REGULATION OF EXPLOSIVES IN THE UNITED STATES

WITH ESPECIAL REFERENCE TO THE ADMINISTRATION OF THE

EXPLOSIVES ACT OF OCTOBER 6, 1917

BY THE

BUREAU OF MINES

BY

CHARLES E. MUNROE

WASHINGTON
GOVERNMENT PRINTING OFFICE
1921
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First edition, February, 1921.
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REGULATION OF EXPLOSIVES IN THE UNITED STATES, WITH
ESPECIAL REFERENCE TO THE ADMINISTRATION OF THE
EXPLOSIVES ACT OF OCTOBER 6, 1917, BY THE BUREAU OF
MINES.

By Charles E. Munroe.

ORIGIN OF FEDERAL EXPLOSIVES ACT, OCTOBER 6, 1917.

At the outset of the war the uncontrolled production and possession
of explosives obviously became a serious menace to the safety of
persons and property and the successful conduct of military oper-
ations. Even in the years immediately preceding the entrance of
the United States into the Great War explosives were employed in
attempts to wreck munitions plants as at Eddystone, Pa., or to inter-
rupt transportation and conveyance by demolition of munition-laden
cars as at Black Tom Island, N. Y., or by attacks on ships, bridges,
and viaducts. Outrages with explosives, such as that which Holt
inflicted on the Senate reception room, United States Capitol, were
not infrequent, and often caused serious loss of life and injury to
persons as well as destruction of property.

The regular manufacturers of explosives were keenly alive to this
menace and early took such steps as lay within their power to meet
it as is shown by the following letter:

CIRCULAR NO. 356-A.

NEW YORK, March 8, 1917.

To all division managers, salesmen, magazine keepers:

Dear Sirs: Please refer to our circular No. 30, dated July 15, 1915, which reads
as follows:

"From and after the receipt of this circular you are requested to use your utmost
care in the sale and delivery of high explosives.

"You are required to satisfy yourself, either by actual knowledge or by information
acquired from reliable sources, that the party buying from you has legitimate use of
explosives: And in no case will you deliver or sell such goods to parties unknown or
unidentified."

I call your attention because this is a time when special attention should be paid to
the sale and delivery of high explosives.

Yours, very truly,

(Signed) A. C. Blum,
General Sales Agent.
Some of the States had no laws of any kind relative to explosives, and the laws were not alike in the States that had regulation. Therefore, to secure that uniform supervision and control which was essential, the law regulating explosives would have to be nation wide and nationally administered. The assumption of jurisdiction by the Federal Government was an invasion of the police powers of the States, but was justified by military necessity, and the right for such action at that time existed in the war powers of the Congress.

The necessity for Federal regulation was recognized by governors of the New England States who impressed it upon the War Department as an immediate and imperative need, and Brig. Gen. Joseph E. Kuhn, then Chief, War College Division, General Staff Corps, United States Army, was assigned to determine the best medium through which the desired action could be secured. Among the then existing divisions of the Government, the Bureau of Mines of the Department of the Interior, which was created in 1910, was charged with a measure of supervision over explosives used in mines where normally nearly 80 per cent of all explosives manufactured in time of peace was consumed. As a consequence the Bureau of Mines had a well-organized explosives division of experienced men who besides having had active contact with explosives as used in mine and field and at the testing station, made a study of the misuse of explosives and, by orders of the director, had visited when feasible, the scene of all accidents and outrages from explosives.

In addressing the House of Representatives Committee of Mines and Mining on this subject at a hearing on the bill, Gen. Kuhn, after referring to "one governor who submitted to the War Department, in writing, his fears and apprehensions over this question and the necessity for some sort of Federal supervision," said: 1

We concluded there was a good deal in what he said, and the matter was brought to a head in that way, and the question arose as to what department or agency was best fitted for taking charge of this material. Naturally, we thought both of the War Department and of the Bureau of Mines, both of which have a great deal to do with explosives, but the Bureau of Mines seemed to us the more appropriate department for two reasons; first, because they were making a very intimate study of all classes of explosives used in mining and had laboratories and fairly well distributed agencies throughout the country; and, secondly, and primarily, that the War Department in these days of war is so overwhelmed with responsibility that the assumption of any additional burden is very much to be avoided if possible. In other words, in time of war the principle to be followed is not to load up the War Department with any additional work that can be taken care of by other departments or bureaus of the Government in the interest of saving them additional exertion and labor.

As a result Dr. Van H. Manning, then Director of the Bureau of Mines, was requested to bring this matter to the attention of the

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1 Regulation of the Use of Explosives. Hearings before the Committee on Mines and Mining of the House of Representatives. 1917. p. 8.
Congress and to assemble and present information essential to the proper consideration of the legislation sought. As the desired law would necessarily restrict the manufacturers, conveyers, dealers and consumers of explosives, Director Manning deemed it wise to secure their cooperation at the outset, especially as their experiences in the explosives industry would enable them to advise the form in which to draft an operative law and to furnish information by which such a law could be promptly carried into effect. He, therefore, at once commissioned the author of this paper to interview the more readily accessible representatives. Within one week of the time the project was entrusted to Director Manning a conference was held in Washington by representatives of those divisions of the Army and Navy most concerned with explosives, the more important manufacturers and consumers, the bureau of explosives of the American Railway Association, of several States and municipalities, and the Bureau of Mines, to consider the form for such a law and the means by which it might be enforced, and to determine the duties to be performed by the various parties interested.

A competent force from the Bureau of Mines was then assigned to study the laws and ordinances of countries, States, and municipalities in which laws and ordinances regulating explosives had been enacted, and especially to ascertain how these laws had been modified by the necessities of the existing state of war, and, also, wherein the proposed law might conflict with or overlap the jurisdiction of existing laws. By April 20, 1917, a bill had been drafted and introduced into the House of Representatives as H. R. 3633, and hearings were begun before the Committee on Mines and Mining of the House. At the hearing held April 20, Dr. Manning presented the following statement:  

JUSTIFICATION FOR THE ACT TO CONTROL THE MANUFACTURE, SALE, AND USE OF EXPLOSIVES.

Since the discovery and utilization of gunpowder no war has been conducted without the use of explosives, and just so far as these explosives have been perfected they have been utilized for war purposes. But explosives are equally important for use in times of peace. They are an essential instrument of our modern civilization and their use for utilitarian purposes in time of peace is extending as our knowledge of them improves and increases, and to be most efficiently used in times of peace they must be readily accessible to the users. As a result we find that they are widely distributed in commerce, as other general merchandise is, and, being thereby readily accessible for use, they may be secured by those who intend to misuse them or to abuse the community by their use of them. It is this problem that we now must meet. It is this problem which has been brought out by the War Department, for since explosives are generally accessible for peaceful uses they can be secured by the enemies of our country for the purposes of demolition of our bridges, our ships, our aqueducts, our electric-light plants, and our other public utilities.

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2 Regulation of the use of explosives. Hearing before the Committee on Mines and Mining of the House of Representatives. 1917. pp. 35-36.
In view of the present dangers it is essential that the Government secure a complete record of every explosives factory in the United States, as regards its location, the kind of explosives it manufactures, the amount of its output of each explosive in a given time, the amount it could produce on a 24-hour run, the value of its products for military purposes, and the readiness with which its plant could be enlarged. A knowledge of location is of prime importance as looking to the use of the factory; first, as a source of supply of material for the defense of our harbors; second, as looking to the factory as a point to be defended (because of the aid it might supply) in case of foreign invasions or of internal uprisings.

Of all of the divisions of the Federal Government, the Bureau of Mines is that one which is best equipped and most directly organized to undertake this work, for it has already a well-trained and well-organized explosives division. It has, from its organization, given much attention to the subject of explosives. It, in times of peace, deals officially with a larger percentage of the explosives manufactured than all the other divisions of the Government, and from the nature of things it always will in times of peace.

All other civilized governments exercise a national supervision over the explosives manufactured within their confines and over the trade in explosives, for they have recognized not only the importance for the users of national supervision in order to promote safety in the use of these dangerous substances, but also that explosives are commodities of such concentrated energy that they may readily be misused.

In enacting legislation the effect a proposed form may produce must be ascertained in advance, so far as possible, for otherwise the attempt to correct an evil may seriously hamper essential industries and hurt the best interests of the people. This was especially true of laws regulating explosives. The industry was old and well established and explosives had become an essential of civilization. Explosives are used in mining coal, iron, copper, lead, zinc, and other metalliferous ores; in quarrying for the blasting out of limestone, sandstone, and fluorite with which to flux metalliferous ores when smelting them; in breaking out dimension stone from which to construct buildings, abutments, bridges, piers, sea walls, and docks; in throwing down broken stone for use as road metal and in the manufacture of phosphate rock for use as a fertilizer and of cement and concrete. They are used in engineering operations for driving tunnels, blasting out obstructions in building highways, throwing over earth in making fills, in building dams, in deepening channels, and in removing or demolishing obstacles to navigation. They are used in agriculture for breaking bowlders and blowing up stumps, for excavating in planting orchards, and for digging ditches in draining swampy land.

This incomplete enumeration of the peace-time uses of explosives shows that the quantity consumed is large. A more definite conception is given by the following statistics of production, to which is added statistics for exportation that disclose something of the effect of war on the explosives industry.
STATISTICS.

PRODUCTION OF EXPLOSIVES IN THE UNITED STATES.

For the past seven years the Bureau of Mines has undertaken the compilation of annual reports showing the production of explosives, excluding exports, in the United States.

The following statistics, in Table 1, received from manufacturers, show the importance of the explosives industry:

<table>
<thead>
<tr>
<th>Year</th>
<th>Production of explosives in the United States.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1912</td>
<td>489,493,131</td>
</tr>
<tr>
<td>1913</td>
<td>500,011,845</td>
</tr>
<tr>
<td>1914</td>
<td>450,251,489</td>
</tr>
<tr>
<td>1915</td>
<td>460,900,796</td>
</tr>
<tr>
<td>1916</td>
<td>505,415,052</td>
</tr>
<tr>
<td>1917</td>
<td>582,475,327</td>
</tr>
<tr>
<td>1918</td>
<td>499,224,660</td>
</tr>
</tbody>
</table>

This production was of explosives used for domestic purposes only, and does not include the amounts manufactured for export by the various powder companies nor the munitions of war or explosives manufactured by the Government during the war.

EXPLOSIVES EXPORTED.

The total value of explosives exported from the United States from 1913–1918 was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>United States exportation of explosives.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>$5,525,077</td>
</tr>
<tr>
<td>1914</td>
<td>10,037,587</td>
</tr>
<tr>
<td>1915</td>
<td>188,969,893</td>
</tr>
<tr>
<td>1916</td>
<td>717,144,649</td>
</tr>
<tr>
<td>1917</td>
<td>633,183,574</td>
</tr>
<tr>
<td>1918</td>
<td>248,539,469</td>
</tr>
</tbody>
</table>

In peace time the mining industry used by far the largest amount of explosives manufactured. In 1915, of the total amount manufactured for domestic use, 72 per cent was used in coal and other mining; in 1916, 73.2 per cent, and in 1917, 76.4 per cent.

The United States in normal times has over 31,000 mines and quarries. About 55,000 wholesale and retail dealers handle explosives, and over 18,000 concerns engaged in the construction of railroads, highways, and waterways use explosives. This gives a total of over 100,000 concerns using such comparatively large quantities of

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*Compiled from Monthly summary of foreign commerce of the United States, published by the Bureau of Foreign and Domestic Commerce, Department of Commerce.*
explosives that special magazines for their storage are an absolute necessity. These figures do not include the even greater army of individual consumers, numbering more than five times as many, as shown by the number of licenses issued, who use dynamite for clearing land and for many other purposes.

HISTORY OF THE ACT.

The proposed legislation was subjected to close scrutiny and to active and prolonged debate and two public hearings were held. The results of the first hearing, which was held on April 20 and 21, 1917, before the Committee on Mines and Mining of the House of Representatives, were issued in a pamphlet of sixty pages, and those of the second hearing held June 6, 1917, before the Committee on Mines and Mining of the United States Senate, were issued in a pamphlet of thirty-five pages, and they set forth the views and criticisms of representatives of all classes. The bill, as originally introduced by the Hon. Martin D. Foster, was numbered H. R. 3633, and it was this which was the subject of the first hearing, but this was so changed and confused by amendments that it was laid on the table and Mr. Foster introduced a second bill, numbered H. R. 3932, which he believed represented the views expressed in debate as to the proper means of accomplishing the object sought. This draft was the subject of the second hearing, and after debate and amendment it was passed by the Congress in the form presented below and became law, on the approval of the President, October 6, 1917, some seven months after the attempt to secure such legislation was begun. The act reads as follows:

[Public—No. 68—65th Congress.]

