   |

|  | <i>Patent No.</i>                                  |
|--|--|
| Bamag-Werke für Eisenverarbeitung<br>A. G.           | Ger. 803,067,<br>Ger. 823,474                      |
| Bansen, Hugo-----                                    | Fe. 514,299  |
| Bartha, Erich-----                                   | Ger. 823,316                                       |
| Bartholome, Dr. Ernst-----                           | Ger. 859,191                                       |
| Bastin, Émile-----                                   | Fe. 515,181  |
| Batigne, Pierre-----                                 | Fe. 499,881  |
| Bava, Giuseppe-----                                  | It. 409,983  |
| Bayetto, Alfred-----                                 | Fe. 872,580, Fe. 885,033                           |
| Beaudequin, Paul-----                                | Fe. 487,894, Fe. 516,819,                          |
| Fe. 577,390, Fe. 638,529, Fe. 741,777                | Fe. 741,777  |
| Bechevot, Albert-----                                | Fe. 829,218  |
| Beha, Ernest Pierre-----                             | Fe. 484,973  |
| Beldent, Henri-----                                  | Fe. 977,488  |
| Bellay, Julien-----                                  | Fe. 638,741  |
| Berg, Werner Alfred Paul---                          | Fe. 556,456, Ger. 391,936                          |
| Berger, Alfons-----                                  | Fe. 590,111  |
| Berger, Paul-----                                    | Ger. 568,851                                       |
| Bergfeld, Karl-----                                  | Bel. 442,455,                                      |
| Fe. 874,566, Ger. 614,607, It. 396,368               | Ger. 865,898                                       |
| Bergwerksgesellschaft Hibernia A. G.--               | Ger. 392,338,                                      |
| Berlin-Anhaltische Maschinenbau A. G.--              | Ger. 400,149                                       |
| Berlin-Burger Eisenwerk A. G.-----                   | Ger. 386,484                                       |
| Bernard, Etienne-----                                | Fe. 864,766, It. 382,452                           |
| Bernard, René-----                                   | Fe. 864,766, It. 382,452                           |
| Berry, A. G.-----                                    | Bel. 424,183                                       |
| Bessieux, Maurice-----                               | Fe. 1,037,697                                      |
| Bethenod, Joseph-----                                | Fe. 839,391, Fe. 873,624                           |
| Bianchi, Lino-----                                   | It. 428,883  |
| Bieger, Dr. Franz-----                               | Ger. 912,612                                       |
| Bigot, Fried-----                                    | Fe. 625,732  |
| Birkner, Max-----                                    | Ger. 431,136,                                      |
| Ger. 437,914, Ger. 934,662                           | Fe. 560,163  |
| Blérald, Stephen-----                                | Ger. 510,351, Ger. 622,945,                        |
| Bleyer, Carl-----                                    | Ger. 645,368, Ger. 685,975, Fe. 800,785            |
| Bogiet, Alfred-----                                  | Fe. 742,514  |
| Bolz, Christian-----                                 | Ger. 589,766                                       |
| Bolzinger, Antoine-----                              | Fe. 1,032,897                                      |
| Bonnechaux, Georges, Louis, Émile,<br>Edouard-----   | Fe. 865,834  |
| Bonneville, Roger-----                               | Fe. 1,038,287                                      |
| Bormann, Aline (née Baceumcher)-----                 | Ger. 284,702                                       |
| Bossner, Franz-----                                  | Bel. 379,412, Fe. 812,877                          |
| Bouchet, René-----                                   | Fe. 587,277  |
| Boulanger, L.-----                                   | Bel. 420,504                                       |
| Bouriez, Émile-Jules-----                            | Fe. 878,884, Fe. 886,955                           |
| Bouilloux-Lafont, Andre-----                         | Fe. 881,509  |
| Bouteille, Joseph-----                               | Fe. 840,014, Fe. 873,624                           |
| Bratto, Giuseppe-----                                | It. 385,732  |
| Braunkohlen-Benzin A. G.-----                        | Ger. 912,612                                       |
| Braunkohlen-und Brikett-Industrie<br>A. G.-----      | Ger. 622,848,                                      |
| Ger. 636,762, Ger. 659,956, Ger. 684,662             | Ger. 531,634, Ger. 353,009,                        |
| Breisig, Albert-----                                 | Fe. 551,973, Fe. 566,812, Fe. 655,622, Fe. 696,696 |
| Breitkopf, Edmund-----                               | Ger. 334,872                                       |
| Brennstoffvergasung (Aktiengesellschaft<br>für)----- | Ger. 333,789, Ger. 337,853, Ger. 338,192,          |
| Ger. 343,048, Ger. 344,855, Ger. 345,817             | Fe. 894,811  |
| Brennstoff, Technik G.m.b.H.-----                    |  |

|   | <i>Patent No.</i>  |   | <i>Patent No.</i>   |
|---|--|---|---|
| Bresciani, Giuseppe   | It. 397,891  | Continentrale pour la Fabrication des                     |   |
| Breuilé, Pierre   | Fe. 560,163, Fe. 581,613   | Compteurs et Autres Appareils                             |   |
| Briest, Joseph-Eugène-Marie   | Fe. 502,737  | (Compagnie Anonyme)                                       | Bel. 367,040,   |
| British Carbonised Fuels, Ltd   | Bel. 396,955   |   | 696,696, Fe.  |
| British Coal Distillation, Ltd  | Bel. 419,822   |   | 709,219, Fe. 845,209  |
| Brodeur, Édouard-Louis-Arthur   | Fe. 759,154  | Copley, Ira Clifton                                       | Fe. 604,658   |
| Brown, Boveri, & Cie. A. G.   | Ger. 917,684   | Coury, Alfred   | Fe. 475,407   |
| Brown, Boveri & Cie. S.A.   | Fe. 932,017  | Couvez, Raphael-Louis                                     | Fe. 992,312   |
| Brownley, Harry   | Ger. 847,945   | Cross, Walter M.  | Fe. 653,424   |
| Bruggemann-Erich  | It. 387,372  | Crush, Ernest Hope  | Fe. 507,490   |
| Burns, William Lindsey  | Bel. 460,968, Bel. 460,969,  |   |   |
|   | Bel. 461,996, Fe. 923,925, It. 457,353                             |   |   |
| Bunzlauer Werke Lengersdorff & Co.                                      | Ger. 340,664   |   |   |
|   |  | <b>D</b>  |   |
| <b>C</b>  |  | Dacosta, Oscar  | Fe. 508,384   |
| Cabany, Pierre  | Fe. 920,498, Fe. 928,779, Fe. 928,780                              | Daimler-Benz A. G.  | Ger. 890,696  |
| Caccioppoli, Lorenzo  | Fe. 852,268  | Dampfkesselfabrik   | Fe. 690,126   |
| C. D. Patents, Ltd  | Fe. 1,050,507  | (formerly Arthur Rodberg, A. G.)                          |   |
| Carbonite (La)  | Fe. 693,289  | Danneberg & Quandt  | Ger. 657,242  |
| Carburetted Gas, Inc.   | Bel. 398,773,  | Danon, Henri  | Fe. 536,182   |
|   | Bel. 398,774, Bel. 398,775, Bel. 398,776                           | Danulat, Dr. Friedrich                                    | Ger. 624,169,   |
| Carl, Still (Firma)   | Fe. 742,514  |   | Ger. 700,940, Ger. 912,385  |
| Carl Still (G.m.b.H.)   | Bel. 409,362   | Darche, Albert  | Fe. 869,969   |
