

UNITED STATES PATENT OFFICE.

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EXPLOSIVE COMPOUND.

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To all whom it may concern:

Be it known that I, ROBERT W. WARREN, of the city of San Francisco, in the county of San Francisco and State of California, have
5 invented a new and useful Improvement in the Manufacture of Explosive Compounds for Blasting and other Purposes; and I hereby declare the following specification to be a full and clear description of the same.

10 My invention relates to the manner of treating and combining liquid and dry explosives so as to form from them a dry compound. The explosives I use are nitro-glycerine, nitro-cellulose, tri-nitro-cellulose, and gunpowder, and
15 I combine them in the following manner:

To any desired quantity of properly-prepared nitro-glycerine I add nitro-cellulose (either in the form of mono-nitro-cellulose, di-nitro-cellulose, or tri-nitro-cellulose) in sufficient quantity to produce a coagulated mass, which
20 would be in the proportion of about one part of such nitro-cellulose to ten parts of nitro-glycerine, and allow this mass to stand until the nitro-cellulose has become entirely dissolved without the use of heat. I then take
25 carefully-pulverized tri-nitro-cellulose and mix it with the coagulated mass until all is brought to the consistency of a dry powder. To this dry compound so produced I add gunpowder,
30 which, in order to obtain the best effect, should be pressed and glazed, when it acts more readily as a delagator.

The proportion of gunpowder used in the composition will depend on the character of
35 the compound required; but the proportion of nitro-glycerine, nitro-cellulose, and tri-nitro-cellulose will seldom vary to any great extent, and the manner of mixing these ingredients and reducing them to a dry powder before
40 adding the gunpowder must always be carefully observed.

If a large percentage of gunpowder is used its comparatively slow effect will predominate, while if only a small proportion of gunpowder
45 be introduced into the compound its chief function will be to promote the explosion of the compound, and the properties of the other components will predominate.

Where seventy parts of gunpowder are mixed

with thirty parts of the dry powder a compound 50 suitable for blasting purposes is obtained.

The effect of the explosion of a given quantity of this improved compound is in all cases greater than the sum of the destructive effects of the individual elements separately exploded, 55 no matter what proportion of gunpowder is used.

The object of my invention is to produce an explosive compound containing nitro-glycerine and gunpowder in certain desired proportions, 60 and at the same time, by a proper treatment of the nitro-glycerine before combining it with the gunpowder, prevent the destruction or diminution of the delagatory properties of the gunpowder by its becoming wet or damp from 65 absorption of the nitro-glycerine.

I am aware that mixtures of nitro-glycerine and gun-cotton have been made, and that mixtures of nitro-glycerine and gunpowder are in common use; but in the first-named of these 70 mixtures the effect of the explosion is not sufficiently modified to render the compound fit for general use as a blasting agent, nor is there any economy in its use over nitro-glycerine or gun-cotton used separately, while in the usual 75 modes of combining gunpowder with nitro-glycerine the gunpowder is rendered wet or damp by absorbing the nitro-glycerine, and its valuable property of being readily ignited and serving as an instantaneous promoter of 80 the explosion is thereby sacrificed.

What I claim as my invention is—

1. The within-described process of preparing an explosive compound consisting in first reducing nitro-cellulose and nitro-glycerine to 85 a coagulated mass, and then adding tri-nitro-cellulose until a dry powder is produced, and finally combining therewith gunpowder, substantially as shown and described.

2. An explosive compound composed of gun- 90 powder mixed with a powder made of nitro-glycerine, nitro-cellulose, and tri-nitro-cellulose, all combined substantially as described.

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Witnesses:

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