[H. R. 3932.]

An Act To prohibit the manufacture, distribution, storage, use, and possession in time of war of explosives, providing regulations for the safe manufacture, distribution, storage, use, and possession of the same, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That when the United States is at war it shall be unlawful to manufacture, distribute, store, use, or possess powder, explosives, blasting supplies, or ingredients thereof, in such manner as to be detrimental to the public safety, except as in this Act provided.

Sec. 2. That the words "explosive" and "explosives" when used herein shall mean gunpowders, powders used for blasting, all forms of high explosives, blasting materials, fuses, detonators, and other detonating agents, smokeless powders, and any chemical compounds or mechanical mixture that contains any oxidizing and combustible units, or other ingredients, in such proportions, quantities or packing that ignition by fire, by friction, by concussion, by percussion, or by detonation of, or any part of the compound or mixture may cause such a sudden generation of highly heated gases that the resultant gaseous pressures are capable of producing destructive effects on contiguous objects, or of destroying life or limb, but shall not include small arms or shotgun cartridges: Provided, That nothing herein contained shall be construed to prevent the manufacture, under the authority of the Government, of explosives for,
their sale to or their possession by, the military or naval service of the United States of America.

Sec. 3. That the word "ingredients" when used herein shall mean the materials and substances capable by combination of producing one or more of the explosives mentioned in section one hereof.

Sec. 4. That the word "person," when used herein, shall include States, Territories, the District of Columbia, Alaska, and other dependencies of the United States, and municipal subdivisions thereof, individual citizens, firms, associations, societies and corporations of the United States and of other countries at peace with the United States.

Sec. 5. That from and after forty days after the passage and approval of this Act no person shall have in his possession or purchase, accept, receive, sell, give, barter or otherwise dispose of or procure explosives, or ingredients, except as provided in this Act: Provided, That the purchase or possession of said ingredients when purchased or held in small quantities and not used or intended to be used in the manufacture of explosives, are not subject to the provisions of this Act: Provided further, That the superintendent, foreman, or other duly authorized employee at a mine, quarry, or other work, may when licensed so to do, sell or issue, to any workman under him, such an amount of explosives, or ingredients, as may be required by that workman in the performance of his duties, and the workman may purchase or accept the explosives, or ingredients, so sold or issued, but the person so selling or issuing same shall see that any unused explosives, or ingredients, are returned, and that no explosives, or ingredients, are taken by the workman to any point not necessary to the carrying on of his duties.

Sec. 6. That nothing contained herein shall apply to explosives or ingredients while being transported upon vessels or railroad cars in conformity with statutory law or Interstate Commerce Commission rules.

Sec. 7. That from and after forty days after the passage of this Act no person shall manufacture explosives unless licensed so to do, as hereinafter provided.

Sec. 8. That any licensee or applicant for license hereunder shall furnish such information regarding himself and his business, so far as such business relates to or is connected with explosives or ingredients at such time and in such manner as the Director of the Bureau of Mines, or his authorized representative, may request, excepting that those who have been or are at the time of the passage of this Act regularly engaged in the manufacture of explosives shall not be compelled to disclose secret processes, costs, or other data unrelated to the distribution of explosives.

Sec. 9. That from and after forty days after the passage and approval of this Act every person authorized to sell, issue, or dispose of explosives shall keep a complete itemized and accurate record, showing each person to whom explosives are sold, given, bartered, or to whom or how otherwise disposed of, and the quantity and kind of explosives, and the date of each such sale, gift, barter, or other disposition, and this record shall be sworn to and furnished to the Director of the Bureau of Mines, or his authorized representatives, whenever requested.

Sec. 10. That the Director of the Bureau of Mines is hereby authorized to issue licenses as follows:

(a) Manufacturer's license, authorizing the manufacture, possession, and sale of explosives and ingredients.
(b) Vendor's license, authorizing the purchase, possession, and sale of explosives or ingredients.
(c) Purchaser's license, authorizing the purchase and possession of explosives and ingredients.
(d) Foreman's license, authorizing the purchase and possession of explosives and ingredients, and the sale and issuance of explosives and ingredients to workmen under the proviso to section five above.
(e) Exporter's license, authorizing the licensee to export explosives, but no such license shall authorize exportation in violation of any proclamation of the President issued under any Act of Congress.

(f) Importer's license, authorizing the licensee to import explosives.

(g) Analyst's, educator's, inventor's, and investigator's licenses authorizing the purchase, manufacture, possession, testing, and disposal of explosives and ingredients.

Sec. 11. That the Director of the Bureau of Mines shall issue licenses, upon application duly made, but only to citizens of the United States of America, and to the subjects or citizens of nations that are at peace with them, and to corporations, firms, and associations thereof, and he may, in his discretion, refuse to issue a license, when he has reason to believe, from facts of which he has knowledge or reliable information, that the applicant is disloyal or hostile to the United States of America, or that, if the applicant is a firm, association, society, or corporation, its controlling stockholders or members are disloyal or hostile to the United States of America. The director may, when he has reason to believe on like grounds that any licensee is so disloyal or hostile, revoke any license issued to him. Any applicant to whom a license is refused or any licensee whose license is revoked by the said director, may at any time within thirty days after notification of the rejection of his application or revocation of his license, apply for such license or the cancellation of such revocation to the Council of National Defense, which shall make its order upon the director either to grant or to withhold the license.

Sec. 12. That any person desiring to manufacture, sell, export, import, store, or purchase explosives or ingredients, or to keep explosives or ingredients in his possession, shall make application for a license, which application shall state, under oath, the name of the applicant; the place of birth; whether native born or naturalized citizen of the United States of America; if a naturalized citizen, the date and place of naturalization; business in which engaged; the amount and kind of explosives or ingredients which during the past six months have been purchased, disposed of, or used by him; the amount and kind of explosives or ingredients now on hand; whether sales, if any, have been made to jobbers, wholesalers, retailers, or consumers; the kind of license to be issued, and the kind and amount of explosives or ingredients to be authorized by the license; and such further information as the Director of the Bureau of Mines may, by rule, from time to time require.

Applications for vendor's, purchaser's, or foreman's licenses shall be made to such officers of the State, Territory, or dependency having jurisdiction in the district within which the explosives or ingredients are to be sold or used, and having the power to administer oaths as may be designated by the Director of the Bureau of Mines, who shall issue the same in the name of such director. Such officers shall be entitled to receive from the applicant a fee of 25 cents for each license issued. They shall keep an accurate record of all licenses issued in manner and form to be prescribed by the Director of the Bureau of Mines, to whom they shall make reports from time to time as may be by rule issued by the director required. The necessary blanks and blank records shall be furnished to such officers by the said director. Licensing officers shall be subject to removal for cause by the Director of the Bureau of Mines, and all licenses issued by them shall be subject to revocation by the director as provided in section eleven.

Sec. 13. That the President, by and with the advice and consent of the Senate may appoint in each State and in Alaska an explosives inspector, whose duty it shall be, under the direction of the Director of the Bureau of Mines, to see that this Act is faithfully executed and observed. Each such inspector shall receive a salary of $2,400 per annum. He may at any time be detailed for service by said director in the District of Columbia or in any State, Territory, or dependency of the United States. All additional employees required in carrying out the provisions of this Act shall be appointed by the director of the Bureau of Mines, subject to the approval of the Secretary of the Interior.
Sec. 14. That it shall be unlawful for any person to represent himself as having a license issued under this Act, when he has not such a license, or as having a license different in form or in conditions from the one which he in fact has, or without proper authority make, cause to be made, issue or exhibit anything purporting or pretending to be such license, or intended to mislead any person into believing it is such a license, or to refuse to exhibit his license to any peace officer, Federal or State, or representative of the Bureau of Mines.

Sec. 15. That no inspector or other employee of the Bureau of Mines shall divulge any information obtained in the course of his duties under this Act regarding the business of any licensee, or applicant for license, without authority from the applicant for license or from the Director of the Bureau of Mines.

Sec. 16. That every person authorized under this Act to manufacture or store explosives or ingredients shall clearly mark and define the premises on which his plant or magazine may be and shall conspicuously display thereon the words “Explosives—Keep Off.”

Sec. 17. That no person, without the consent of the owner or his authorized agents, except peace officers, the Director of the Bureau of Mines and persons designated by him in writing, shall be in or upon any plant or premises on which explosives are manufactured or stored, or be in or upon any magazine premises on which explosives are stored; nor shall any person discharge any firearms or throw or place any explosives or inflammable bombs at, on, or against any such plant or magazine premises, or cause the same to be done.

Sec. 18. That the Director of the Bureau of Mines is hereby authorized to make rules and regulations for carrying into effect this Act, subject to the approval of the Secretary of the Interior.

Sec. 19. That any person violating any of the provisions of this Act, or any rules or regulations made thereunder, shall be guilty of a misdemeanor and shall be punished by a fine of not more than $5,000 or by imprisonment not more than one year, or by both such fine and imprisonment.

Sec. 20. That the Director of the Bureau of Mines is hereby authorized to investigate all explosions and fires which may occur in mines, quarries, factories, warehouses, magazines, houses, cars, boats, conveyances, and all places in which explosives or the ingredients thereof are manufactured, transported, stored, or used, and shall, in his discretion, report his findings, in such manner as he may deem fit, to the proper Federal or State authorities, to the end that if such explosion has been brought about by a willful act the person or persons causing such act may be proceeded against and brought to justice; or, if said explosion has been brought about by accidental means, that precautions may be taken to prevent similar accidents from occurring. In the prosecution of such investigations the employees of the Bureau of Mines are hereby granted the authority to enter the premises where such explosion or fire has occurred, to examine plans, books, and papers, to administer oaths to, and to examine all witnesses and persons concerned, without let or hindrance on the part of the owner, lessee, operator, or agent thereof.

Sec. 21. That the Director of the Bureau of Mines, with the approval of the President, is hereby authorized to utilize such agents, agencies, and all officers of the United States and of the several States, Territories, dependencies, and municipalities thereof, and the District of Columbia, in the execution of this Act, and all agents, agencies, and all officers of the United States and of the several States and Territories, dependencies, and municipalities thereof, and the District of Columbia, shall hereby have full authority for all acts done by them in the execution of this Act when acting by the direction of the Bureau of Mines.

Sec. 22. That for the enforcement of the provisions of this Act, including personal services in the District of Columbia and elsewhere, and including supplies, equipment, expenses of traveling and subsistence, and for the purchase and hire of animal-drawn or motor-propelled passenger-carrying vehicles, and upkeep of same, and for every
other expense incident to the enforcement of the provisions of this Act, there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $300,000, or so much thereof as may be necessary: Provided, That not to exceed $10,000 shall be expended in the purchase of motor-propelled passenger-carrying vehicles.

Approved, October 6, 1917.

With the approval of the act, the following proclamation was issued:

[Manufacture, etc., of explosives in time of war unlawful.]

A PROCLAMATION.

By the President of the United States of America.

Whereas, under and by virtue of an act of Congress entitled "An act to prohibit the manufacture, distribution, storage, use and possession in time of war of explosives, providing regulations for the safe manufacture, distribution, storage, use and possession of the same, and for other purposes," approved by the President on the 6th day of October, 1917, it is provided among other things that from and after forty days after the passage and approval of said act no person shall manufacture, distribute, store, use, or possess explosives or ingredients thereof, not including explosives for the military or naval service of the United States of America under the authority of the Government or ingredients in small quantities not used or intended to be used in the manufacture of explosives, and not including small arms or shotgun cartridges, unless such person shall obtain a license issued in the name of the Director of the Bureau of Mines, except that any workman may purchase or accept explosives or ingredients thereof under prescribed conditions from a licensed superintendent or foreman.