| Carlier, Lucien   | Fe. 1,068,501  | Darche, Alexandre   | Fe. 869,969   |
| Carlin, Attilio   | It. 396,731  | Darche, Augustine   | Fe. 869,969   |
| Carlshütte für Eisengiesserei und Maschinenbau                          | Ger. 457,498   | Davies, William Everard                                   | Fe. 517,332,  |
| Carlshütte Maschinen und Stahlbau                                       |  |   | Fe. 562,348   |
| G.m.b.H.  | Fe. 897,433  | de Bartholomeis, Remo                                     | Fe. 517,733,  |
| Cassan, Jean-Henri-Francois   | Fe. 1,042,710  |   | Fe. 517,734   |
| Casseville, Jean  | Fe. 867,722  | Debauche, H.  | Bel. 370,999  |
| Caunt, W. A.  | Bel. 395,924   | de Brouwer, Pierre  | Fe. 751,323   |
| Cazes, Victor-Léon  | Fe. 494,456, Fe. 545,813   | Directive van de Staatsmijnen                             | Fe. 978,750,  |
| C. Eitle Maschinenfabrik  | Fe. 634,855  |   | Fe. 982,611, It. 449,386, It. 452,554, It. 457,924  |
| Cenna, Fernando   | It. 408,699  |   | It. 468,471   |
| Cervera, Vincente   | Fe. 482,305  | D'Electricité et de Mécanique Procédés                    |   |
| Cesbron, Paul   | It. 420,854  | Thomas-Huston. (Société)                                  | Bel. 439,398  |
| Cézanne, Robert-Marie-Albert-Ernest                                     | Fe. 634,396  | De Galocsy, Zsigmond                                      | Ger. 805,901,   |
| Chaffette, M.   | Bel. 387,055, Bel. 387,296   |   | Ger. 816,284, It. 486,502   |
| Chambet, Gultave  | Fe. 561,584  | Deibel dit Delbois, Maurice                               | Fe. 882,579   |
| Chapelant, Jean-Marie   | Fe. 867,425  | de Lacotte, Antoine                                       | Fe. 864,199   |
| Chapman Engineering Co.   | Fe. 491,712  | Dellwick-Fliescher Wassergas G.m.b.H.                     | Fe. 512,598,  |
| Chapman, William Brewster   | Fe. 625,258  |   | Fe. 530,436, Fe. 624,739, Fe. 672,775, Ger.   |
| Charbonnages de France  | Fe. 1,051,761,   |   | 286,600, Ger. 287,252, Ger. 287,616, Ger.   |
|   | Fe. 1,075,25   |   | 350,443, Ger. 357,520   |
| Charpentier, Jean, Frederic, Georges, Marie, Leon                       | Fe. 869,130  | Demag A. G.   | Ger. 811,484,   |
| Chateau, Roger  | Fe. 870,378  |   | Ger. 817,337, It. 469,155, It. 470,807  |
| Chaumard, André   | Fe. 867,425  | Demag, A.G.   | Fe. 858,917,  |
| Chavanne, Louis   | Ger. 567,082, Ger. 584,798, Ger. 587,721, Fe. 590,730, Fe. 597,096 |   | Fe. 858,918, Fe. 997,616, Fe. 999,051, Fe. 1,051,498, Ger. 829,345, Ger. 829,483, Ger. 835,492, Ger. 841,932, Ger. 842,823, Ger. 854,982, Ger. 885,587, Ger. 906,253, Ger. 908,654, Ger. 920,560. |
| Chimique de la Grande Paroisse (Societe)                                | Bel. 511,123, Fe. 1,026,173  | Demart, Pierre  | Fe. 917,451,  |
| Claudé, Charles-Henri   | Fe. 884,620  |   | Fe. 917,452, Fe. 917,453, Fe. 917,454, Fe. 917,455, It. 423,391, It. 426,596, It. 430,889, It. 441,357, It. 442,322, It. 442,327, It. 442,610, It. 917,450.                                       |
| Clayton, Reginald Fitzroy   | Ger. 471,823   | Depuy, H.   | Bel. 387,470  |
| Clemcon, Félix  | Fe. 882,579  | Deschamps, J.   | Bel. 367,784  |
| Cohn, H.  | Bel. 374,656   | Deschaseaux, Marc-Auguste                                 | Fe. 591,505   |
| Colin, Jurion   | Fe. 700,220  | De Souza Mello, Antonio Luiz                              | Lt. 498,306   |
| Collignon, Eduardo  | Ger. 659,978   | Dessauer Vertikal-Ofen G.m.b.H.                           | Fe. 643,965,  |
| Collin & Co. (Firma)  | Ger. 431,267   |   | Fe. 719,662   |
| Combusta, G.m.b.H.  | Fe. 1,081,018  | Dessemond, Auguste  | Fe. 526,311   |
| Combustibles Liquides, Société Internationale des                       | Fe. 630,330  | Deutsche Erdöl A. G.                                      | Ger. 323,588,   |
| Combustion Rationnelle, La  | Fe. 609,340  |   | Ger. 401,686  |
| Conod, Frederic Georges   | Fe. 604,658  | Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler | Bel. 447,237  |
| Construction d'Appareils pour Gaz à l'Eau & Gaz Industriels, Société de | Bel. 525,869, Fe. 628,695, Ger. 492,088, It. 489,670               | Deutsche Koksgas G.m.b.H.                                 | Ger. 468,635  |
| Construction d'Appareils pour Gaz à l'Eau & Gaz Industriels, Société de | Fe. 1,041,820, Fe. 1,076,222, Fe. 1,079,145                        | Deutscher Industrie-Ofengau G.m.b.H.                      | Ger. 327,095  |
| Construction de Fours à Coke (SIMPLEX), Société Anonyme de              | Fe. 550,325  | d'Exploitation des Appareils Rateau (Société)             | Fe. 488,226   |
|   |  | D'Exploitation des Brevets Cousin (Société Anonyme)       | Fe. 577,199, Fe. 646,581  |

|  | <i>Patent No.</i>         |  | <i>Patent No.</i>           |
|--|---------------------------|--|-----------------------------|
| Didier-Werke A. G.-----                          | Fe. 814,963,              | Fives-Lille (Compagnie de)-----                | Fe. 931,267                 |
| Fe. 843,920, Fe. 845,316, Fe. 1,048,633, Ger.    |                           | Fleiser, Bohumil-----                          | Ger. 636,763                |
| 690,303, Ger. 717,449, It. 481,674, It. 482,821, |                           | Flesch, Dr. Wilhelm-----                       | Ger. 801,214,               |
| It. 498,578.                                     |                           | Ger. 811,484, Ger. 817,337, Ger. 829,345, Ger. |                             |
| Didier-Kogag-Hinselmann, Koksofen-               | It. 477,462               | 829,483, Ger. 835,492, Ger. 842,823, Ger.      |                             |
| bau und Gasverwertung A.G.-----                  |                           | 854,982, Ger. 882,454, Ger. 885,587, Ger.      |                             |
| Diena, Giulio-----                               | Fe. 797,065, Ger. 663,025 | 899,540, Ger. 907,921, Ger. 911,886, Ger.      |                             |
| Dieterlen, Henry-----                            | Fe. 696,052               | 917,806, Ger. 919,004.                         |                             |
| Distibois, S. A.-----                            | Fe. 864,199               | Flourine Francaise (La)-----                   | Fe. 680,166                 |
| Doignon, Albert, Émile-----                      | Fe. 868,098               | Florentin, J. M. F. D.-----                    | Bel. 374,669                |
| Dolensky, Eugen-----                             | Fe. 513,285,              | Forni ed Impianti Industriali Ingg. de         |                             |
| Fe. 530,962, Ger. 294,333                        |                           | Bartolomeis-----                               | Bel. 470,025, It. 429,836   |
| Domann, Dr. Friedrich-----                       | Ger. 821,096,             | Forni Industriali Simboli-----                 | Fe. 735,006                 |
| Ger. 871,488, Ger. 867,727                       |                           | Forni ed Impianti Industriali (Sociéta         |                             |
| Dormann, Dr. Otto-----                           | Ger. 369,316              | Anonima)-----                                  | Fe. 853,153,                |
| Drake, Jonas Wilfrid-----                        | Fe. 502,734               | Fe. 853,154, Fe. 853,155, It. 387,239          |                             |
