

UNITED STATES PATENT OFFICE.

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EXPLOSIVE.

1,061,774.

Specification of Letters Patent.

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No Drawing. Original application filed November 22, 1910, Serial No. 593,713. Divided and this application filed December 18, 1911. Serial No. 686,360.

To all whom it may concern:

Be it known that I, SIGURD ADOLF GUSTAFSSON NAUCKHOFF, civil engineer, subject of the King of Sweden, residing at Vinterviken, Liljeholmen, in the Kingdom of Sweden, have invented certain new and useful Improvements in Explosives, of which the following is a specification.

This is a division of my application filed November 22nd, 1910, Serial No. 593,713, and priority is claimed for the present application from the date of said application.

This invention relates to explosives.

It has long been found desirable to have an explosive which is better suited than dynamite for blasting in loose mines, frozen earth and the like, that is an explosive of smaller shattering power but possessing however the valuable properties of dynamite such as plasticity, immunity to moisture and relatively great non-susceptibility to concussion. The explosives which have heretofore replaced dynamite for the purposes stated, were principally ammonium nitrate or ammonium perchlorate explosives, but these are usually manufactured in the form of powder and therefore not well adapted for the above purposes.

The object of the present invention is an improved explosive possessing the valuable properties of dynamite as regards plasticity, immunity from moisture, etc., in combination with the strength and shattering power suited to its purpose, and resistance to frost.

The invention consists in utilizing as a chief constituent of the explosive, so called commercial liquid dinitrotoluene with or without the addition of other substances dissolved therein, gelatinized by means of nitro-cellulose, this material being mixed with finely powdered, oxygen yielding substances such as ammonium perchlorate nitrates of the alkalis, and the like. The gelatin obtained in this manner is mixed with a suitable quantity of oxygen yielding substances

such as nitrates, perchlorates, chromates and the like, for example ammonium perchlorate, sodium and potassium nitrate, whereby an explosive is obtained which is very similar in external properties to the so called "extra-dynamite." As an example of the composition of such an improved explosive the following is given: 31% gelatinized dinitrotoluene consisting of 4% nitro-cellulose and 96% of so called commercial liquid dinitrotoluene, 43% ammonium perchlorate, 26% sodium nitrate.

It is known in the manufacture of explosives, for example in the making of "plastomenit" to gelatinize solid nitro compounds of hydrocarbons, and in other explosives di- and trinitrotoluene in molten condition are used whereby a product is obtained possessing at ordinary temperatures the consistency of hard indiarubber and used alone as a substitute for indiarubber, celluloid, etc., or in combination with oxygen-yielding substances, as an explosive.

According to the present invention and as hereinbefore stated solid dinitrotoluene not used but so called commercial liquid dinitrotoluene by means of which a gelatin is obtained which retains its plasticity even at low temperature and is therefore well adapted as a constituent of plastic explosives.

Having thus described my invention, I declare that what I claim is:

An improved explosive comprising a mixture of about 31% of so called commercial liquid dinitrotoluene gelatinized with nitro-cellulose, 43% of ammonium perchlorate and 26% of alkaline nitrate.

In witness whereof I have hereunto set my hand in presence of two witnesses.

SIGURD ADOLF GUSTAFSSON NAUCKHOFF.

Witnesses:

AUG. HAGELIN,

ALMA PETTERSON.