And whereas, it is further provided in said act as follows:

"That the Director of the Bureau of Mines, with the approval of the President, is hereby authorized to utilize such agents, agencies, and all officers of the United States and of the several States, Territories, dependencies, and municipalities thereof, and the District of Columbia, in the execution of this act, and all agents, agencies, and all officers of the United States and of the several States and Territories, dependencies, and municipalities thereof, and the District of Columbia, shall hereby have full authority for all acts done by them in the execution of this act when acting by the direction of the Bureau of Mines."

Now, therefore, I, Woodrow Wilson, President of the United States of America, by this proclamation do announce the following:

That from and after the 15th day of November, 1917, and during the present war with Germany, it will be unlawful to manufacture, distribute, store, use, or possess explosives or ingredients thereof, except as provided in said act.

That the Director of the Bureau of Mines is hereby authorized to utilize, where necessary for the proper administration of said act, the services of all officers of the United States and of the several States, Territories, dependencies, and municipalities thereof, and of the District of Columbia, and such other agents and agencies as he may designate, who shall have full authority for all acts done by them in the execution of the said act when acting under his direction.

In witness whereof, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done in the District of Columbia, this twenty-sixth day of October, in the year of our Lord one thousand nine hundred and seventeen, and of the independence of the United States of America, the one hundred and forty-second.

WOODROW WILSON.

By the President,

ROBERT LANSING,

Secretary of State.

[No. 1404.]
The President's proclamation emphasizes the fact that from and after 40 days after the 6th day of October, 1917, "no person shall manufacture, distribute, store, use or possess explosives or ingredients thereof," giving due notice whereby all persons could qualify under the law by securing licenses, by ridding themselves of any of the forbidden articles in their possession and by refraining from committing any of the forbidden acts. This interval was also needed by the Bureau of Mines in making proper preparations for the enforcement of the law.

In order that the enactment of this law might be given the widest publicity a copy of the President's proclamation was sent to each post office with a request that it be posted in a conspicuous place. Copies were also forwarded to the governor and secretary of state of each State, county clerks, and licensing officers, United States attorneys, chiefs of police and fire departments; fire and safety commissions; manufacturers, importers and exporters of explosives; contractors known to have used explosives; railways, registered chemists and analysts; educational institutions; operators of metal mines and quarries; clay, brick and tile manufacturers; oil and gas operators; operators of coal mines, large and small; and blast furnaces; public road and work commissions; operators of munition plants; engineers and field men of the Bureau of Mines; and many others.

ADMINISTRATION OF THE ACT.

The Director of the Bureau of Mines, having been authorized, under section 18 of the act to make rules and regulations for carrying its provisions into effect, subject to the approval of the Secretary of the Interior, immediately organized the "Explosives Regulations Division" in the bureau and appointed committees to draft regulations and to advise what substances should be styled "ingredients" and be subject to license. The committee to draft the regulations was composed of Capt. E. B. Jones, representing the Institute of Makers of Explosives; Dr. Charles E. Munroe, consulting explosives chemist, Bureau of Mines; Col. W. S. Topping, acting chief inspector, Bureau of Explosives. The committee to determine the ingredients to be subject to license was composed of Maj. J. T. Crabbs, Ordnance Corps, United States Army; Dr. Charles E. Munroe, consulting explosives chemist, Bureau of Mines; Dr. Frank W. DeWolf, assistant director, Bureau of Mines; Mr. F. S. Peabody was appointed to the newly created office of assistant to the director in charge of explosives.

The selection of the ingredients which should be subject to license was difficult, for if the letter of the law had been absolutely followed some 1,200 to 1,500 substances must have been listed from such well known and commonly used substances as cotton, starch, and
sulphur to substances known only to the expert chemist and rarely used even by him. The reading of the records of hearings on the bill and the debates in both Houses of Congress showed that the intent of the law as to ingredients was to prevent improper manufacture of explosives for criminal use and not to embarrass upright and loyal persons by unnecessary restrictions. Moreover, the greater the number of substances subject to license, the greater would be the difficulty in the enforcement of the law. The manufacture of an explosive requires more than one component, in general, a combustible and an oxidizing component, and clearly, if one was controlled the other might be free. Hence, as a rule, only oxidizing substances were listed as "ingredients" subject to license and at the outset only those more common and easily obtainable. The committee was guided in its decisions by a careful study of the code of ordinances of the city of New York as it related to explosives and combustibles and of the codes of other municipalities, and by the advice and suggestions received from many chemists to whom the problem was referred, among whom Dr. William Jay Schieffelin, president of the National Druggists' Association, and Dr. S. P. Saddler, deserve especial mention. A list of "ingredients" containing but 45 items was finally adopted as subject to license, and in order that the proper use of these in pharmacy and medicine might not be impeded quantities of less than one ounce of these were exempt from license.

Director Manning called a conference at the bureau on October 16, 1917, of some 80 persons representing the manufacturers of explosives; operators of anthracite and bituminous coal mines; iron, copper, lead, and zinc mines, and of quarries; union and nonunion miners; officers of the several divisions of the Army and Navy; officials of States and municipalities and of all the divisions of our Federal Government in any degree concerned with the subject. The drafts of regulations prepared by the committees of the bureau named above were laid before this conference, and also a draft prepared at the director's request, by a committee from the Institute of Makers of Explosives. The discussion of these drafts and of issues raised relative to the administration of the law was full and to the point, and much valuable and constructive criticism and sound advice was subsequently submitted in writing by persons present at this conference. As a result of this the regulations were put into a final form and issued early in 1918 in a pamphlet of 44 pages entitled, "General information and rulings for the enforcement of the law regulating the manufacture, distribution, storage, use, or possession of explosives and their ingredients" (Public No. 68, 65th Cong; H. R. 3932) which began as follows:
FOREWORD.

The operation of this law will doubtless cause inconvenience to persons engaged in legitimate business; it may embarrass worthy citizens in the pursuit of their livelihood; it may necessitate the spending of money by bringing about changes in operating methods; but to all loyal citizens these hardships will be slight and temporary, and if we all cooperate in making it an efficient law disloyalty will suffer the penalty it deserves.

If you manufacture or sell explosives, see to it that they pass from you only to those who have lawful need of them. If you use them, make them produce coal or copper or wheat or corn, and protect them well from theft, in order that they may not be used for destructive purposes.

Our enemies are not all in Europe, and it was a weapon to be turned against those of them who are lurking here on our own soil that this law was created. They wear no uniform and do not fight us in the open; but they are here, plotting in various ways to prevent the products of our mines and factories and our forests and our farms from clothing and feeding and arming our own fighting forces and those of our allies.

To each of us is given the duty of producing his or her share of these necessities, and on each of us falls a portion of the responsibility of counteracting the attempts of those who are working behind our backs to make our efforts ineffectual; and so, to each of us comes the chance of participation in the war. The part we can play may be an inconspicuous one, but it will be no less important because of that, and the things we will be fighting for will be the things our boys are dying for; and when success comes to our country, the end that will have been gained will be worth to the world all that it will have cost.

This pamphlet contained a copy of the explosives-regulation law; the President's proclamation; an announcement that "Any person violating any of these rules and regulations shall be guilty of a misdemeanor and shall be punished by a fine of not more than $5,000, or by imprisonment of not more than one year, or by both such fine and imprisonment"; a statement of the purpose of the law; definitions of "person," "explosives," and "ingredients" as they occurred in the law; list of commodities for which licenses were required; kinds of licenses; general rules on licenses; instructions to licensing agents; rules for licensees covering methods of applying for and obtaining licenses from local licensing agents or from the Bureau of Mines at Washington; use, protection, and lapse of licenses; special rules covering shipment of explosives or ingredients by common carriers; special rules for manufacturers of, vendors of, and industries using explosives and ingredients, and for licenses for various kinds of work; rules for the storage of explosives and ingredients; and instructions to United States explosives inspectors. As this pamphlet was published after the organization was effected, it contained also a list of United States explosives inspectors appointed by the President, with their addresses.

ORGANIZATION UNDER THE ACT.

Mr. F. S. Peabody was placed in charge of the division of explosives regulation, the chief branches of which, with their functions and heads, were:

1. Administration and questions of policy, under David D. Bush.

9391°–21—3
2. Investigation of applications for and issuance of manufacturer's, exporter's, and importer's licenses, under L. M. Meade.

3. Examination and appointment of field employees, under C. S. Eby.

4. Investigation and prosecution of violations of the act, under Edgar Priest.

5. Construction and location of magazines and proper storage of explosives and ingredients, under Gustavus N. Snow.

Mr. Peabody remained in charge of this division until May 17, 1918, when he was succeeded by Mr. Clarence Hall. On the resignation of Mr. Hall, August 1, 1919, Mr. F. J. Bailey, assistant to the director, was assigned this division and has remained in charge ever since. Mr. A. C. Yznaga succeeded Mr. Priest in charge of branch 4, and Capt. H. D. Trounce succeeded Mr. Snow in charge of branch 5.

For the enforcement of the act, under section 13, the President, by and with the advice and consent of the Senate, appointed an explosives inspector in each State and in Alaska. The duty of each inspector was "under the direction of the Director of the Bureau of Mines to see that this act is faithfully executed and observed."

Therefore, as the duties of these officials were analogous to those of a sheriff they had to be loyal citizens of forceful character. Considerable knowledge of the properties, uses, and behavior of explosives would have been to their personal advantage, but persons possessing such knowledge were more efficiently employed in endeavoring to meet the enormous demand of our military program.

To prepare these inspectors for the performance of their duties they were assembled in conference at the Bureau of Mines in Washington, December 18, 1917, where they met Secretary Lane and were instructed in detail as to their duties by Director Manning, Chief Peabody, Maj. Crabbs, Mr. A. Bruce Bielaski, of the Department of Justice, Mr. Eby, and others. A second meeting was held in Chicago July 16, 1918, after all had had experience in the working of the act, in order that the inspectors might by conference and exchange of experiences facilitate operations and improve efficiency.

Under each explosives inspector was formed an advisory committee of representatives of those interested in the community most imperiled or of persons most qualified, such as members of the Council of National Defense, the Departments of Justice and Agriculture, the Bureau for the Safe Transportation of Explosives and Combustibles of the American Railway Association, a fire insurance company, a casualty company, and a manufacturer of, large dealer in, or consumer of explosives. The members of the advisory committees were appointed by the Director of the Bureau of Mines, with the approval of the Secretary of the Interior. They were designated assistant inspectors and they acted as deputies to the inspector and rendered him such assistance as lay within their powers.
Grateful acknowledgment is made of the valuable services of these members of the State advisory committees who largely assisted in the successful operation of the act.

LICENSES.

In planning the details of operation it was at first thought that one licensing agent for each county, making a total of 3,032, would suffice to handle the granting of the necessary permits to the dealers and users of explosives throughout the country. However, when the ingredients to be licensed were decided upon, they were found to be so widely distributed and used for so many different purposes that it became necessary to increase the number of licensors, because every druggist, doctor, butcher, and representative of many other professions and trades was forced to take out a license. Hence the number of agents was increased until it reached almost 16,000. The usual method of procedure in making these appointments was to obtain a list of the justices of the peace and notaries public in each State; locate on the map those points where, according to the size of the city or town and the transportation facilities, licensing agents would be needed; choose the man who had the longest term to run, investigate his standing in the Department of Justice files, and if this was found satisfactory mail him his appointment. Preference was given to county clerks when a county seat needed an agent. From November 14, 1918, after the signing of the armistice, when by an order (printed on p. 40) of the Director of the Bureau of Mines, approved by the Secretary of the Interior, the ingredients of explosives were struck from the list requiring a license, the number of licensors was gradually diminished by recalling the appointments beginning with the smaller towns.

On all surface operations, such as railroad and highway construction, where explosives were used, licenses were obtained by foremen and similar responsible parties, who in turn issued the explosives to powder men and others. This necessitated the keeping of a strict account of all explosives used, and not only produced markedly beneficial results, but resulted in a decrease in such accidents as are caused by carelessness in handling and storing explosives.

Through the licensing of users of explosives information and data could be procured which is helpful in safeguarding explosives in the future, not only against theft and possible misuse but also in making recommendation for safe and proper storage in populated districts, so that, if a magazine should explode, the terrific loss of life, limb, and property, which has heretofore resulted may be minimized, or altogether prevented.

Furthermore, by the protection of explosives from the weather, danger and loss to the users from handling deteriorated goods should be greatly reduced.
REGULATION OF EXPLOSIVES.

The form of application issued was as follows:

FORM NO. 6—800

APPLICATION NO. ...... LICENSE NO. ..............