| Drakes Ltd-----                                  | Fe. 502,734               | Fornas, Louis-----                             | Fe. 491,677                 |
| Drawe, Rudolf-----                               | Ger. 500,281,             | Forsans, Pierre-Eugène-Henri-----              | Fe. 609,814,                |
| Ger. 540,316, Ger. 541,049, Ger. 620,392         |                           | Fe. 637,906,                                   | Fe. 733,638                 |
| Dr. C. Otto & Co., G.m.b.H.-----                 | Bel. 382,498,             | Fours et Appariels, S.A.-----                  | Fe. 795,555                 |
| Bel. 421,880, Fe. 723,081, Fe. 818,146, Fe.      |                           | Fourlinnie, August-Marie-----                  | Fe. 652,849                 |
| 846,588, Fe. 875,893, Fe. 1,023,986, Fe.         |                           | Francaise d'Exploitation de Fours              |                             |
| 1,029,608, Fe. 1,068,769, Fe. 1,071,555, Ger.    |                           | Spéciaux à Haute Température                   |                             |
| 490,782, Ger. 524,971, Ger. 571,210, Ger.        |                           | (Société)-----                                 | Fe. 473,149                 |
| 634,074, Ger. 813,870, Ger. 831,293, Ger.        |                           | Francaise de Matériel Agricole et In-          |                             |
| 879,275, Ger. 901,329, Ger. 901,662, Ger.        |                           | dustriel (Société)-----                        | Fe. 524,111                 |
| 916,662, It. 471,328.                            |                           | Francart, Henri-----                           | Fe. 500,521                 |
| Dryon, P-----                                    | Bel. 379,075              | Francis, Charles Blaine.---                    | Bel. 503,223, Fe. 1,042,968 |
| Dubeux, Jean Emile-----                          | Fe. 865,834               | Francke, Werke Komm. A.G-----                  | Ger. 439,875,               |
| Dubrelle, G. E.-----                             | Bel. 385,449              | Ger. 440,893, Ger. 450,075                     |                             |
| Duccoli, Giovanni-----                           | It. 508,005               | Franco-Belge de Fours a Coke, Sociéte          |                             |
| Duckham, Sir Arthur MacDougall.---               | Fe. 534,601,              | S.A.-----                                      | Fe. 523,201                 |
| Fe. 534,634                                      |                           | Francois, Roger-----                           | Fe. 859,774                 |
| Duffield, Frederick Lindley-----                 | Fe. 660,212               | Franke, Hermann-----                           | Ger. 394,696, Ger. 398,881  |
| Dumant, Lucien-----                              | Fe. 974,557               | Franke, Hermann-----                           | Ger. 398,882                |
| Dunkel, Dr. Manfred-----                         | Ger. 501,378              | Frankfurter Gasgesellschaft.---                | Fe. 615,253,                |
| Dupuy, Henri-----                                | Fe. 609,380,              | Fe. 616,985, Fe. 651,638, Ger. 468,095, Ger.   |                             |
| Durand, Paul-Emile-Henri-----                    | Fe. 878,463               | 479,029, Ger. 499,673.                         |                             |
| DuSaugay, H-----                                 | Fe. 889,862               | Frankl, Mathias-----                           | Ger. 427,288, Ger. 514,194  |
| Dvorkovitz, Paul-----                            | Bel. 435,085              | Freyss, Jules-----                             | Fe. 709,219                 |
| Ger. 481,174                                     |                           | Fried, Krupp A.G-----                          | Fe. 803,294                 |

## E

|  |                           |
|--|---------------------------|
| Eastman, Dubois-----                   | Fe. 957,449               |
| Eckardt, August-----                   | Ger. 302,827              |
| Efficient Gas Power Co., Ltd. (The)--- | Fe. 503,072               |
| E. I. Dupont De Nemours & Co.-----     | Fe. 964,242               |
| Ekelund, Sven Carl Gunnar-----         | Fe. 703,560               |
| Elfa Elektrochemische Fabrik AARA U,   |                           |
| Francke-----                           | Fe. 812,536               |
| Erim (S.A.)-----                       | Fe. 885,527               |
| Esteve, Gaston-----                    | Fe. 892,460               |
| Esztergaly, Ferenc-----                | Fe. 957,207               |
| Esztergaly, Francisco-----             | Bel. 479,136, It. 435,357 |
| Etablissements Industriels D. Soulé    |                           |
| (Société Anonyme des)-----             | Fe. 887,762               |
| Etablissements Poulenc Freres-----     | Fe. 509,994               |

## F

|                                       |                            |
|---------------------------------------|----------------------------|
| Fabbrica Italiana Gassogeni Brevetti  |                            |
| Torino Di Ettore-La Manna (S.A.)---   | Fe. 881,446                |
| Fabrication des Compteurs et Matériel |                            |
| d'Usines à Gaz (Compagnie pour la)--- | Fe. 486,773                |
| Faconeisen-Walzwerk L. Mannstaldt &   |                            |
| Cie-----                              | Fe. 514,299                |
| Falconer, Robert-----                 | Ger. 659,978               |
| Fausser, G-----                       | Bel. 521,252               |
| Feiler, Paul-----                     | Ger. 498,225, Ger. 516,655 |
| Ferolite, Ltd-----                    | Fe. 538,581                |
| Feyens, Émile-----                    | Fe. 867,722                |
| Fichet, Anatole-----                  | Fe. 552,877                |
| Fiorelli, Ferinando-----              | Bel. 427,663, It. 384,203  |
| Fischer, Dr. Franz-----               | Ger. 685,291               |
| Fischer, Karl-----                    | Ger. 461,481               |

## G

|   |                           |
|---|---------------------------|
| Gadret, Rene-----                             | Fe. 760,698               |
| Galocsy, Zsigmond-----                        | Fe. 851,885,              |
| It. 404,028, It. 452,566, It. 486,502         |                           |
| Galusha, Albert L-----                        | Fe. 501,200, Fe. 685,638  |
| Gas Chambers & Coke Ovens, Ltd-----           | Bel. 412,861              |
| Gas de France (Service National)---           | Fe. 1,032,897,            |
| Fe. 1,045,563                                 |                           |
| Gasgenerator und Braunkohleverwer-            |                           |
| tung- G.m.b.H.-----                           | Ger. 358,311              |
| Gaserzeuger, Hans Lutz-----                   | Fe. 956,298               |
| Gas Machinery Company (The)-----              | Fe. 991,076,              |
| Fe. 1,035,753, It. 476,276, It. 478,109       |                           |
| Gas- und Teer-G.m.b.H.-----                   | Fe. 659,426,              |
| Fe. 659,427, Ger. 467,561, Ger. 471,328, Ger. |                           |
| 471,329, Ger. 499,305, Ger. 516,786, Ger.     |                           |
| 583,415.                                      |                           |
