

# UNITED STATES PATENT OFFICE.

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## DYNAMITE

SPECIFICATION forming part of Letters Patent No. 347,424, dated August 17, 1886.

Application filed September 4, 1884. Serial No. 142,233. (No specimens.)

### *To all whom it may concern:*

Be it known that I, MANUEL EISSLER, of the city of New York, in the county and State of New York, have made certain new and useful  
5 Improvements in the Manufacture of Explosive Compounds; and I hereby declare the following to be a full and clear description of the same.

In the manufacture of explosive compounds  
10 containing liquid explosives, such as nitro-glycerine, it is very desirable to produce them of such a consistence and composition that contact with water will not affect their explosive properties, and that the compound may contain a large proportion of the liquid explosive.  
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The object of my invention is to produce an explosive compound which will be capable of containing a very large quantity of nitro-glycerine, together with non-absorbent combustible granules of nitrate of potash or soda or other nitrate salts without any danger of the nitro-glycerine leaking out of the compound, the  
20 compound being also unaffected by moisture or contact with water.

I am aware that it has long been the practice to mix some combustible resinous or gummy substance with the granules of nitrate salts, either separate or combined with a carbon, so that the resinous or gummy substance will coat  
25 and render the granules of nitrate salts impervious to moisture. Granules of nitrate salts so prepared, with an outer covering of resin, have been mixed with nitro-glycerine and an explosive compound thus produced; but such compound will only admit of the use  
30 of a limited proportion of the liquid nitro-glycerine with safety, as the non-absorbent granules allow the nitro-glycerine to leak when in excess of a very thin coating. In  
35 the use of such a compound composed of granules with a liquid explosive in cases where there is great moisture, the presence of such moisture will cause deliquescence and separate the granules and constituent parts of the  
40 compound, so as to destroy or impair its explosive qualities. This disintegration of the compound takes place in the use of all explosive compounds in which nitro-glycerine is used, and held in place by the capillary attraction of the solid particles of the compound  
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when such compounds come in contact with great moisture, which is the case when they are used under water. By my improved process of manufacture and combination of ingredients I produce an explosive compound containing a very large percentage of nitro-glycerine combined with non-absorbent granules of nitrate salts, which will not become dangerous from leakage, and is free from the injurious effects of moisture even when immersed in  
55 60 water.

In making my explosive compound I first take a liquid explosive, such as nitro-glycerine, and mix with it about five per cent. of nitrated cellulose or some fibrous material, such as collodion-cotton and the various species of nitrated cellulose, by which I obtain a thick sirupy substance, something similar to thin gelatine. I then prepare non-absorbent combustible granules of nitrate salts by grinding nitrate of potash or soda finely and pouring on it a melted mixture composed of fifteen parts of resin, colophony, or tar, and five parts of paraffine melted together. The resin and paraffine is hot and in liquid form when poured  
65 70 75 on the nitrate salts, and the combined mixture should be thoroughly stirred until all the granules of the nitrate salts are coated with the paraffine and resin. This will take about seven parts of the paraffine and resin mixture to one hundred parts of the nitrate salts. After the mass of coated granules or of nitrate salts is cool, the parts are ready for the final mixing of the different ingredients. To forty  
80 85 90 parts, by weight, of the coated granules of nitrate salts I add about seven parts of wood or paper pulp, together with about three parts of dextrine, or rye-flour, or glucose, and after intimately mixing them together, fifty parts of the mixture No. 1 (composed of gelatinized nitro-glycerine) is added. The whole mass being now kneaded together, a uniform plastic mass is formed, as the dextrine or rye-flour will act as a binding agent between the other ingredients.  
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The above will make a very strong explosive compound, which is not affected by contact with or submersion in water.

The proportion of melted resin and paraffine to the nitrate salts will not vary, nor will the  
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quantity of cellulose in the sirup or gelatinized nitro-glycerine; but the proportions of the mixture No. 1 to the granules of nitrate salts may be varied, and will only increase or decrease the explosive force of the compound.

The proportion of the dextrine or binding agent and the wood pulp will also slightly vary with the proportion of mixture No. 1 to the dry granules of nitrate salts, sufficient quantity of the binding agent and wood pulp only being used to bring the compound to a consistence about that of dough.

In case a large proportion of tar or the nitrated cellulose is used to mix with the nitrate salts or nitro-glycerine, the quantity of wood pulp required will be small; or it may be omitted altogether, as it is used more particularly to supply carbon to the compound.

This compound may be placed under water without any protection for a considerable length of time without injury to its explosive qualities. It is readily exploded from concussion—such as the discharge of a fulminate-gap embedded in it, which may be detonated by means of electricity or, otherwise.

I am aware that a compound of unnitrated cellulose and nitro-glycerine is described as being mixed with niter in Patent No. 242,783 to John M. Lewin; but I do not desire to use or claim such a compound, nitrated cellulose being used by me; and I am also aware of the fact that coated granules are described as being mixed with about fifteen per cent. of liquid nitro-glycerine in Patent No. 183,764, granted to Egbert Judson, and I do not desire to use or claim such a compound; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

An explosive compound comprising coated non-absorbent granules of nitrate salts, nitro-cellulose, and nitro-glycerine, first chemically amalgamated, and rye-flour as a binding agent, combined together, substantially as and for the purposes described.

MANUEL EISSLER.

Witnesses:

R. W. WARREN,

A. BELL MALCOMSON, Jr.