UNITED STATES OF AMERICA.

DEPARTMENT OF THE INTERIOR.

BUREAU OF MINES.

APPLICATION FOR VENDOR'S, PURCHASER'S, ANALYST'S, OR FOREMAN'S EXPLOSIVES LICENSE.

This application should be sworn to before the licensing officer, and a single fee of twenty-five cents will include both the affidavit fee and the license fee.

An application for an analyst's license must be indorsed under oath by two responsible citizens acquainted with applicant and known by the licensing officer.

Mr. ........................................

Post office .................................

County ................................. State .................................

Sir: The undersigned hereby applies for a license under the provisions of the Act of Congress approved October 5, 1917 (Public, No. 68, 65th Congress).

1. (a) IF AN INDIVIDUAL.

Place of birth ........................................ Date of birth .......... Occupation ..............

Are you a citizen of the United States? ..................... If not, give name of country ....

If naturalized, date of naturalization ........ Place of naturalization ..............

Present address of applicant: City .................. County ........ State ...........

(b) IF A FIRM, ASSOCIATION, OR SOCIETY.

Where organized ................................................

Present address of applicant: City .................. County ........ State ...........

(c) IF A CORPORATION.

Place of incorporation .............................. Date of incorporation ......................

Present address of applicant: City .................. County ........ State ..............

2. Kind of license applied for ........................................ (Vendor's, purchaser's, foreman's.)

3. (a) Nature of business in which now engaged ......................

(b) Principal place of business ........................................

(c) Is business controlled by citizens of the United States? .............. If not, give name of country ....

(d) Place and nature of business in foreign countries, if any ..............

4. Amount and kind of explosives or ingredients purchased, disposed of, or used by applicant during the six months next preceding date of this application: (See footnote.)

<table>
<thead>
<tr>
<th>Amount</th>
<th>Kind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased</td>
<td>........................................</td>
</tr>
<tr>
<td>Used by applicant</td>
<td>........................................</td>
</tr>
<tr>
<td>Otherwise disposed of</td>
<td>........................................</td>
</tr>
<tr>
<td>Remaining on hand</td>
<td>........................................</td>
</tr>
</tbody>
</table>

5. Have sales been made to jobbers? ...................... Wholesalers?

Retailers? ...................... Consumers?

6. Explosives and ingredients covered by this application. (See footnote.)

Kind .............. Amount .............. Intended use ..............

7. If a license has been previously issued to you, state kind of license and by whom issued ......................

REMARKS ..............................

........................................

(Signature of applicant.)

Subscribed and sworn to before me this ........ day of .............. A. D. 191......

........................................

(Licensing officer.)

IF ADDITIONAL SPACE IS REQUIRED, ATTACH A SEPARATE SHEET HERETO.
Up to July 1919 the number of licenses of all classes which had been issued was 500,625 of which 950 were manufacturers and exporters licenses. Sixty-two applications for such licenses were refused.

ENFORCEMENT OF PROVISIONS OF THE ACT.

GENERAL INVESTIGATIONS AND CONVICTIONS.

Ninety convictions were obtained under the Federal explosives law in 20 different States, California leading the list with 29. The number by States is as follows:

Convictions obtained by States.

<table>
<thead>
<tr>
<th>State</th>
<th>Convictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>29</td>
</tr>
<tr>
<td>Iowa</td>
<td>14</td>
</tr>
<tr>
<td>Ohio</td>
<td>6</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>6</td>
</tr>
<tr>
<td>Washington</td>
<td>5</td>
</tr>
<tr>
<td>New York</td>
<td>4</td>
</tr>
<tr>
<td>Texas</td>
<td>4</td>
</tr>
<tr>
<td>Alabama</td>
<td>3</td>
</tr>
<tr>
<td>Arizona</td>
<td>3</td>
</tr>
<tr>
<td>Michigan</td>
<td>3</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>3</td>
</tr>
<tr>
<td>Nevada</td>
<td>2</td>
</tr>
</tbody>
</table>

with the States of Georgia, Idaho, Illinois, Kansas, Minnesota, Missouri, New Mexico, and Pennsylvania each recording one conviction.

These figures are somewhat misleading as approximately double the above number of convictions were secured under State laws where the United States explosives inspectors actively assisted the State authorities in presenting and prosecuting violations. In many States, the number of convictions obtained and investigations made was an index of the energy and ability of the inspectors.

Many violations of the Federal explosives law that were brought to the attention of United States attorneys and State authorities were found upon examination to be violations of State laws, and the violators were proceeded against under the State's penal code, which usually provided a heavier penalty. In these cases the Federal explosives inspectors assisted greatly in securing the evidence necessary for conviction. It was not the policy of the Bureau of Mines to press many charges under this act, and in all instances magazine owners and others were previously advised as to the law on the subject and every attempt made to assist them in complying with its provisions.

Prosecution was undertaken only in extreme cases and usually only where the party had previously been carefully warned of the consequences to himself and the danger to the public, and had disregarded it.

Approximately 1,500 cases were investigated, which have been roughly classified as follows:
Investigations of reported violations of the law.

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improper storage</td>
<td>400</td>
</tr>
<tr>
<td>Discovery of explosives</td>
<td>51</td>
</tr>
<tr>
<td>Miscellaneous thefts of explosives</td>
<td>40</td>
</tr>
<tr>
<td>Thefts from magazines</td>
<td>251</td>
</tr>
<tr>
<td>Safe blowing</td>
<td>36</td>
</tr>
<tr>
<td>Dynamiting of fish</td>
<td>18</td>
</tr>
<tr>
<td>Blasting cap accidents</td>
<td>14</td>
</tr>
<tr>
<td>Destruction of dipping vats</td>
<td>120</td>
</tr>
<tr>
<td>Unlawful possession of explosives</td>
<td>72</td>
</tr>
<tr>
<td>Miscellaneous explosions</td>
<td>130</td>
</tr>
<tr>
<td>Army and navy explosions</td>
<td>6</td>
</tr>
<tr>
<td>Mine explosions</td>
<td>8</td>
</tr>
<tr>
<td>Explosions in powder company plants</td>
<td>30</td>
</tr>
<tr>
<td>Bomb outrages</td>
<td>42</td>
</tr>
<tr>
<td>License investigations</td>
<td>202</td>
</tr>
<tr>
<td>Careless handling of explosives</td>
<td>80</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,500</strong></td>
</tr>
</tbody>
</table>

These investigations were those of sufficient importance to have been reported to the Washington office. Many others, among them the less serious violations, were handled by the State inspectors.

**IMPROPER STORAGE.**

A carefully planned campaign of education was followed by the State inspectors. The Washington personnel constantly advised owners and occupiers by correspondence as to the different types of magazine construction that would be approved. Specifications were forwarded to all persons or firms interested in safely storing explosives, or improving the existing storage. No prosecutions for insufficient or unsafe storage were instituted until after many warnings had been issued as to the necessity of the owner's providing proper safeguards for his stock and protection for his employees and the public, and after ample time had been allowed for making the changes recommended. Some of these warnings went unheeded, with the result that a large number of the convictions obtained were on account of improper storage. Fines differing with the gravity of the offense, from $1 to $500 on each count, were levied on most of the convicted persons.

Unfortunately in many localities it was the general impression that the act, being a war measure, was designed only to prevent enemies and their sympathizers from obtaining explosives. With the signing of the armistice there was a marked tendency on the part of grand juries in many localities to return findings of "No bill" or "No indictment" against persons charged with improper storage, even where such storage was clearly proved. This procedure undermined to some extent the good effects that had been secured.

The State inspectors and the personnel engaged in enforcing the act required only a reasonable compliance with safety requirements and
attempted to educate magazine owners and the public generally to
the dangers of improperly housed and handled explosives, rather
than to make exacting demands for improvements under penalty
of the law.

On the whole, however, it was decidedly encouraging to note
that numerous firms and persons, when convinced of the possible
danger to which they were subjecting their employees and the public,
not only complied with the regulations in force, but made such further
alterations, often at heavy expense, as would eliminate every recog-
nized source of danger.

The most flagrant cases of improper and dangerous storage were
investigated. Conditions were uncovered which showed that many
States had been entirely unaware of the dangers that existed. The
apparent indifference or ignorance in many districts is inexplicable.
The most serious and disastrous accidents had occurred, stirred
people to indignation for a short time, and then were forgotten with-
out any adequate steps having been taken to prevent a repetition.

THEFTS FROM MAGAZINES.

Numerous thefts from magazines were reported and doubtless
many thefts occurred that were not detected. Such thefts occurred
in almost every State. Many individual powder magazines were
broken into and explosives stolen. One magazine in Oklahoma was
robbed four times inside of three months, and at each time a quan-
tity of nitroglycerin was stolen.

Large amounts of explosives were often taken, also blasting caps,
fuse, and other explosives equipment. From one magazine in Nevada
1,300 pounds of powder was stolen. Almost coincident with news
of unrest in different localities came reports of powder magazines
being forced and their contents stolen. This happened in Nevada,
Massachusetts, and in other States. The source of explosives used
in outrages and in acts of violence was repeatedly traced to pre-
vious thefts from magazines nearby.

The Bureau of Mines has waged a constant campaign against
careless or irresponsible magazine owners. Specifications and
pamphlets covering types of construction have been sent to prac-
tically every magazine owner in the United States. These specifica-
tions provided for weather, fire, and theft-proof construction of all
magazines for storage of high or low explosives, and in addition they
provided for bullet-proof construction of high-explosive magazines.

Although many of the magazines broken into were provided with
heavy, strong, well-made padlocks, these padlocks proved slight
obstacles to the determined thief able to open or destroy any padlock
in a few minutes with the aid of a small steel hacksaw or of a little
"soup" (nitroglycerin).
REGULATION OF EXPLOSIVES.

ACCIDENTS TO CHILDREN.

Many accidents and deaths of children are attributable to the careless manner in which powder magazines are locked or secured. As representative of these unfortunate events, two cases are cited from a large number investigated. On August 4, 1919, at Philadelphia, Pa., three small boys were blown to bits when they accidentally exploded a quantity of dynamite while playing in an unguarded stone quarry. Parts of the body of one victim, aged 13, were found in a lot a block away. Both legs and an arm of another boy were ripped from his body, and the third lad was mangled beyond recognition. Persons living near the quarry declared the explosive was stored in a small tool house that was locked only by a hasp and a nail.

In May, 1918, sewer contractors engaged in the construction of a submain sewer in Tulsa, Okla., were using explosives for excavating. Part of their work was carried on near a school, and an 8-year-old boy in passing stole two boxes of dynamite detonators from the contractor's tool box, and distributed them amongst his playmates, who attempted to ignite or detonate them in different ways. A 10-year-old boy went into the yard, struck a match against a board, and placed the lighted match in the hollow end of the dynamite cap. "An explosion occurred which tore off the thumb and first finger of his right hand, and a portion of his third finger. A large number of particles of the cap were driven into one of his eyes in such a way that the sight of one eye was totally destroyed and the sight of the other eye was greatly impaired." A verdict of $25,000 damages was awarded to the boy by a jury against the contractors and the city of Tulsa.

DESTRUCTION OF DIPPING VATS.

During the year 1919 a very large number of cattle-dipping vats were destroyed in many of the southeastern States, particularly in Arkansas, Alabama, and Georgia, by the use of explosives, usually dynamite.

On account of the ravages of the tick and other vermin among the cattle of these States the Bureau of Animal Industry, Department of Agriculture, found it necessary to quarantine all stock not dipped. The following account from the Arkansas Democrat shows the extent to which these attacks on dipping vats were carried.

Fort Smith, May 30, 1919.—Since the week commencing April 13 and up to the present, a period of 47 days, a total of 72 cattle-dipping vats has been destroyed by dynamite in Arkansas. The record of destruction is without equal in this State since the inauguration of the law requiring the dipping of cattle to free them of ticks. The number of vats destroyed is compiled from press dispatches, and it is reasonable to assume that the list does not include all of the vats that were destroyed.
It is stated there is more opposition to the dipping law in Arkansas at present than ever before. Although there has been spasmodic opposition to the law ever since it became effective, it has never before covered such a wide stretch of territory and has never been asserted so vigorously as at present. Not content with destroying vats opponents of the law have in several instances destroyed the charge or solution in the vats and have scattered poison over the ground in the vicinity of the dipping grounds.

