

# UNITED STATES PATENT OFFICE.

GERSHOM MOORE PETERS, OF CINCINNATI, AND MILTON FLETCHER LINDSLEY, OF KINGS MILLS, OHIO, ASSIGNORS TO THE KING POWDER COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

## EXPLOSIVE.

991,232.

Specification of Letters Patent.

Patented May 2, 1911.

No Drawing.

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*To all whom it may concern:*

Be it known that we, GERSHOM M. PETERS, residing at Cincinnati, county of Hamilton, and State of Ohio, and MILTON F. LINDSLEY, residing at Kings Mills, county of Warren, and State of Ohio, both citizens of the United States, have invented certain new and useful Improvements in Explosives, of which the following is a full, clear, and exact specification.

The invention relates to high explosives equaling in strength the higher per cents. of standard dynamite.

Black powder for blasting purposes is not of sufficient strength for most rock work, and is not capable of throwing out the tougher kinds of coal and slate often accompanying the same. It also shatters the softer grades of coal and renders much of it unsalable. It emits an offensive gas and causes such an obscuring smoke as to seriously interfere with the workmen. It also is liable by its excessive flame to set off any damp or explosive gas that may be lurking in the mine, causing often great destruction to life and property. It is also more or less dangerous with respect to transporting and storing, as it may be easily set off by a spark or fire.

Dynamite as generally known and used is open to many objections. It freezes at forty-five degrees temperature, and when frozen will not explode or detonate, and is practically useless. The thawing of it out is attended often with great inconvenience and hazard. In hot weather, the nitroglycerin in dynamite is likely to exude from the absorbent, which makes it exceedingly dangerous to handle or transport. If not properly made and thoroughly neutralized, which is very likely to be the case because of ignorant or careless employees, decomposition is likely to set in, which has frequently been the cause of most frightful accidents. Dynamite is also liable to be detonated by a sudden jolt or shock, and as a result serious accidents often happen with the best grades of dynamite, apparently without cause or explanation. All of these objectionable features are intensified as the per cents. of strength of dynamite are increased, so that when it is made to contain a large amount of nitro-glycerin, reaching as high as seventy-five or eighty per cent. or more, it exudes

more readily, is more sensitive, and is much more powerful in its destructive energy.

It is the object of our invention to furnish an improved explosive equaling in strength the higher per cents. of dynamite, which will at the same time be safe to handle and transport, and which will not freeze or exude, or spontaneously detonate.

Aside from the risks and liabilities in handling and in using dynamite, it is objectionable for many kinds of work, as, for example, coal mining, as it is too violent and is found to shatter too much of the coal; also in close mining or tunnel work the air becomes speedily impregnated with offensive and poisonous gases from the explosive materials, making it impossible or dangerous at times for men to work. It is also found that the shocks from such explosives are so severe that they stir up all the latent gases in the mines, and also cause secondary explosions of a serious nature; and a further object of the invention is to produce an improved form of explosive equaling in strength the higher per cents. of dynamite, but in which these objectionable features last mentioned are reduced to the minimum. To accomplish this purpose a combination of three ingredients, which have heretofore been used to some extent in certain combinations in the production of explosive compounds, is used. These ingredients consist of nitrate of ammonia, chlorate of potassium, and "mirbane oil." To these ingredients a certain amount of any suitable cellulose fiber as wood meal preferably made from white pine is added in order to lighten up the mass and aid in the rapid transmission of heat and force. The preferred proportions are as follows:

|                       |              |    |
|-----------------------|--------------|----|
| Nitrate of ammonia    | 50 per cent. |    |
| Chlorate of potassium | 30 per cent. | 95 |
| Mirbane oil           | 10 per cent. |    |
| Wood meal             | 10 per cent. |    |

Making a total of 100 per cent. 100

This formula gives a strength of about sixty per cent. dynamite, the quantities of each being equal. The nitrate of ammonia has great explosive force because of its capacity for rapid and extensive production of gas, while the combination of chlorate of

potassium and mirbane oil is capable of great explosive force because easily susceptible of detonation. The mirbane oil or the pasty condition of the explosive due to its use serves as a protection to the nitrate of ammonia, which rapidly deteriorates when exposed to the atmosphere. As a further precaution, however, it is preferred to pack this explosive, when prepared and ready for use, in hermetically-sealed cases. The wood meal is added to lighten the mixture, to furnish necessary carbon and to quicken the flame by aiding in its rapid distribution. Wood meal prepared from white pine is preferred. The solids, consisting of the nitrate of ammonia, chlorate of potassium and wood meal, after being pulverized, are thrown together in a mixer in approximately the proportions above designated, then the ten per cent. of nitro-benzene is poured over the mass, and all are thoroughly worked into one substance, after which the explosive is packed in cartridges, ready for use. When used it is fired by means of a primer as in the use of dynamite.

We claim:

1. An explosive compound consisting of a

mixture of nitrate of ammonia, chlorate of potassium, mirbane oil, and wood meal.

2. An explosive compound containing the following ingredients in substantially the proportions indicated, nitrate of ammonia fifty per cent., chlorate of potassium thirty per cent., mirbane oil ten per cent., and wood meal ten per cent.

3. An explosive compound consisting of nitrate of ammonia, chlorate of potassium, finely divided cellulose, and mirbane oil all in a thoroughly intermixed mass.

4. An explosive compound consisting of nitrate of ammonia, potassium chlorate, finely divided cellulose, all intermixed with mirbane oil to render the mass plastic.

In testimony whereof we have signed our names to this specification, in the presence of subscribing witnesses, on this 3d day of June A. D. 1907.

GERSHOM MOORE PETERS.  
MILTON FLETCHER LINDSLEY.

Witnesses:

ELDON R. JAMES,  
A. W. BECKLEY,  
ED FROHLIGER.