| Gaswerk Leopoldau-----                        | Bel. 379,412              |
| Gaswerk Simmering-----                        | Bel. 379,412              |
| Gatel, Louis-----                             | Fe. 882,579               |
| Gaucher, Leon P-----                          | Fe. 957,449               |
| Gauger & Co., A.G-----                        | Fe. 884,525               |
| Gazan, M. H.-----                             | Bel. 437,631              |
| Gaz de France-----                            | Fe. 1,032,897             |
| Gaz Industriel (La)-----                      | Fe. 727,523               |
| Gazogenes, Imbert (Les)-----                  | Fe. 976,025               |
| Geipert, Rudolf-----                          | Fe. 584,677, Ger. 446,346 |
| Geissen, Carl-----                            | Fe. 809,313, Ger. 586,182 |
| Geissen, Karl-----                            | Fe. 673,060               |
| Gelsenkirchener Bergwerks A.G-----            | Bel. 434,042              |
| General Carbonalpha Co. (The)-----            | Bel. 378,673              |

|   | <i>Patent No.</i>                     |  | <i>Patent No.</i>            |
|---|---------------------------------------|--|------------------------------|
| Générale de Construction de Fours (Compagnie)-----    | Fe. 486,567,                          | Heinrich Koppers Industrielle Maatschappij N. V.-----                                      | Fe. 810,012, Fe. 853,510     |
| Fe. 548,601, Fe. 563,582, Fe. 1,042,710, It. 421,845. |                                       | Helbronner, André-----   | Fe. 525,068                  |
| Générale De Gazogenes Imbert (Compagnie)-----         | Fe. 700,081                           | Heller, Oswald-----  | Fe. 669,763,                 |
| Georges, Henry-----                                   | Fe. 866,919                           | Ger. 520,739, Ger. 543,001   |                              |
| Georgs-Marien-Bergwerks und Hütten-Verein A. G.-----  | Fe. 529,887                           | Heller, Max-----   | Fe. 672,164, Ger. 531,208    |
| Gérard, Celeste-----                                  | Fe. 574,382                           | Hellwig, Fernand-----  | Fe. 1,076,369, Fe. 1,082,261 |
| Gerdes, Curt-----                                     | Ger. 688,090, Ger. 690,065            | Henry Balfour & Co., Ltd-----  | It. 457,353                  |
| Gerhardt, Ludwig-----                                 | Ger. 446,190                          | Hercules Powder Co-----  | Bel. 463,234                 |
| Ghelfi, Salvatore-----                                | It. 426,163, It. 435,648              | Hereng, A. J. A-----   | Bel. 371,946, Bel. 380,106   |
| Gibson, James Waite-----                              | Bel. 460,968                          | Héreng, Alfred-Jean-André-----   | Fe. 506,278                  |
| Bel. 460,969, Bel. 461,996, Fe. 923,925, It. 457,353. |                                       | Fe. 693,722, Ger. 570,295  |                              |
| Glasgow, Arthur Graham-----                           | Fe. 606,268,                          | Hereng, Maurice-Henri-----   | Fe. 618,552                  |
| Fe. 614,310, Ger. 291,279                             |                                       | Fe. 721,943, Fe. 722,308   |                              |
| Gloth, Dr. Hans Waldemar-----                         | Ger. 819,713                          | Herglotz, Franc-----   | Ger. 530,064,                |
| Glover, Samuel-----                                   | Fe. 480,249                           | Ger. 543,592, Ger. 549,320, Ger. 580,526   |                              |
| Goebel, Max-----                                      | Ger. 813,870, Ger. 879,275            | Heumez, Paul-----  | Fe. 649,927                  |
| Goeltz, Hermann-----                                  | Fe. 544,217                           | Heurtey & Cie-----   | Bel. 516,699,                |
| Ger. 341,394, Ger. 366,469                            |                                       | Fe. 888,170, Fe. 928,636, Fe. 986,499,   |                              |
| Goerz, Willy-----                                     | Fe. 681,816                           | Fe. 1,047,599, It. 497,955.  |                              |
| Goffin, Ernst-----                                    | Fe. 578,071                           | Heurtey, Louis, Marie Charles and Paul, Octave, André-----                                 | Fe. 1,049,621,               |
| Gohin, Jean-----                                      | Fe. 509,994, Fe. 879,739              | Fe. 1,054,275, It. 502,828   |                              |
| Goldsmid-Abrahams, Ernest-----                        | Fe. 519,726                           | Heurtey et Sauvageon Société en Nom Collectif-----   | Fe. 548,428, Fe. 588,419     |
| Grasso, D. J. B-----                                  | Bel. 470,238                          | Heurtey, René-----   | Fe. 616,540                  |
| Greco, Guido-----                                     | It. 446,318                           | Heyn, Dr. Myron-----   | Ger. 501,378                 |
| Green, Frank C-----                                   | Ger. 559,454                          | Hiby, Walthor-----   | Fe. 656,062                  |
| Griggs, A. R-----                                     | Bel. 386,469,                         | Hilger, Ernst-----   | Fe. 522,315                  |
| Fe. 696,082, Fe. 706,341, Fe. 724,316                 |                                       | Hilker, Carl-----  | Ger. 439,011                 |
| Gross, Otto-----                                      | Fe. 650,475                           | Hillebrand, Hermann-----   | Ger. 422,999,                |
| Gross, Dr. Walter-----                                | Ger. 577,725, Ger. 693,432            | Ger. 471,328, Ger. 471,329, Ger. 503,410,  |                              |
| Grossmann, Paul-----                                  | Ger. 488,252                          | Ger. 516,786, Ger. 586,786, Ger. 531,822,  |                              |
| Grote, Wolfgang-----                                  | Ger. 501,378                          | Ger. 534,660, Ger. 703,747.  |                              |
| Groth, Wilhelm-----                                   | Fe. 846,181                           | Hinselmann, Gebr-----  | Ger. 333,716                 |
| Gruber, Herbert-----                                  | Ger. 846,269                          | Hinze, Fritz-----  | Ger. 447,558                 |
| Guardabassi, Galileo-----                             | It. 386,577                           | Hiorth, Albert-----  | Ger. 382,612                 |
| Guignard, Paul-----                                   | Fe. 878,718                           | Hird, H. P-----  | Bel. 396,955                 |
| Guillotini, Ernest-----                               | Fe. 868,260, Fe. 870,056              | Hofmann, Dr. Fritz-----  | Ger. 501,378                 |
| Gumz, Louis-----                                      | Ger. 378,389                          | Hoffmann, Wilhelm-----   | Ger. 387,292                 |
| Gussow, Ernst-----                                    | Fe. 888,463, It. 407,726              | Holden, Thomas Francis-----  | Fe. 585,741, Fe. 585,742     |
| Gustloff-Werke-----                                   | Fe. 869,522, Fe. 889,096, It. 388,381 | Holford, H. J-----   | Bel. 406,999                 |