Farmers and other law-abiding citizens have been forced to resort to the use of firearms in order to protect their dipping vats and to suppress these outrages.

A letter received from United States Explosives Inspector E. T. Reaves, under date of May 29, 1919, says that he feels, as many others in this State feel, that the present Congress should pass some legislation that will make it more difficult to secure explosives, and that this work should be made permanent and given more latitude, with sufficient capable men from the Department of Justice to effectually suppress the lawless operations of those who have been responsible for outrages perpetrated in nearly every section of the State.

Again, on June 27, 1919, Inspector Reaves said:

I am still hopeful that Congress will yet take some action to continue this work for the sake of humanity if nothing more.

Despite the difficulties attending the apprehension and punishment of persons responsible for these acts, numerous arrests were made, and many prosecutions were pending (Nov. 11, 1919). As a result of the licensing of all persons handling and selling explosives, it was possible to trace the source of the explosives with which some of these dipping vats were destroyed.

With the aid of the local and State press, the Bureau of Mines and the Bureau of Animal Industry did much to educate the general public as to the benefits to be derived from dipping their cattle. Dr. R. M. Gow, State veterinarian of Arkansas, says:

Destroying of dipping vats simply delays operations in the particular community for a time and causes inconvenience to the intelligent farmers who are anxious to dip their cattle. It will be noticed that most of the vats destroyed in Arkansas this year have been in those remote sections of two counties that were strongholds of the draft resisters last summer.

Great difficulty was encountered in securing convictions on account of the reluctance of witnesses to testify.

Gov. Brough, of Arkansas, assured the ex-Federal explosives inspector, Mr. E. T. Reaves, Little Rock, Ark., that "he was giving and would continue to give his most active cooperation in suppressing dipping-vat violations, as well as dynamiting the waters in this State."

BOMB OUTRAGES.

Numerous and disastrous bomb outrages throughout the country aroused public opinion to such a degree that much thought and study was given to the problem of strictly enforcing existing law and of
formulating new statutes or regulations to deal effectively with such crimes.

In compliance with the universal demand for such legislation, Secretary Franklin K. Lane, of the Department of the Interior, addressed a letter to Congress recommending that the Federal explosives act of October 6, 1917, be continued in operation in peace as well as war time. In this letter Secretary Lane stated that the legislation was "aimed to meet the need emphasized" by the Senate Judiciary Committee's report on German propaganda and Bolshevism, which declared "the Federal Statutes never have provided adequate security against an unlawful and promiscuous use of high explosives."

All well-informed persons are convinced that in the matter of handling explosives wide-sweeping reforms are needed that will safeguard life and property better than heretofore.

All possible means should be taken to protect the eminent citizens who have been or who might become the target of bomb outrages. Special agents, detectives, and policemen would not hesitate to risk their lives in an endeavor to prevent such attacks, but it is better to prevent the possibility of such attacks. With stringent State regulations, and with explosives closely controlled, there would be comparatively little difficulty in accounting for almost every pound of explosives manufactured or used, and in guaranteeing its safe storage where neither thieves, criminals, nor anarchists could obtain powder or dynamite.

On account of the enormously extended use of explosives during the war, thousands of persons acquired a knowledge of their uses and the ability to handle them with impunity. Previously explosives had been little known generally, and, as a psychological effect, no one cared to handle a stick of dynamite or explosive, unless required to do so by his duties.

The necessarily close relations of labor unrest, Bolshevism, and anarchism, to the regulation of explosives is too obvious to require much comment.

A large number of bomb investigations have been made, but unfortunately few of the perpetrators have been apprehended. Many of these anarchists have perished in their attempts to destroy others, as was the assassin who bombed the house of Attorney General Palmer, who was blown to pieces as he placed his bomb on the doorstep of Mr. Palmer's residence. A similar fate attended four men in Franklin, Mass., who were plotting the destruction of the Ray mill of the American Woolen Co. of that city. These men were carrying dynamite to the mill one night with an evident purpose of destruction, when one, stumbling in the darkness, fell with the explosive.
The resulting detonation blew the four men to pieces, portions of their bodies being found several blocks away.

At the scene of this outrage, as well as at the houses of proposed victims, a copy of the following circular was left.

**PLAIN WORDS.**

The powers that be make no secret of their will to stop, here in America, the worldwide spread of revolution. The powers that must be reckon that they will have to accept the fight they have provoked.

A time has come when the social question's solution can be delayed no longer; class war is on and can not cease but with a complete victory for the international proletariat.

The challenge is an old one, oh "democratic" lords of the autocratic republic. We have been dreaming of freedom, we have talked of liberty, we have aspired to a better world, and you jailed us, you clubbed us, you deported us, you murdered us whenever you could.

Now that the great war, waged to replenish your purses and build a pedestal to your saints, is over, nothing better can you do to protect your stolen millions, and your usurped fame, than to direct all the power of the murderous institutions you created for your exclusive defense against the working multitudes rising to a more human conception of life.

The jails, the dungeons you reared to bury all protesting voices, are now replenished with languishing conscienbious workers, and never satisfied, you increase their number every day.

It is history of yesterday that your gunmen were shooting and murdering unarmed masses by the wholesale; it has been the history of every day in your régime; and now all prospects are even worse.

Do not expect us to sit down and pray and cry. We accept your challenge and mean to stick to our war duties. We know that all you do is for your defense as a class; we know also that the proletariat has the same right to protect itself. Since their press has been suffocated, their mouths muzzled, we mean to speak for them the voice of dynamite through the mouth of guns.

Do not say we are acting cowardly because we keep in hiding, do not say it is abominable; it is war, class war, and you were the first to wage it under cover of the powerful institutions you call order, in the darkness of your laws, behind the guns of your boneheaded slave.

No liberty do you accept but yours; the working people also have a right to freedom, and their rights, our own rights, we have set ourselves to protect at any price.

We are not many, perhaps more than you dream of, though, but are all determined to fight to the last, till a man remains buried in your bastiles, till a hostage of the working class is left to the tortures of your police system, and will never rest till your fall is complete, and the laboring masses have taken possession of all that rightly belongs to them.

There will have to be bloodshed; we will not dodge; there will have to be murder; we will kill, because it is necessary; there will have to be destruction; we will destroy to rid the world of your tyrannical institutions.

We are ready to do anything and everything to suppress the capitalist class; just as you are doing anything and everything to suppress the proletarian revolution.

Our mutual position is pretty clear. What has been done by us so far is only a warning that there are friends of popular liberties still living. Only now we are getting into the fight; and you will have a chance to see what liberty-loving people can do.
REGULATION OF EXPLOSIVES.

Do not seek to believe that we are the Germans’ or the devil’s paid agents; you know well we are class-conscious men with strong determination and no vulgar liability. And never hope that your cops and your hounds will ever succeed in ridding the country of the anarchistic germ that pulses in our veins.

We know how we stand with you and know how to take care of ourselves. Besides, you will never get all of us * * * and we multiply nowadays. Just wait and resign to your fate, since privilege and riches have turned your heads.

Long live social revolution; down with tyranny. The Anarchist Fighters.

TO THE WORKING PEOPLE OF AMERICA.

The war is over. Your exploiters have quickly placed the profits in safety. You, the working slaves, will soon find yourselves on the streets, facing a hard winter, looking for work, for it is your only means to supply yourselves with the necessities of life, because you lack the courage to use other methods.

You have tolerated all the moral and physical slaveries during this war. When you dared open your mouths to protest you were quickly railroaded to jail.

What were your profits out of this war? You lost all the little of the liberty you had and you gave your sons, brothers, and fathers to be shot down like dogs and left to rot on the fields of France.

For what?
For the glory of the American flag?
So that your masters may have bigger markets to sell their merchandise and exploit other people like you?

The workers of Russia, Germany, Austria, and other countries have risen and have overthrown their rulers.

Not by ballots but by arming yourselves, as it is your only means. You alone do not budge. Are you afraid to follow their example? Are you afraid to take by force what rightly belongs to you?

Will you be meek and servile? Will you wallow under the iron heel of your masters?

Or will you tear your way by the revolution to a better and happier life? Which will you choose?

These investigations were made by the State inspectors and explosives engineers at headquarters in cooperation with the special agents of the Department of Justice and local and State police. In seeking the source of the explosives required in manufacturing these bombs, the active assistance and records of the 16,000 explosives licensing agents throughout the country were utilized to great advantage. Unfortunately the personnel at the disposal of the Bureau of Mines’ Explosives Regulation at the Washington headquarters was very small, and it was impossible to give to these vitally important investigations the necessary time required.

On May 1, 1919, the most elaborate bomb plot in American history was disclosed in New York. Death devices addressed to 16 leaders in the Nation’s political and business life were discovered in the mails; four others reached their destination. By the prompt action of an intelligent post-office clerk these bombs were discovered and terrible consequences averted. Inspector Egan, of the New York fire department, and engineers of the Bureau of Mines, and the
Bureau of Explosives of the Interstate Commerce Commission opened the bombs and assisted in the investigations of the police.

On June 2 attempts were made on the lives of eight prominent officials. The Department of Justice and other agencies have been devoting a great deal of their time to uncovering the source of these outrages. The sworn secrecy and often the total ignorance of the other plotters involved in these "death sentences" increase the difficulties of discovering the assassins. The numerous alien organizations, meetings, and foreign propaganda make the work increasingly difficult.

The theft of very small quantities of explosives, perhaps three or four pounds of dynamite or other high explosive, yields sufficient material to make charges for several small bombs, which have disastrous effects when detonated. As laborers connected with blasting on highways, railroads, and other construction projects can now easily secure a stick or two of dynamite, it is a comparatively simple matter to procure material for the charges of bombs. During the enforcement of the Federal explosives law, however, as all foremen on construction work and other foremen using explosives were obliged to have a license to use and issue explosives to workmen, as well as to keep careful and strict accounting of them, it was very difficult for evil-disposed persons to obtain dynamite.

EXPLOSIONS AND ACCIDENTS.

A large number of explosions, accidents, and fires, which have occurred in munition and other plants, have been reported to the Bureau of Mines, as follows:

Table 3.—Explosions in munition and powder plants.

<table>
<thead>
<tr>
<th>Date</th>
<th>Company</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 7</td>
<td>G. R. McAbee Powder &amp; Oil Co.</td>
<td>Tumonlton, Pa.</td>
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<tr>
<td>Dec.  5</td>
<td>American Zine Co.</td>
<td>Maseot, Tenn.</td>
</tr>
<tr>
<td>5</td>
<td>Aetna Chemical Co.</td>
<td>Heidelberg, Pa.</td>
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<tr>
<td>5</td>
<td>Bethlehem Steel Co.</td>
<td>New Castle, Del.</td>
</tr>
<tr>
<td>22</td>
<td>Newark Rubber Co.</td>
<td>Newark, N. J.</td>
</tr>
<tr>
<td>1918</td>
<td>Atlas Powder Co.</td>
<td>Patterson, Okla.</td>
</tr>
<tr>
<td>Jan.  10</td>
<td>E. I. du Pont de Nemours &amp; Co.</td>
<td>Kenvil, N. J.</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>Valley Falls, N.Y.</td>
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<tr>
<td>12</td>
<td></td>
<td>Butte, Mont.</td>
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<tr>
<td>Feb.  20</td>
<td></td>
<td>Goss, Ohio.</td>
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<td>21</td>
<td></td>
<td>Weippe, Minn.</td>
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<td>25</td>
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<td>Repann, N. J.</td>
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<td>25</td>
<td></td>
<td>Wayne, N. J.</td>
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<tr>
<td>18</td>
<td>Hercules Powder Co.</td>
<td>Gillespie, N. J.</td>
</tr>
<tr>
<td>26</td>
<td>Jarvis Warehouse.</td>
<td>Jersey City, N. J.</td>
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<tr>
<td>29</td>
<td>International Explosives Co.</td>
<td>Swanton, Vt.</td>
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<td>29</td>
<td>Aetna Explosives Co.</td>
<td>Powder Plant.</td>
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<tr>
<td>Apr.  5</td>
<td>Hercules Powder Co.</td>
<td>Gillespie, N. J.</td>
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<tr>
<td>19</td>
<td>E. I. du Pont de Nemours &amp; Co.</td>
<td>Carneys Point N. J.</td>
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</table>
### Table 3.—Explosions in munition and powder plants—Continued.

