

UNITED STATES PATENT OFFICE.

FRANS GUSTAF ABEL BROBERG, OF EMPORIUM, PENNSYLVANIA, ASSIGNOR
OF ONE-HALF TO DAVID LUNDY WILDRICK, OF DOVER, NEW JERSEY.

HIGH EXPLOSIVE.

SPECIFICATION forming part of Letters Patent No. 542,724, dated July 16, 1895.

Application filed September 11, 1894. Serial No. 523,750. (No specimens.)

To all whom it may concern:

Be it known that I, FRANS GUSTAF ABEL BROBERG, a subject of the King of Sweden and Norway, (but having declared my intention of becoming a citizen of the United States,) residing at Emporium, in the county of Cameron and State of Pennsylvania, have invented certain new and useful Improvements in High-Power Explosives; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in high-power explosives; and it consists essentially in the product formed by mixing together nitro-naphthalenes with nitro-glycerin, to which nitro cellulose may or may not be added, and in then adding carbon when required and an oxidizing agent.

The nitro-naphthalenes are non-volatile at the ordinary temperature and assist in the rapid gelatinization of the nitro-cellulose in the mixture containing nitro-glycerin and rendering the explosive formed by the mixture with the carbon and the oxidizing agent permanently plastic, whereas most of the solvents for nitro-cellulose now in use are volatile and evaporate from the mixture, leaving the powder dry and hard. It will also be noted that the herein-described non-volatile agent while assisting in the gelatinization of the nitro-cellulose will tend to make the explosive safer.

To the ingredients above noted sulfur may or may not be added, but in low grades of dynamite manufactured in accordance with my invention sulfur should preferably be used.

The nitro-naphthalenes used in the herein-described explosive should preferably be prepared by treating naphthalene with nitric acid, about 40° Baume, in or about equal parts by weight of acid and naphthalene. The product of the reaction will ordinarily be a mixture of the mono, di, and tri nitro-naphthalenes, (chiefly mono, and probably very little tri nitro-naphthalene.) The crude nitro-naphthalenes thus prepared and having been thoroughly freed from adhearing acid are added to the nitro-glycerin or to the mixture

of nitro-glycerin and nitro-cellulose and thoroughly mixed therein, and then the mixture may be used with asimple absorbent, as in ordinary dynamite; or to it may be added carbon and an oxidizing agent, or an oxidizing agent only, and also sulfur may or may not be added.

The following mixtures are suggested as illustrating the invention:

First. Nitro-naphthalenes, eight per cent.; nitro-glycerin, twenty per cent.; nitro-cellulose, one per cent.; nitrate of soda, sixty-four per cent.; sulfur, seven per cent.

Second. Nitro-naphthalenes, two per cent.; nitro-glycerin, fifty-eight per cent.; wood pulp, fifteen per cent.; nitrate of soda, twenty-five per cent.

Third. Nitro-naphthalenes, 2.5 per cent.; nitro-glycerin, forty-five per cent.; nitro-cellulose, 1.5 per cent.; wood pulp, seven per cent.; nitrate of soda, forty-four per cent.

Fourth. Nitro-naphthalenes, 3.75 per cent.; nitro-glycerin, thirty-two per cent.; nitro-cellulose, 1.25 per cent.; wood pulp, four per cent.; nitrate of soda, fifty-three per cent.; sulfur, six per cent.

The proportions of the ingredients may be varied widely, however, dependent upon the required degree of strength of the explosive.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A high-power explosive consisting essentially of nitro-glycerin, nitro-naphthalenes, wood pulp, nitrate of soda, and sulfur.

2. A high-power explosive consisting essentially of nitro-glycerin, nitro-cellulose, nitro-naphthalenes, wood pulp, nitrate of soda, and sulfur.

3. A high-power explosive, consisting essentially of nitro-glycerin, nitro-naphthalenes, wood pulp, and nitrate of soda.

4. A high-power explosive, consisting essentially of nitro-glycerin, nitro-cellulose, nitro-naphthalenes, nitrate of soda and sulfur.

In testimony whereof I affix my signature in presence of two witnesses.

FRANS GUSTAF ABEL BROBERG.

Witnesses:

FRANKLIN HAUSLER,
JOHN J. HINKLE.