| Gutehoffnungshütte Oberhausen A. G.-----              | Fe. 1,050,923, Ger. 873,434.          | Hollier-Larousse, Roger Louis Jules-----   | Fe. 858,692                  |
|   |                                       | Holzhausen, August-----  | Ger. 373,927                 |
|   |                                       | Horak, Wilhelm-----  | Fe. 928,646                  |
|   |                                       | Horta, Jair Alves-----   | It. 469,016                  |
|   |                                       | Houyez, Juan-Eugene-Desire-----  | Fe. 877,186,                 |
|   |                                       |  | Fe. 941,105.                 |
|   |                                       | Huard, F. P-----   | Bel. 390,577, Bel. 390,578   |
|   |                                       | Hubert, Edmond-----  | Fe. 649,927                  |
|   |                                       | Hubmann, Dr. Otto-----   | Ger. 560,782,                |
|   |                                       | Ger. 576,134, Ger. 592,223, Ger. 645,477,  |                              |
|   |                                       | Ger. 828,427, Ger. 865,624, Ger. 906,969.  |                              |
|   |                                       | Hudler, Joseph-----  | Ger. 533,021                 |
|   |                                       | Hug, Henry-----  | Fe. 569,524                  |
|   |                                       | Humboldt-Deutzmotoren A. G-----  | Fe. 732,918,                 |
|   |                                       | Fe. 740,432, Ger. 664,524  |                              |
|   |                                       | Humphreys & Glasgow, Ltd-----  | Bel. 386,469,                |
|   |                                       | Fe. 534,249, Fe. 550,930, Fe. 573,145, Fe. 573,175, Fe. 574,183, Fe. 581,838, Fe. 587,850, |                              |
|   |                                       | Fe. 595,418, Fe. 595,957, Fe. 606,364, Fe. 614,310,  |                              |
|   |                                       | Fe. 625,526, Fe. 627,757, Fe. 628,175, Fe. 664,969, Fe. 658,744, Fe. 659,699, Fe. 682,275, |                              |
|   |                                       | Fe. 682,701, Fe. 682,749, Fe. 682,993, Fe. 684,855, Fe. 685,161, Fe. 689,969, Fe. 690,302, |                              |
|   |                                       | Fe. 690,356, Fe. 690,533, Fe. 690,798, Fe. 690,868, Fe. 693,105, Fe. 696,082, Fe. 700,929. |                              |
|   |                                       | Fe. 701,312, Fe. 701,313, Fe. 705,144, Fe. 706,041, Fe. 706,042, Fe. 706,341, Fe. 707,230, |                              |
|   |                                       | Fe. 708,527, Fe. 716,343, Fe. 716,775, Fe. 723,109, Fe. 724,316, Fe. 724,749, Fe. 727,778, |                              |
|   |                                       | Fe. 728,117, Fe. 730,553, Fe. 743,915, Fe. 749,986, Fe. 758,878, Fe. 767,562, Fe. 852,015, |                              |
|   |                                       | Fe. 852,016, Fe. 863,332, Fe. 942,158, Fe.   |                              |

## H

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|--|--------------------------|
| Haenning, Joseph-Émile-----                          | Fe. 484,973, Fe. 566,178 |
| Hagist, W-----                                       | Ger. 333,676             |
| Halvorsen, Karl B-----                               | Fe. 874,673              |
| Hamburger Gaswerke G.m.b.H-----                      | It. 472,458              |
| Hanappe, Edmond-----                                 | Fe. 555,630              |
| Handelsonderneming (Feynald), N. V.-----             | Fe. 574,760              |
| Hans, A. J. E-----                                   | Bel. 414,501             |
| Hansa-Gas-Generatoren G.m.b.H-----                   | Fe. 855,218,             |
| Ger. 657,028, Ger. 718,340, It. 385,261              |                          |
| Hardrich, Wilhelm-----                               | Ger. 659,934             |
| Hardy, Alfred-----                                   | Fe. 1,068,501            |
| Hasche, Rudolph Leonard-----                         | Fe. 1,034,502,           |
| Fe. 1,051,417  |                          |
| Hebel, Hermann-----                                  | Ger. 558,140             |
| Heinrich Koppers-----                                | Bel. 501,930,            |
| Bel. 503,241, Bel. 503,577, Bel. 512,251,            |                          |
| Bel. 519,600, Bel. 534,409, Fe. 903,203,             |                          |
| Fe. 1,029,308, Fe. 1,035,759, Fe. 1,038,810,         |                          |
| Fe. 1,041,773, Fe. 1,046,535, Fe. 1,049,463,         |                          |
| Fe. 1,050,448, Fe. 1,073,523, Fe. 1,080,980,         |                          |
| Fe. 1,080,981, Ger. 714,748, Ger. 714,961,           |                          |
| Ger. 844,952, Ger. 846,269, Ger. 847,944,            |                          |
| Ger. 864,307, Ger. 893,115, Ger. 897,610,            |                          |
| Ger. 913,810, It. 475,746, It. 482,698, It. 483,713, |                          |
| It. 490,150, It. 491,863, It. 502,276, It. 503,719,  |                          |
| It. 508,543.   |                          |

|   | <i>Patent No.</i>          |   | <i>Patent No.</i>          |
|---|----------------------------|---|----------------------------|
| Humphreys & Glasgow, Ltd.—Continued             |                            | Jentzsch, Willy-----                                | Ger. 396,303               |
| 995,234, Fe. 995,235, Fe. 995,236, Fe. 995,237, |                            | Jequier, L.-----                                    | Bel. 508,602               |
| Fe. 995,238, Fe. 995,239, Fe. 1,046,825,        |                            | Johsrich, Dr. Friedrich-----                        | Ger. 920,560               |
| Fe. 1,065,544, Fe. 1,073,544, Ger. 465,045,     |                            | Joklik, Alois-----                                  | Fe. 1,071,555              |
| Ger. 478,742, Ger. 500,282, Ger. 506,865,       |                            | J. & O. G. Pierson (Society)-----                   | Fe. 484,578,               |
| Ger. 525,220.                                   |                            |   | Fe. 513,506, Fe. 537,545   |
| Humphery, Herbet Alfred-----                    | Fe. 606,334                | Jose, Lucien Jean-----                              | Fe. 865,231                |
| Huneau, Maurice-Felix-----                      | Fe. 538,162                | Josset, Pierre-----                                 | Fe. 975,073                |
| Hunter, Mrs. Charlotte (nee Smith)--            | Fe. 544,308                | Julius Pintsch A. G.-----                           | Fe. 701,598,               |
|   | Fe. 554,476                | Fe. 827,434, Fe. 976,616, Ger. 300,452,             |                            |
| Hurter, Hans-----                               | Ger. 815,518               | Ger. 442,259, Ger. 470,653, Ger. 494,532,           |                            |
|   | Ger. 817,010, Ger. 817,011 | Ger. 494,836, Ger. 503,410, Ger. 506,572,           |                            |
|   |                            | Ger. 531,822, Ger. 534,328, Ger. 534,660,           |                            |