<table>
<thead>
<tr>
<th>Date</th>
<th>Company</th>
<th>Place</th>
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<tbody>
<tr>
<td>Apr. 22</td>
<td>Hercules Powder Co.</td>
<td>Carthage, Mo.</td>
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<td></td>
<td>E. I. du Pont de Nemours &amp; Co.</td>
<td>Hercules, Calif.</td>
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<tr>
<td>May 18</td>
<td>Hercules Powder Co.</td>
<td>Deepwater, N. J.</td>
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<td></td>
<td>Bucach, Utah</td>
<td>Kenvil, N. J.</td>
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<td>Youngstown, Ohio</td>
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<td>Marlow, Tenn.</td>
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<td>Jersey, Pa.</td>
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<td>Oakdale, Pa.</td>
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<td>Emporium, Pa.</td>
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<td>Kenvil, N. J.</td>
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<tr>
<td>June 2</td>
<td>Actna Explosives Co.</td>
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<td></td>
<td>Actna Chemical Co.</td>
<td>Ishpeming, Mich.</td>
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<td></td>
<td>Actna Explosives Co.</td>
<td>Ferndale, Pa.</td>
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<td>Gillispie, N. J.</td>
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<td>Mount Union, Pa.</td>
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<td>Syracuse, N. Y.</td>
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<td>Kenvil, N. J.</td>
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<td>San Francisco, Calif</td>
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<td>Kenvil, N. J.</td>
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<td>Paulsboro, N. Y.</td>
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<td>Tunkerton, Pa.</td>
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<td>Sept.</td>
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<td></td>
<td>E. I. du Pont de Nemours &amp; Co.</td>
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<td>Pompton Lakes, N. J.</td>
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<td>Eddystone, Pa.</td>
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<td>Peckville, Pa.</td>
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<td>Oct.</td>
<td>Aetna Explosives Co.</td>
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<td>E. I. du Pont de Nemours &amp; Co.</td>
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<td>Emportium, Pa.</td>
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<td>Heidelberg, Pa.</td>
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<td>Carnegie, Pa.</td>
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<td>Hercules, Calif.</td>
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<td>Pompton Lakes, N. J.</td>
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<td>Wilpen, Minn.</td>
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<td>Port Ewen, N. Y.</td>
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<td></td>
<td>Morgan, N. J.</td>
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<td>Near Duluth, Minn.</td>
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<td>Midland, Mich.</td>
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<td>Mount Union, Pa.</td>
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<tr>
<td>Nov.</td>
<td>Aetna Explosives Co.</td>
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<td></td>
<td>E. I. du Pont de Nemours &amp; Co.</td>
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<td></td>
<td></td>
<td>Eastern Manufacturing Co.</td>
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<td>Mt. Union, Pa.</td>
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<td>Quaker Falls, Pa.</td>
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<td>Mt. Union, Pa.</td>
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As will be seen from the above list, the majority of these disasters occurred in powder and munition plants. The loss of life attending explosions has been heavy, and many persons have been injured. The damage to property alone has been enormous, in some disasters as high as several millions of dollars. The origin or cause of the explosion in many disasters was impossible to determine absolutely, despite the fact that the most experienced of the powder company's engineers and chemists, as well as the experts of the Bureau of Mines and Bureau of Explosives of the American Railway Association, have very carefully investigated the circumstances. In many of the accidents there were no survivors, a fact that added to the difficulty of determining the cause.

In justice to the owners of these plants it should be stated that in the majority of cases no expense or care had been allowed to stand in the way of making all the manifold and complicated operations of the manufacture of explosives as safe as circumstances would permit, and no criticism is made of the companies concerned. Although the numbers appear high, yet in view of the tremendous enlargement of munition plants and the increase in output of explosives consequent to the war, the casualties attending all operations have been remarkably low. On account of the pressure of the work involved in the

<table>
<thead>
<tr>
<th>Date</th>
<th>Company</th>
<th>Place</th>
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<tbody>
<tr>
<td>1918 Dec.</td>
<td>2 Astna Explosives Co</td>
<td>Heidelberg, Pa.</td>
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<tr>
<td></td>
<td>5 E. I. Du Pont de Nemours Co</td>
<td>Pompton Lakes, N. J.</td>
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<tr>
<td></td>
<td>9 Astna Explosives Co</td>
<td>Carney's Point, N. H.</td>
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<td></td>
<td>7 E. I. Du Pont de Nemours Co</td>
<td>Olivers Mills, Pa.</td>
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<tr>
<td></td>
<td>12 Astna Explosives Co</td>
<td>Mount Union, Pa.</td>
</tr>
<tr>
<td></td>
<td>16 do</td>
<td>Brandyswine, Md.</td>
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<tr>
<td></td>
<td>7 do</td>
<td>Mount Union, Pa.</td>
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<tr>
<td></td>
<td>8 do</td>
<td>Do.</td>
</tr>
<tr>
<td></td>
<td>20 Astna Explosives Co</td>
<td>Moosic, Pa.</td>
</tr>
<tr>
<td></td>
<td>22 do</td>
<td>Fayville, Ill.</td>
</tr>
<tr>
<td></td>
<td>27 do</td>
<td>Emporium, Pa.</td>
</tr>
<tr>
<td></td>
<td>30 do</td>
<td>Mount Union, Pa.</td>
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<tr>
<td></td>
<td></td>
<td>Goes, Ohio.</td>
</tr>
<tr>
<td>1919 Jan.</td>
<td>7 Hercules Powder Co</td>
<td>Hercules, Calif.</td>
</tr>
<tr>
<td></td>
<td>9 Astna Explosives Co</td>
<td>Emporium, Pa.</td>
</tr>
<tr>
<td></td>
<td>10 E. I. Du Pont de Nemours Co</td>
<td>Deepwater Point, N. J.</td>
</tr>
<tr>
<td></td>
<td>19 Hercules Powder Co</td>
<td>Kenvil, N. J.</td>
</tr>
<tr>
<td>Feb.</td>
<td>7 do</td>
<td>Do.</td>
</tr>
<tr>
<td></td>
<td>3 Grasselli Powder Co</td>
<td>New Castle, Pa.</td>
</tr>
<tr>
<td></td>
<td>9 Egyptian Powder Co</td>
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<td></td>
<td>19 General Explosives Co</td>
<td>Joplin, Mo.</td>
</tr>
<tr>
<td>Mar.</td>
<td>1 Winchester Repeating Arms Co</td>
<td>New Haven, Conn.</td>
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<td></td>
<td>2 Western Powder Co</td>
<td>Edwards, Ill.</td>
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<tr>
<td></td>
<td>4 E. I. Du Pont de Nemours Co</td>
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<td>5 Grasselli Powder Co</td>
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<td>11 E. I. du Pont de Nemours &amp; Co</td>
<td>Gibbstown, N. J.</td>
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<td></td>
<td>11 Astna Explosives Co</td>
<td>North Birmingham.</td>
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<td></td>
<td>28 Ordnance Department, U. S. A.</td>
<td>Aberdeen Proving Grounds, Md.</td>
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<td></td>
<td></td>
<td>Fayville, Ill.</td>
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<tr>
<td></td>
<td>29 Astna Explosives Co</td>
<td>Connable, Ala.</td>
</tr>
<tr>
<td>Apr.</td>
<td>2 E. I. du Pont de Nemours &amp; Co</td>
<td>Wayne, N. J.</td>
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<tr>
<td></td>
<td>3 do</td>
<td>Turek, Kans.</td>
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</table>
in investigations and in exercising general control of explosives by civilians during the war, it was possible for the Bureau of Mines to investigate only the most important accidents. Among the major disasters resulting from the war activities were those listed below:

On October 14, 1918, a series of explosions occurred at the loading plant of the T. A. Gillespie Loading Co., at Morgan, N. J., resulting in the loss of 11 lives.

At the Pompton Lakes, N. J., plant of the E. I. du Pont de Nemours & Co., a disaster occurred on September 6, 1918, which resulted in the death of four girls.

At the same plant on December 5, 1918, 14 persons were killed and 22 injured in another accident.

In 1918 several very large TNT plants of various powder companies were destroyed by fire or explosions. The TNT plant of the Semet-Solvay Co., at Syracuse, N. Y., was destroyed in this way on July 2, 1918. In this unfortunate catastrophe 52 persons were killed and 25 injured.

At the Kenvil, N. J., TNT plant of the Hercules Powder Co. an accident occurred on August 7, 1918, involving the death of 2 men and injury to 5 others; at the same plant a week later a fire broke out in which 2 persons lost their lives and 11 others were injured.

At Barksdale, Wis., TNT plant of the E. I. du Pont de Nemours & Co. an explosion occurred on August 2, 1918, in which 6 persons were killed. Another one occurred on December 7, 1917, at the Carnegie TNT plant of the Aetna Explosives Co. in which 11 persons were killed.

Details of numerous other explosions might be cited, but space does not permit.

Numerous explosions of a miscellaneous nature have been brought to the attention of the bureau, but many have not been reported. Unfortunately it has been impossible to gather definite statistics covering these; investigation would doubtless prove that many could have been prevented.

One explosion of this nature, in the Laner Building, Pittsburgh, Pa., in the stock rooms of the Film Exchanges, caused the death of 10 persons and the injury of 20 others. The most disastrous of the mine accidents caused by explosives was that in the Baltimore Tunnel of the Delaware & Hudson Coal Co. near Wilkes-Barre, Pa., on June 5, 1919, which killed 93 men and injured 43. Many explosions and accidents in the United States have occurred during Army and Navy operations. The terms of the Federal explosives act exempted these departments from the control of the Bureau of Mines, though several major explosions were investigated.

In all important plants explosions in works engaged in war manu-factures the military and naval authorities have cheerfully cooperated
with the bureau in endeavoring to determine the origin of the accident, and as a result many improvements have been effected that will do much to reduce the hazards in the future.

MISCELLANEOUS CRIMES WITH EXPLOSIVES.

The miscellaneous crimes with explosives embrace a large category. Statisticians have estimated that approximately 70 per cent of the crimes committed in this country have been accomplished with the aid of explosives. Without doubt, the percentage is very high, and stringent regulations providing for a close control of all explosives are urgently demanded.

The dynamiting of fish continues to be practiced, especially in the Southeastern States, in spite of the State fish and game laws prohibiting it. Explosives for such use are often obtained by thefts from magazines.

Among the 1,500 investigations that this office has conducted, numerous cases have been recorded as "unlawful possession of explosives." Arrests on this charge, which legally implies the absence of a license to possess explosives, have led to the discovery that in practically every instance the persons arrested could not give a satisfactory account of their possession or use of explosives. Yeggs, or criminals of the safe-blowing type, have been thus brought to light, as described in the following clipping from an Arkansas newspaper of June 1, 1919:

HARTFORD, June 1.—William R. Ortigo, an Italian miner of Frogtown, near here is probably fatally wounded, another man is painfully shot, and two others are in jail here as a result of a battle about 11.45 o'clock last night with City Marshal Joe Hargis, who was fired upon at close range by the four men, but escaped with only a powder burn. The men refused to divulge their names, but Ortigo was identified by local citizens. Their automobile was filled with high explosives.

The men drove into town in a Hupmobile car about 11.30 o'clock last night and stopped in the business section. Marshal Hargis approached the car, he said, to arrest the men for joy riding. He saw a Colt's revolver hanging inside the automobile and attempted to take it, whereupon one of the passengers began firing. The marshal drew back, firing as he did so, and the four men jumped from the auto. Two of them fell, victims of the official bullets, a third ran down the street, firing as he ran, and the fourth man surrendered. Constable Lee Scrumb came to the assistance of the marshal, and this morning captured the fourth man, who had run away. He was found asleep in the woods. Several revolvers were taken from the men.

Ortigo is shot through the lung and probably will die. Another of the men suffered a shattered bone in his leg from the officer's bullets. A full kit of burglar tools, nitroglycerine, drills, a cake of soap 6 inches square, and dynamite caps and fuses were found inside the auto. This leads officers to believe they have captured a gang of bad men who have been operating in this section. The man who is shot in the leg appears to be an Italian, and the officers believe all are miners. The prisoners probably will be taken to the jail at Fort Smith for safe-keeping.

