UNITED STATES PATENT OFFICE.

EGBERT JUDSON, OF SAN FRANCISCO, CALIFORNIA.

DYNAMITE.

SPECIFICATION forming part of Letters Patent No. 420,626, dated February 4, 1890.

Application filed June 7, 1889. Serial No. 313,494. (No specimens.)

To all whom it may concern:

Be it known that I, EGBERT JUDSON, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Nitro-Glycerine Explosive Compounds, of which the following is a specification.

My invention consists in a new nitro-glycerine explosive compound, the base of which is a nitrate or its equivalent, having the grains or particles coated and protected by a paste consisting of cereal or leguminous powders combined with nitro-glycerine.

I give the following illustrative example: I take about forty pounds of nitro-glycerine and mix it with fifteen pounds of powdered cereal product, such as flour, cornmeal, barley-meal, &c., ground as fine as possible, (the finer the better.) I prefer to use barley-meal, since it is cheaper and possesses the necessary qualifications. With the paste thus formed I mix, say, forty to forty-five pounds of nitrate, either of soda, ammonia, potash, or other suitable gas-producing base. The grains or particles of the base become, after thorough mixing, thoroughly coated with the protecting-paste which contains the nitro-glycerine.

Prior to my invention carbon in the shape of coal, wood pulp, or otherwise has been used. The cereal or leguminous product in the protective paste takes the place of this carbon, and from its nature possesses many advantages over wood pulp or coal and obviates the many disadvantages found in their use.

As is well known, explosive compounds in which carbon or wood pulp and nitrates and nitro-glycerine form the constituents are dangerous to handle, give off noxious and even deadly fumes when exploded, and are susceptible to the variations in climate and to moisture in the atmosphere. The nitrates in such compounds freely absorb the water from the atmosphere through the pores of the carbon or wood pulp, and their usefulness and solidity are thereby destroyed.

I find that the cereal or leguminous product which I use in the form of a paste to coat and protect the grains or particles of the nitrate is better and cheaper than coal or wood pulp, because the latter needs to be kiln-dried and requires more expensive labor to prepare, while the meal does not, and is in itself more costly than the meal. It possesses the following advantages: My paste is not porous, and will not allow the nitro-glycerine to run out. It renders the nitrate powders non-deliquescent even in the case of the most deliquescent nitrate of ammonia. It takes or absorbs and holds the nitro-glycerine as a pasty mass. After the compound has been exploded there is no ash or similar residuum, and little or no noxious fumes are given off. The transportation of explosive compounds or powders thus coated is safer, since they will not explode easily with friction, and they will not burn rapidly. I have found that a small proportion of sulphur—say five per cent. or more—can be used in the new explosive compound, such use being beneficial, because the sulphurous fumes tend to neutralize the nitrous fumes.

The explosive compound formed according to my invention is heavy and compact, and the same amount of gas-producing material will occupy less space than in the case of most other powders. This is an invaluable advantage in blasting, &c.

I am aware that small proportions of flour meal and starch have previously been used with wood pulp and other ingredients and with nitro-glycerine for various purposes, but never to my knowledge in explosive compounds containing nitro-glycerine in proportions large enough to make of themselves a practically protective coating and at the same time furnishing the necessary carbon for combustion.

I do not limit myself to any special mode of manufacture of my powder, the essential being only that the resulting product should be one having a gas-producing base coated and protected by a paste which will supply the necessary carbon and be formed of cereal or leguminous powder and nitro-glycerine.

Having described my invention, what I claim as my invention, and desire to secure by Letters Patent, is—

1. A protected powder consisting of a base of nitrate or equivalent gas-producing ma-

terial, the grains or particles of which are coated and protected by a paste, consisting of a cereal or leguminous powder combined with nitro-glycerine, substantially as described.

2. A protected powder consisting of a base of nitrate or equivalent gas-producing material, the grains or particles of which are coated and protected by a paste consisting of barley-meal combined with nitro-glycerine, substantially as described.

EGBERT JUDSON.

Witnesses:
HENRY E. EVERDING,
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