|   |                            | Ger. 688,090, Ger. 690,065.                         |                            |
|   |                            | Jullien, Jacques-----                               | Fe. 871,183, Fe. 884,783   |
| <b>I</b>  |                            |   |                            |
| I.G. Farbenindustrie A. G.-----                 | Fe. 631,948,               | <b>K</b>  |                            |
| Fe. 632,466, Fe. 642,315, Fe. 649,301,          |                            | Kaden, Albert-----                                  | Ger. 462,607               |
| Fe. 668,924, Fe. 669,788, Fe. 669,789,          |                            | Kainscop, D.-----                                   | Bel. 424,934               |
| Fe. 687,883, Fe. 710,117, Fe. 735,236,          |                            | Kaiser, Dr. L.-----                                 | Bel. 416,456,              |
| Fe. 744,398, Fe. 756,778, Fe. 774,507,          |                            | Fe. 688,529, Fe. 812,376, Ger. 493,675,             |                            |
| Fe. 796,002, Fe. 803,253, Fe. 804,381,          |                            | Ger. 564,607, Ger. 564,988, Ger. 706,304            |                            |
| Fe. 820,590, Fe. 830,106, Fe. 845,252,          |                            | Karrick, Lewis Cass-----                            | Fe. 659,729, Fe. 659,730   |
| Fe. 885,780, Fe. 901,944, Fe. 903,177,          |                            | Keck, Rudolf-----                                   | Fe. 1,071,555              |
| Fe. 903,337, Ger. 437,970, Ger. 443,445,        |                            | Keller, Victor Otto-----                            | Ger. 374,504               |
| Ger. 446,678, Ger. 458,074, Ger. 484,003,       |                            | Kemp, A. V.-----                                    | Bel. 412,861, Fe. 647,711  |
| Ger. 487,886, Ger. 494,240, Ger. 496,342,       |                            | Kleisser, Wilhelm-----                              | Ger. 549,213               |
| Ger. 496,343, Ger. 497,894, Ger. 498,225,       |                            | Kling, A. J.-----                                   | Bel. 347,669               |
| Ger. 503,975, Ger. 516,655, Ger. 517,469,       |                            | Klößner, Humboldt-Deutz, A. G.-----                 | Ger. 688,014,              |
| Ger. 518,173, Ger. 520,171, Ger. 535,535,       |                            | Ger. 815,518, Ger. 817,010, Ger. 817,011,           |                            |
| Ger. 535,672, Ger. 541,686, Ger. 545,972,       |                            | Ger. 823,316.                                       |                            |
| Ger. 577,725, Ger. 577,888, Ger. 579,419,       |                            | Klönne, Aug.-----                                   | Fe. 687,244                |
| Ger. 582,495, Ger. 585,531, Ger. 634,877,       |                            | Klötzer, Max-----                                   | Ger. 422,663               |
| Ger. 642,526, Ger. 647,142, Ger. 659,654,       |                            | Knobloch, Dr. Walter-----                           | Ger. 859,191               |
| Ger. 693,432, Ger. 696,026, Ger. 708,729,       |                            | Koehler, Marcel-----                                | Fe. 839,391,               |
| Ger. 808,058, Ger. 818,825, Ger. 882,454,       |                            |   | Fe. 840,014, Fe. 873,624   |
| It. 402,379, It. 468,502.                       |                            | Koettnitz, Dr. Curt.-----                           | Ger. 323,588               |
| Illingworth Carbonization Co., Ltd.-----        | Bel. 410,219               | Kohle, und Etz G.m.b.H.-----                        | Ger. 330,573               |
| Imbert-Gasgeneratoren GmbH-----                 | Ger. 580,664               | Kohlenscheidungs—G.m.b.H.-----                      | Ger. 401,723               |
| Imbert, Georges-----                            | Fe. 615,353                | Kohlenveredlung und Schwelwerke—                    |                            |
| Imperial Chemical Industries, Ltd.-----         | Fe. 639,683                | A.G.-----   | Ger. 562,922               |
| Fe. 649,780, Fe. 920,290, Fe. 922,414,          |                            | Koller, Carlo-----                                  | It. 435,357                |
| Fe. 940,694, Fe. 940,695, Fe. 962,006,          |                            | Koller, Karl-----                                   | Bel. 479,136               |
| Fe. 973,923, Fe. 1,033,848, Fe. 1,035,237,      |                            | Fe. 705,815, Fe. 583,957, Fe. 547,584,              |                            |
| Fe. 1,042,673, Fe. 1,049,635, Fe. 1,065,761,    |                            | Fe. 851,885, Ger. 479,030, Ger. 573,112.            |                            |
| Fe. 1,069,002, Fe. 1,071,137.                   |                            | Koller, Karoly-----                                 | Fe. 957,207                |
| Indugas Industrie und Gasofen-Bau               | Bel. 374,706               | Kopmann, Walter-----                                | Ger. 690,303, Ger. 717,449 |
| G.m.b.H.-----                                   |                            | Koppenberg, Heinrich-----                           | Ger. 727,676               |
| Industrie Minerarie Chemichee Mec-              |                            | Koppers Co., Inc.-----                              | Fe. 978,132,               |
| caniche (Soterna Soc. Generale per              |                            | Fe. 978,133, Fe. 978,134, Fe. 978,135,              |                            |
| le)-----  | It. 402,215                | Fe. 978,136, Fe. 978,137, Fe. 978,138,              |                            |
| Industries of America, Inc.-----                | Ger. 589,728               | Ger. 832,037, Ger. 833,836, It. 448,293,            |                            |
| Industrimetoder (Aktiebotaget)-----             | Fe. 868,735,               | It. 448,680, It. 448,734, It. 449,087, It. 450,243, |                            |
|   | It. 385,919                | It. 450,244, It. 451,588, It. 461,976, It. 461,977  |                            |
| International Combustion Engineering            |                            | Koppers, E. H.-----                                 | Ger. 847,944, Ger. 893,115 |
| Corporation-----                                | Fe. 605,731                | Koppers Heinrich-----                               | Fe. 477,279, Ger. 289,590  |
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| (The)-----                                      | Fe. 487,132                | Koppers, N. V.-----                                 | Bel. 436,705, Fe. 903,002  |
| International Holding de Distillation           |                            | Körting & Ahrens G.m.b.H.-----                      | Ger. 452,401,              |
| et de Cokéfaction à Basse Tempera-              |                            |   | Ger. 452,867               |
| ture et Minière-----                            | Bel. 398,347               | Kranz, Rudolf-----                                  | Ger. 917,684               |
| Inzerillo, Raffaele-----                        | It. 444,963                | Krüger, Friedrich-----                              | Fe. 807,583                |