One of the many crimes committed with the aid of explosives is that of safe blowing. The usual plan of the experienced "yegg" or
safe blower is to extract the dynamite with a solvent in order to obtain the liquid nitroglycerine or "soup" with which to blow the safe. Many crimes of this character have been investigated and the source of the dynamite has been sought.

MAGAZINE CONSTRUCTION.

Approximately 26,000 report blanks relating to magazine inspection have been mailed to owners of powder magazines, and about 8,000 of these reports have been filled out and returned to the Bureau of Mines. In the Eastern States, such as Pennsylvania, New York, and New Jersey, are a very large number of powder magazines, whereas in most of the Middle States, the number is comparatively small. In the West the States of California and Washington use large amounts of explosives. About 18,500 inspections of magazines were made and reports rendered.

Recommendations for safer construction for approximately 7,000 magazines have been made, and as a rule have been cheerfully followed; many reports have been approved and returned to the files of owners.

If unusual circumstances attended the construction or location of magazines much correspondence was necessary to obtain detailed information; in spite of the inconvenience involved owners generally have been very appreciative of suggestions regarding means of making their plants safer for employees and for the public. The larger companies have been particularly responsive; almost without exception they have voluntarily gone to much trouble and expense to remedy potentially unsafe conditions. Some firms have even abandoned costly magazines in consequence of having their attention called to the danger involved in the location of the buildings.

Thousands of reports have been received from persons using smaller quantities of explosives. A few of these have discontinued storage, but most of them have provided themselves with small portable magazines built according to the specifications of the Bureau of Mines.

The users of explosives who handle quantities sufficient to require facilities for proper and safe storage number, according to a conservative estimate, a little more than 100,000. A campaign of education in the proper storage and use of explosives was initiated at the outset. Standards of magazine construction of different types were submitted and specifications written for the storage of all kinds of explosives. The best possible opinion was invited. The engineers of the Bureau of Mines consulted engineers and chemists of the powder companies, and in several conferences proposed plans and specifications were carefully examined, discussed, and adopted.
With a few minor changes, the standard drawings and specifications of the Institute of Makers of Explosives for the construction of powder magazines were adopted by the Bureau of Mines. This institute is composed of the chief manufacturers of explosives in the United States, and their standards of construction are the result of many years of experience in manufacturing, storing, and handling explosives. With so many and such important changes, however, in the component character and the methods of manufacture of explosives, it is probable that some changes will be made from time to time in methods of storage.

**JUSTIFICATION OF THE FEDERAL EXPLOSIVES ACT.**

The United States is practically the only civilized government in the world that fails to exercise permanently a national supervision over the manufacture, storage, and use of explosives. A few of the States have laws that partly govern or control explosives, but many of these laws are not properly enforced.

Explosives are fundamental necessities; they are essential instruments of modern civilization, and their uses in industry as well as in war are so varied and extensive that the safe disposition and use of explosives is a matter of capital importance to every citizen.

For economy and efficiency in use it is imperative that explosives should be readily accessible. As a result they are distributed like other general merchandise, and in the absence of Governmental regulation and supervision may be obtained easily by those who intend to make improper use of them. This is the problem which the Bureau of Mines brings to the attention of the public. As explosives are so generally available, so often used improperly, and are such deadly agents of destruction in the hands of the careless and criminal, is it not wise that the Federal or State Governments should exercise a strict and uniform control over them? Explosives are substances of such concentrated energy that, improperly handled, they constitute a danger to the public that should no longer be tolerated.

This country faces the problems of reconstruction, and it is imperative that the class of people from whom trouble may be expected shall be recognized. As evidence of the state of affairs that obtained when the Federal Explosives Act of October 6, 1917, went into effect, an extract from a report by one of the Federal inspectors is quoted:

We have gathered up the explosives that were lying around in abandoned mines, among the wrecks in railroad cuts and tunnels, in barns, in cellars and houses. The convicts of the State have been using dynamite in their work on the State roads. They could leave it hidden and, when their terms expired, they could recover the dynamite and use it for safeblowing or other criminal purposes. One tramp who has
reformed told me a story that was alarming. He said that he could stop at any water
tank and find out where there was dynamite hidden in a dozen places.

The persons who were leaving explosives lying around carelessly did not seem to
fear the State laws, as there was no State law under which they could be prosecuted.
However, as soon as we made them understand that to be in possession of explosives
that were not adequately protected meant trouble they began to get rid of them.

The result of energetic action in the enforcement of the law on the part of the inspectors and officers of the Explosives Regulation was soon manifested. For example, these facts were noticed by Director Manning: An enemy alien conceived the idea of getting rid of a man he disliked by blowing him up with a bomb. In manufacturing the death-dealing instrument he found it extremely difficult to buy the powder he needed, owing to the restrictions of the war regulation act. In order to get the explosive he went from store to store, purchasing at each a few small-arms cartridges, from which he extracted the powder. Even working under these difficulties he was able to get enough explosives to fill his bomb, though the authorities captured it before he had a chance to use it.

After the armistice, the severity of the explosive regulation law was for some months relaxed, and simultaneously the activities of the anarchists and bomb throwers increased.

Preventive measures can not be too strongly advocated in order to check the increasingly serious Bolshevik-anarchist menace to life and property in the United States by making it difficult, if not impossible, for unauthorized persons to obtain explosives. Unless Federal or uniform State legislation comes to the rescue, an unfortunate situation will undoubtedly develop on account of the ease with which even tons of explosives may be procured by the anarchists when supervision is withdrawn. In urging prompt governmental measures Van. H. Manning, former Director of the Bureau of Mines, has pointed out that greater quantities of explosives are available in the United States than in any other country. Moreover, under peace-time conditions it is easier to obtain explosives in this country than in any other. The production of explosives has been enormous. In the calendar year 1917 alone there was manufactured 582,475,327 pounds, or considerably more than half a billion pounds. In view of the possible destructive effect on property, life, or limb of only 1 pound of dynamite, the possibilities for evil and disaster implied by such figures are tremendous.

In most of the States, as their laws now stand, a criminal can obtain any quantity of death-dealing explosives for any diabolical aim—with no questions asked him as to his purpose.

The following editorial from the Washington "Post" of June 12, 1919, sums up many of the arguments for comprehensive legislation:

Officials interested in the enactment of statutes calculated to suppress the activities of anarchists are convinced that it is important that Congress should pass a law which
will make it more difficult for the advocates of violence to secure explosives for use in bombs. The explosives regulation law now in effect is a war-time measure, and will expire with the proclamation of peace. Since the close of hostilities its enforcement has been relaxed considerably in order that dynamite for use in industry might be obtained and utilized with less trouble. It has been noted that as the enforcement of this war statute has relaxed the activities of bomb planters have increased, which has convinced officials that in the interest of the public safety the procurement of explosives should be made as difficult as possible to those who wish to use them in their trade of assassination.

The Senate committee which had under investigation the pro-German propaganda in this country, and which is expected to suggest laws directed at violent radicalism, has given consideration to the explosives question. Van. H. Manning, Director of the Bureau of Mines, likewise has studied the subject and strongly recommends congressional action. Police officials have become convinced that the matter is of importance in suppressing anarchy, and they support the demand for repressive legislation.

With the expiration of the war-time explosives regulation law, unless a new statute is enacted to take its place, it will be comparatively easy for anarchists to secure all the dynamite, T. N. T., or powder they need for their nefarious purposes.

There may be a question as to the most efficacious way in which to proceed to regulate the traffic in explosives in times of peace, but it is generally conceded that some method can be devised which will be constitutional and at the same time effective. Licensing and taxing are the means most generally favored. It is by this method that the traffic in narcotic drugs is regulated by the Federal Government.

The public interest undoubtedly requires that Congress take some action along this line. Practically every city in the country regulates the sale of firearms with the object of protecting its citizens, and it is the same sort of protection upon a larger scale that it is proposed the Federal Government should extend to the people. During 1917 there were 582,475,327 pounds of explosives manufactured in the United States, and since that time the production has been increasing. With this tremendous output every possible means should be employed to prevent any portion of it getting into the hands of those who would use it to spread terror throughout the land.

The operation of the Federal explosive act, a war-time measure, has probably caused some inconvenience and expense to many owners of explosives magazines and to persons using and handling explosives throughout the country. To many this inconvenience and expense was only one of the many hardships and sacrifices incident to our participation in the war. The bill was not designed with the purpose of embarrassing the legitimate manufacturer, but to reach the man who compounded explosives in his back yard or cellar and then used them in destroying innocent men and women. The officers charged with the enforcement were relentless in their search for and tireless in their prosecution of this type of criminal.

Many of the urgent reasons that prompted the enactment of legislation to control the use, storage, and handling of explosives during war time continue. The danger is from another direction. In the attempt to readjust labor problems to the reconstruction period many disordered minds are advocating violence. The following extract (par. 5) from the report of the Senate Judiciary Com-
mittee on German propaganda and Bolshevism throws light on the situation:

Never have the Federal statutes provided adequate security against an unlawful and promiscuous use of high explosives. During the period of American neutrality, the representatives of the German Government, as well as many criminally inclined residents of our own country, resorted to the use of explosives for the destruction of life, property, and transportation facilities, and except for the provisions of the interstate-Commerce act, which prohibited the shipping or carrying of explosives in interstate commerce, the offenses could not be reached by the Federal Government, and when reached under this act the penalties were entirely incommensurate with the offense. The act of Congress of October 6, 1917, entitled "An act to prohibit the manufacture, distribution, storage, use, and possession in time of war of explosives, providing regulations for the sale, manufacture, distribution, storage, use, and possession of same, and for other purposes," was enacted by Congress as a purely war statute, and becomes inoperative upon the restoration of peace. The efficacious effect of this legislation during the period of the war has not only justified its enactment as a war statute, but has impressed upon the people of the country the merit of its provision in times of peace as well as in times of war.

All law-abiding persons recognize the necessity of controlling and regulating the manufacture, distribution, and possession of the instruments of death and destruction relied upon by the criminal and lawless elements of society. The obligation of the Federal Government to protect the lives and property of its citizens would not fully be performed were Congress to permit the act of October 6, 1917, to die by limitation without enacting in its place a peace-time measure.

LEE S. OVERMAN, Chairman.
WILLIAM H. KING.
Josiah O. Wolcott.
Knute Nelson.
Thomas Sterling.

In the United States with the repeal of the war-time Federal explosives act no Federal regulations remain to control the manufacture, transportation, use, storage, and possession of explosives with the exception of the provisions of the Interstate Commerce act, which prohibits the shipment or carrying of explosives except as authorized. In other words, our Federal laws cover only the transportation of explosives.

In England, France, Germany, Italy, Austria, Belgium, and other foreign countries national laws strictly govern the manufacture and handling of explosives. Our country is inadequately protected. Very few of our States have adequate laws or regulations dealing with this important matter.

During the enforcement of the Federal explosives act the numerous licensing agents appointed by the Bureau of Mines uncovered a most deplorable state of affairs. Great stores of explosives were found within the limits of cities and towns where an explosion would have caused tremendous loss of life, limb, and property. In hundreds of places explosives have been abandoned by the owners without any protection whatsoever; thousands of storage places were of such poor construction that any person could enter and obtain ex-
Explosives to use for criminal purposes. This has been the usual course of procedure of safe blowers and other criminals who were unable to secure an explosives license.

As far as the miners of the country are concerned, and in them the Bureau of Mines has possibly the greatest interest, the enforcement of this act has brought about a notable reform which the bureau earnestly hopes will be made permanent. In the mining districts of many States the miners in the past have not only had free access to explosives, but have made it a common practice to carry the explosives to their homes, often in thickly populated mining towns. This was especially common practice in the winter, when the miners took frozen explosives home for the purpose of thawing them. It was not uncommon to find from 50 to 80 pounds of explosives in a single lodging house for miners and to have these houses blown up with all the occupants. Metal miners and coal miners purchased explosives, stored them in their homes in thickly settled districts, and carried them to the mines in any quantity or manner they saw fit. The accident reports show plainly the great loss of life resulting from such practices.

In Kansas, Alabama, Pennsylvania, and other States over 90 per cent of this pernicious practice has been eliminated under the cooperation of the coal operators in issuing and selling explosives to the men at the mines, thereby reducing the necessity of carrying this dangerous material to their lodging houses.

The possession of dangerous explosives by irresponsible and criminal persons constitutes a constant menace to the Nation. The facts uncovered in the enforcement of the explosives-regulation act during the war are such as would surprise and alarm every citizen.

Just as the enforcement of the explosives act has revealed this deplorable state of affairs throughout the country, it has also shown the manner by which such conditions may be remedied. In its brief active existence of less than two years, it developed an organization of over 16,000 persons, only 1 per cent of whom were salaried.

It is important for purposes of national defense, in view of the possibilities of future war, that the National Government should be provided with ample and complete records of every explosives and munition factory in the United States. These files should register the location; kind of explosive or munition manufactured; amount of daily and pressure output; readiness with which plants could be enlarged, and other facts which would be of great value in an emergency. The matter of location is of prime importance, especially with regard to railroads and harbors. It is of interest to note that many such records as have been described are now in the files of the Bureau of Mines. Additional data should be obtained in order to complete the records.
REMOVAL OF RESTRICTIONS.

With the cessation of hostilities the matter of the continuance of the operation of the act of October 6, 1917, which, by its preamble, was to be in force "when the United States is at war," was taken up for consideration and was held to operate until (1) the declaration of peace, or (2) the repeal of the law, or (3) the funds for its administration were exhausted.

The act of October 6, 1917, appropriated for its administration the sum of $300,000, and the sundry civil act of July 1, 1918, appropriated a like sum for the fiscal year 1919. But the sundry civil bill, approved July 19, 1919, directed that "the unexpended balance of appropriations heretofore made for the enforcement of the act * * * shall be covered into the Treasury immediately upon the approval of this act, with the exception of the sum of $15,000 which may be used for expenses incident to concluding the work under said act." Under the act of July 19, 1919, the sum of $118,335.25 was covered into the Treasury, and on November 17, 1920, a balance of $285.40 remained from the $15,000 appropriated "for expenses incident to concluding the work under said act."

The far-reaching effects of the act and more particularly in the application of the regulations to the control of "ingredients" was realized in advance by few, if any, but experience showed that such simple domestic operations as the home curing of pork products was subject to the regulations for licensing nitrates. During active military operations our loyal citizens submitted to these restrictions patiently, and with the cessation of active hostilities as much embarrassment as possible should be removed; hence, under section 18 of the act, the Director of the Bureau of Mines, with the approval of the Secretary of the Interior, issued the following orders curtailing the scope of explosive regulations:

November 14, 1918.

Because no longer required for the public safety the Director of the Bureau of Mines, in charge of explosives regulation, has made the following changes in the General Information and Rulings under the act of October 6, 1917 (40 Stat., 385), and as amended by the sundry civil act of July 1, 1918:

1. All regulations relating to ingredients not used or intended to be used in the manufacture of explosives are revoked and no further license of such ingredients will be required.
2. All regulations relating to fireworks are revoked and no further license of fireworks will be required.
3. All regulations relating to platinum, iridium, and palladium and compounds thereof are revoked and no further license of platinum, iridium, and palladium will be required.

Very truly, yours,

Clarence Hall,
Chief Explosive Engineer.

Approved:
Van. H. Manning,
Director.

Approved:
Franklin K. Lane,
Secretary of the Interior.
REMOVAL OF RESTRICTIONS.

JANUARY 9, 1919.

The Director of the Bureau of Mines in charge of explosives regulation, has made the following changes in the General Information and Rulings under the act of October 6, 1917 (40 Stat., 385), and as amended by the sundry civil act of July 1, 1918:

1. All regulations relating to ammonium nitrate, electric blasting machines, and flashlight powders are revoked and no further license of these commodities will be required.

2. Attention is called to the fact that all articles listed under explosives, page 13, General Information and Rulings for the enforcement of the act, with the exception of ammonium nitrate, electric blasting machines, flashlight powders and fireworks, still require a license.

3. The previous order of November 14, relative to ingredients when purchased for use in the manufacture of explosives still remains in effect.

Very truly, yours,

CLARENCE HALL,
Chief Explosives Engineer.

Approved:
VAN. H. MANNING,
Director.

Approved January 9, 1919.
FRANKLIN K. LANE,
Secretary of the Interior.

MARCH 15, 1919.

Because no longer required for the public safety the Director of the Bureau of Mines, in charge of explosives regulation, has made the following changes in the General Information and Rulings under the act of October 6, 1917 (40 Stat., 385), and as amended by the sundry civil act of July 1, 1918:

1. All regulations relating to the purchase, possession, and use of explosives for reclaiming of land, stump blasting, ditching, and other agricultural purposes are revoked and no further license will be required.

2. These revocations do not allow enemy aliens or subjects of a country allied with an enemy of the United States to manufacture, purchase, or sell, use or possess explosives at any time.

Provided, That nothing in the above shall release any person whosoever from complying with the law in the matter of safeguarding and storing of explosives.

Very truly, yours,

CLARENCE HALL,
Chief Explosives Engineer.

Approved:
VAN. H. MANNING,
Director.

Approved:
ALEXANDER T. VOGELSANG,
Acting Secretary of the Interior.

NOTE.—In order that railroads will accept shipment of explosives without a license, it will be necessary for the shipper to state on bill of lading: “For agricultural purposes.”

In anticipation of the effect of the passage of the sundry civil bill, which became law July 19, 1919, and which was the only existing legislation making appropriation for the administration of “Explosives Regulations,” the Secretary of the Interior, by order of the President, canceled the commissions of each of the United States explosives inspectors on June 30, 1919; and the Director of the Bureau of Mines issued the order following on July 19, 1919.
Notice is hereby given that, in accordance with the following provision of the sundry civil act, approved July 19, 1919,

"The unexpended balance of appropriations heretofore made for the enforcement of the act entitled "An act to prohibit the manufacture, distribution, storage, use, and possession in time of war of explosives, providing regulations for the safe manufacture, distribution, storage, use, and possession of the same, and for other purposes," approved October 6, 1917, shall be covered into the Treasury immediately upon the approval of this act, with the exception of the sum of $15,000 which may be used for expenses incident to concluding the work under said act," it will be impossible, because the funds appropriated are insufficient, to administer in full the act of October 6, 1917, and that, therefore, none of the following licenses under said act will be issued or required, and all such licenses heretofore issued are hereby canceled:

Vendor's license authorizing the purchase, possession, and sale of explosives or ingredients.

Purchaser's license authorizing the purchase and possession of explosives and ingredients.

Foreman's license authorizing the purchase and possession of explosives and ingredients, and the sale and issuance of explosives and ingredients to workmen under the proviso to section 5 of the act.

Analyst's, educator's, investor's, and investigator's licenses authorizing the purchase, manufacture, possession, testing, and disposal of explosives and ingredients.

The following licenses will remain in force and be required until a condition of peace is reached, the act repealed or the operating funds exhausted, when due notice will be given:

Manufacturer's license authorizing the manufacture, possession, and sale of explosives and ingredients.

Exporter's license authorizing the licensee to export explosives, but no such license shall authorize exportation in violation of any proclamation of the President issued under any act of Congress.

Importer's license authorizing the licensee to import explosives.

Applications for licenses under the last three mentioned categories will be made to the Director of the Bureau of Mines, Washington, D.C.

Very truly yours,

VAN. H. MANNING,
Director.

PROPOSED ACT TO REGULATE EXPLOSIVES.

The facts developed in the administration of the act of October 6, 1917, emphasize the need for close supervision over and control of the manufacture, storage, transportation, and use of explosives in order to properly protect the people of this country from accidents occurring from them or outrages committed with them.

As has been pointed out, this may be accomplished by the enactment of a uniform law by each of the States and by the United States to cover its Territories, the District of Columbia, and all other possessions, if such laws are uniformly administered, or, by a single Federal law operating throughout the land. The following is offered as a
proposed form of peace-time legislation which if enacted into law would, when efficiently administered, go far toward securing the protection needed:

For investigations of explosions and fires caused by explosives in mines, quarries, factories, warehouses, magazines, houses, cars, boats, conveyances, and all places in which explosives or the ingredients thereof are manufactured, distributed, stored, or used, with a view to recommending safe methods for the manufacture, distribution, storage, and use of explosives to the end that precautions may be taken to prevent such explosions and fires, and including personal services in the District of Columbia and elsewhere, printing and binding, supplies and equipment, traveling and subsistence expenses, maintenance, repair, hire, and operation of motor-propelled passenger-carrying vehicles, $35,000 or so much thereof as may be required for expenses incurred in connection with the work during the fiscal year ...............: Provided, That the Director of the Bureau of Mines shall, in his discretion, report his findings, in such manner as he may deem fit, to the proper Federal or State authorities, to the end that if such explosion or fire has been brought about by a willful act the person or persons causing such act may be proceeded against and brought to justice; or, if said explosion or fire has been brought about by accidental means, that precautions may be taken to prevent similar accidents from occurring.

ACKNOWLEDGMENTS.

Acknowledgments are cheerfully made to Mr. F. J. Bailey, assistant to the director, Capt. H. D. Trounce, Mr. Charles S. Eby, and Mr. A. C. Yznaga, of the Bureau of Mines, for valuable aid in the gathering of the material for and preparation of this report.
PUBLICATIONS ON INVESTIGATIONS OF EXPLOSIVES.

A limited supply of the following publications of the Bureau of Mines has been printed and is available for free distribution until the edition is exhausted. Requests for all publications can not be granted, and to insure equitable distribution applicants are requested to limit their selection to publications that may be of especial interest to them. Requests for publications should be addressed to the Director, Bureau of Mines.

The Bureau of Mines issues a list showing all its publications available for free distribution as well as those obtainable only from the Superintendent of Documents, Government Printing Office, on payment of the price of printing. Interested persons should apply to the Director, Bureau of Mines, for a copy of the latest list.

PUBLICATIONS AVAILABLE FOR FREE DISTRIBUTION.

Bulletin 17. A primer on explosives for coal miners, by C. E. Munroe and Clarence Hall. 1911. 61 pp., 10 pls., 12 figs.

Bulletin 48. The selection of explosives used in engineering and mining operations, by Clarence Hall and S. P. Howell. 1914. 50 pp., 3 pls., 7 figs.

Bulletin 59. Investigations of detonators and electric detonators, by Clarence Hall and S. P. Howell. 1913. 73 pp., 7 pls., 5 figs.

Bulletin 80. A primer on explosives for metal miners and quarrymen, by C. E. Munroe and Clarence Hall. 1915. 125 pp., 51 pls., 17 figs.

Bulletin 96. The analysis of permissible explosives, by C. G. Storm. 1916. 88 pp., 3 pls., 7 figs.


Technical Paper 89. Coal-tar products and the possibility of increasing their manufacture in the United States, by H. C. Porter, with a chapter on coal-tar products used in explosives, by C. G. Storm. 1915. 21 pp.

Technical Paper 125. The sand test for determining the strength of detonators, by C. G. Storm and W. C. Cope. 1916. 68 pp., 2 pls., 5 figs.


Miners' Circular 7. Use and misuse of explosives in coal mining, by J. J. Rutledge, with a preface by J. A. Holmes. 1913. 52 pp., 8 figs.

PUBLICATIONS THAT MAY BE OBTAINED ONLY THROUGH THE SUPERINTENDENT OF DOCUMENTS.

Bulletin 15. Investigations of explosives used in coal mines, by Clarence Hall, W. O. Snelling, and S. P. Howell, with a chapter on the natural gas used at Pittsburgh, by G. A. Burrell, and an introduction by C. E. Munroe. 1911. 197 pp., 7 pls., 5 figs. 25 cents.
Bulletin 51. The analysis of black powder and dynamite, by W. O. Snelling and C. G. Storm. 1913. 80 pp., 5 pls., 5 figs. 10 cents.
Technical Paper 69. Production of explosives in the United States during the calendar year 1912, compiled by A. H. Fay. 1914. 8 pp. 5 cents.
Technical Paper 146. The nitration of toluene, by E. J. Hoffman. 1916. 32 pp. 5 cents.
Technical Paper 159. Production of explosives in the United States during the calendar year 1915, with notes on coal-mine accidents due to explosives, and a list of permissible explosives, lamps, and motors tested prior to June 1, 1916, compiled by A. H. Fay. 1916. 24 pp. 5 cents.
Technical Paper 192. Production of explosives in the United States during the calendar year 1917, with notes on coal-mine accidents due to explosives and list of permissible explosives, lamps, and motors tested prior to March 31, 1918, compiled by A. H. Fay. 1918. 21 pp. 5 cents.