| Italiana Carburanti Sintetici (Societa)         | It. 452,702                | Kühnl, Franz-----                                   | Fe. 561,134                |
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| Jackson Research Corp.-----                     | Fe. 587,896                | Lacan, Gilbert-----                                 | Fe. 867,325                |
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|   | Ger. 431,137               | Lackmann & Meinecke-----                            | Fe. 471,196                |
| Jamotte, Paul-----                              | Ger. 688,046               | Lacombe, Auguste-Eugene-----                        | Fe. 841,624                |
| Jappelt, Alfred-----                            | Fe. 557,252                | L. & C. Steinmuller-G.m.b.H.-----                   | Bel. 533,843               |
| Jaques, Arthur-----                             | It. 422,460                | Lafond, Georges-----                                | Fe. 941,583                |
| Jarry, Georges-----                             | Fe. 590,443                | Laing, Bryan-----                                   | Fe. 586,160,               |
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| tion de Gas-Industriels (Société).....       | Fe. 473,937                 | Messerknecht, Dr. Carl.....                       | Ger. 497,894,               |
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| "La Lillois" (Société).....                  | Fe. 993,000                 | Metallbank und Metallurgische-Gesell-             |                             |
| Limberg, H. J.....                           | Bel. 375,143                | schaft A. G.....                                  | Fe. 559,755                 |
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| Lutz, Hans Gaserzeuger.....                  | Fe. 956,298                 | Montecatini Società per L'Industria               |                             |
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| Schmidt, Dr. Ernst.....   | Ger. 837,279   | Stewart, John.....                               | Fe. 496,053  |
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| Schmidt'sche Heissdampf GmbH.....   | Fe. 876,374,<br>Fe. 878,379, It. 396,118   | Stoll, Christian.....                            | Ger. 688,014   |
| Schmitt, Dr. Karl.....  | Ger. 865,898   | Stonage, William.....                            | Fe. 973,923  |
| Schneemilch, Alfred.....  | Ger. 906,253   | Stora Kopparbergs Bergslags Aktie-<br>bolag..... | Fe. 894,261  |
| Schneider, Simon.....   | Ger. 713,209, It. 382,308  | Strache, Dr. Hugo.....                           | Fe. 531,989, Fe. 531,990, Ger.<br>290,545, Ger. 348,090, Ger. 353,649, Ger. 382,611  |
| Schnell, Hans.....  | It. 406,448  | Suffern, Ernest Sallsbury.....                   | Fe. 609,652, Fe. 609,657   |
| Schroder, Willi.....  | Ger. 594,705   | Sulzer Freres (S. A.).....                       | Fe. 545,431, Fe. 545,432   |
| Schulte, Johannes.....  | Ger. 316,412   | Svenska Skifferoljeaktiebolaget.....             | Swe. 121,737,<br>Swe. 123,136, Swe. 123,137, Swe. 123,138, Swe.<br>129,838, Swe. 130, 291, Swe. 132,991.   |
| Schulz, Jacques-Gustave.....  | Fe. 566,727, Fe. 594,734,<br>Fe. 595,671, Fe. 636,690, Fe. 638,926   | Synthetic Ammonia & Nitrates, Ltd....            | Fe. 545,432,<br>Fe. 606,334  |
| Schumacher, Ernst.....  | Fe. 615,253, Fe. 616,985,<br>Fe. 716,280, Ger. 479,029, Ger. 499,673   | Szigeth, G.....                                  | Bel. 380,576   |
| Schussl, Franz.....   | It. 450,585  | Szikla, Geza.....                                | It. 386,334  |
| Schwartz-Arnyasy, Ivo.....  | Ger. 469,880   | Szikla, Geza.....                                | Fe. 771,960, Ger. 452,015, Ger. 479,793,<br>Ger. 649,196, Ger. 682,034, Ger. 682,600   |
| Schweder, Walter.....   | Fe. 652,277  | Szilard, Dr. Adalbert.....                       | Ger. 549,249   |
| Schweitzer, Alexander.....  | It. 388,001  | <b>T</b>   |  |
| Schwieb, Wilhelm.....   | Ger. 450,460   | Takahata, Seiichi.....                           | Fe. 557,252  |
| Scientifiques et d'Entreprises Indus-<br>trielles (Société d'Etudes)..... | Bel. 366,857   | Talvio, Allan.....                               | Ger. 659,361   |
| Seidenschnur, Fritz.....  | Ger. 323,588   | Tassara, F.....                                  | Bel. 417,379   |
| Senglet, Charles.....   | Fe. 877,828  | T. A. V. A. G. (Société Anonyme).....            | Fe. 868,760  |
| Senner, Dr. Ernst.....  | Ger. 912,990   | Technique Industrielle (Société de).....         | Fe. 1,038,121,<br>Fe. 1,038,122, Fe. 1,068,267   |
| Sepulchre, Fernand.....   | Fe. 980,327  | Temme, Helmut.....                               | Ger. 901,329   |
| Serruys, Max.....   | Fe. 869,969  | Tempier, Marcel.....                             | Fe. 880,871  |
| Servais, Emmanuel.....  | Ger. 314,720   | Texaco Development Corp.....                     | Bel. 478,320,<br>It. 459,044, Fr. 957,449  |
| Sheldon, Samuel B.....  | Fe. 492,450  | Thuman, Frederic.....                            | Fe. 486,057  |
| Sicard, Felix.....  | Fe. 880,871  | Thyssensche Gas- und Wasserwerke<br>G.m.b.H..... | Bel. 517,196, Fe. 1,073,591  |
| Siegener, Maschinenbau A. G.....  | Ger. 427,038   | Tillmetz, Franz P.....                           | Fe. 615,253, Fe. 616,985   |
| Siemens, Friedrich.....   | Ger. 371,745   | Tinant, J.....                                   | Bel. 451,203   |
| Silica en Ovemburg Mij, N. V.....   | Fe. 656,062,<br>Fe. 689,854, Fe. 698,891   | Totzek, Friedrich.....                           | Ger. 832,037,<br>Ger. 833,836, Ger. 913,810  |
| Simmersbach, Louise (née Sudermann).....                                  | Ger. 340,625   | Traferi, Leone.....                              | It. 385,732  |
| Simon, Leon-Francois.....   | Fe. 878,047  | Traut, Adolf.....                                | Ger. 518,173,<br>Ger. 520,171, Ger. 545,972, Ger. 579,419  |
| Simonet, Louis-Victor.....  | Fe. 490,812  | Trautmann, Joseph.....                           | Fe. 625,648  |
| Singh, Alamjit Dhaliwal.....  | Fe. 999,019  | Travers & Clark, Ltd.....                        | Fe. 563,406  |
| Singy, Ernest.....  | It. 401,262  | Tréfois, Léon.....                               | Fe. 552,821  |
| Sizzo, Neri.....  | It. 408,900  | Trenkmann, Johannes.....                         | Ger. 442,259   |
|   |  | Trent Process Corporation.....                   | Fe. 552,100  |



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| Trinh-Hung-Ngau.....                      | Fe. 856,720                                  | W. C. Holmes & Co. Ltd.....            | Fe. 749,178  |
| Tully Gas Plants, Ltd., Société.....      | Fe. 557,252                                  | Weber, Ludwig.....                     | Fe. 1,041,779,                                     |
| Tully, Sydney James Brittiffe.....        | Ger. 645,090,                                |  | Ger. 861,898                                       |
|   | Ger. 508,815,                                | Wellman Smith Owen Engineering         |  |
| Twittenhoff, Dr. Otto.....                | Ger. 688,143                                 | Corp., Ltd. (The).....                 | Fe. 647,711  |
|   |  | Wells, John.....                       | Fe. 505,428  |
| <b>U</b>                                  |  | Werner, Heinrich.....                  | Ger. 338,370                                       |
| Union Chimique Belge.....                 | Fe. 720,307                                  | Werschen-Weissenfeler Braunkohlen      |  |
| Union Rheinische Braunkohlen Kraft-       |  | A. G.....                              | Ger. 495,372, Ger. 564,870                         |
| stoff A. G.....                           | Bel. 520,591,                                | West, Ernest.....                      | Bel. 394,121,                                      |
|   | Fe. 1,079,446, It. 501,081, It. 504,846      |  | Fe. 568,317, Fe. 699,681, Fe. 841,495, Fe. 861,421 |
| United Engineers & Constructors, Inc..... | Bel. 505,407,                                | West, Frederick Joseph.....            | Bel. 394,121,                                      |
|   | Bel. 509,042, Fe. 1,048,026, Fe. 1,053,937,  |  | Fe. 568,317, Fe. 699,681, Fe. 841,495, Fe. 861,421 |
|   | Fe. 1,054,861, It. 473,861, It. 487,351.     | West, John.....                        | Fe. 480,249  |
| Usines a gaz du Nord et de L'Estab-       |  | West, John Henry.....                  | Fe. 557,252  |
| lissement (Société Anonyme des).....      | Fe. 766,956                                  | West's Gas Improvement Co., Ltd.....   | Bel. 394,121,                                      |
| Usunes Lambot, Société Anonyme des..      | Fe. 595,513                                  |  | Fe. 568,317, Fe. 699,681, Fe. 841,495, Fe.         |
| Universelle de Combustion Léonomi-        |  |  | 861,421 Fe. 876,358, Fe. 922,383, Fe. 974,255,     |
| que (Société).....                        | Fe. 984,078                                  |  | It. 420,900, It. 446,937, It. 448,859.             |
|   |  | White, Samuel Harry.....               | Fe. 1,067,394                                      |
| <b>V</b>                                  |  | Whitfield, Charles.....                | Fe. 698,590  |
| Valorisation Industrielle des Com-        |  | Whitfield Gas Producer Patents Ltd...  | Fe. 755,766  |
| bustibles (Société d'Etudes et de)....    | Bel. 398,919                                 | Whitwell, George Edward.....           | Fe. 582,823  |
| Van Gulck, Leopold.....                   | Fe. 652,849                                  | Wiberg, Frans Martin.....              | Ger. 503,164                                       |
| Van Hemelyrck, Julien.....                | Ger. 563,846                                 | Wibratte, Eugene.....                  | Bel. 394,121,                                      |
| Van Loon, Willem.....                     | Ger. 908,516                                 | Wiedemann, Hans.....                   | Ger. 459,052                                       |
| Van Den Kerchove et Carels, S. A.....     | Bel. 439,398                                 | Willemse, Nicolaas Josephus Martinus.. | Fe. 523,714  |
| Verein für Chemische und Metallurgi-      |  | Williams, John Norman.....             | Fe. 755,766  |
| sche Produktion.....                      | Fe. 681,050, Fe. 681,775                     | Winkelmann, Otto.....                  | Ger. 890,696                                       |
| Vereinigte Werkstätten Wittenau           |  | Winkler, August.....                   | Fe. 593,209  |
| G.m.b.H.....                              | Ger. 821,096,                                | Winkler, Dr. Fritz.....                | Ger. 443,445,                                      |
|   | Ger. 867,727, Ger. 871,488                   |  | Ger. 484,003, Ger. 494,240, Ger. 496,342,          |
| Vergasungs-Industrie A. G.....            | Fe. 751,323,                                 |  | Ger. 496,343, Ger. 496,346, Ger. 497,894,          |
|   | Fe. 819,591, Fe. 856,731, Ger. 709,634, Ger. |  | Ger. 498,225, Ger. 502,975, Ger. 516,655,          |
|   | 710,724, It. 385,294, It. 389,996.           |  | Ger. 535,535, Ger. 535,672, Ger. 541,686,          |
| Verity, Otho Roberto.....                 | Fe. 533,908, Fe. 535,000,                    |  | Ger. 577,888, Ger. 585,531, Ger. 642,526,          |
|   | Ger. 364,348                                 |  | Ger. 647,142, Ger. 708,729, Ger. 808,058,          |
| Vertriebsgesellschaft für Doppelgas-      |  |  | Ger. 882,454, Ger. 899,540, Ger. 907,921,          |
| generatoren G.m.b.H.....                  | Ger. 484,684                                 |  | Ger. 911,886.                                      |
| Veuve Descours & Fils, Société.....       | Fe. 553,894                                  | Wintershall, A.G.....                  | Fe. 797,431,                                       |
| Videau, Roger.....                        | Fe. 893,189                                  |  | Fe. 800,330, Ger. 686,761, Ger. 693,370,           |
| Vigreux, Gaston-Henri-Emmanuel.....       | Fe. 567,975                                  |  | Ger. 699,511, Ger. 699,512, Ger. 705,880,          |
| Voelker, Joseph G.....                    | It. 490,690                                  |  | Ger. 706,303, Ger. 714,495, Ger. 718,796.          |
| Vogogas, S. A.....                        | Bel. 528,655, Ger. 816,284                   | Wittenhaus, Hans.....                  | Ger. 660,089                                       |
| Volk, Franz.....                          | Fe. 801,309, Ger. 709,634                    | Wolinski, Karl.....                    | Ger. 454,873                                       |
| von Dadelsen, Rudolf.....                 | Ger. 479,431                                 | Woodall Duckham (1920), Ltd.....       | Bel. 431,706,                                      |
| von der Forst, Dr. Peter.....             | Ger. 368,962                                 |  | Bel. 431,707                                       |
| von Galocsy, Zsigmond.....                | Fe. 705,815, Ger. 573,112                    | Woodall, Duckham & Jones (1920),       |  |
| von Jaszovszky, Janos.....                | Fe. 625,079                                  | Ltd.....                               | Fe. 534,601, Fe. 534,634, Fe. 847,593              |
| von Neubrug, Freiherr Georg Thumb...      | Ger. 598,894                                 |  |  |
| von Neudeck Otto.....                     | Ger. 920,560                                 |  |  |
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| <b>W</b>                                  |  | Yeo, Oliver Evan.....                  | Fe. 508,815, Fe. 645,090                           |
| Wagner, Johann.....                       | It. 406,448                                  |  |  |
| Wagner, Othmar.....                       | It. 506,374                                  | <b>Z</b>                               |  |
| Walther & Cie. A. G.....                  | Ger. 934,662                                 | Zahn & Co. G.m.b.H.....                | Ger. 666,306, Ger. 512,654                         |
| Walther Feld & Co.....                    | It. 488,602                                  | Zechetmayr, Otto.....                  | Ger. 873,434                                       |
| Warnant, Edmond.....                      | Fe. 573,555                                  | Zeidler, Rudolf.....                   | Ger. 428,143                                       |
| Wasserzieher, Paul.....                   | Ger. 664,190                                 | Zeuch, Alfred.....                     | Fe. 901,590  |

