UNITED STATES PATENT OFFICE.

ALEXANDRE JOSEPH MARIN, OF LAEKEN, NEAR BRUSSELS, BELGIUM.

PROCESS OF MAKING A DETONATING EXPLOSIVE.

1,200,456. Specification of Letters Patent. Patented Nov. 28, 1916.

No Drawing. Application filed April 2, 1914. Serial No. 829,058.

To all whom it may concern:

Be it known that I, ALEXANDRE JOSEPH MARIN, a subject of the King of Belgium, residing at Laeken, near Brussels, Belgium, have invented new and useful Improvements in Processes of Making Detonating Explosives; and I do hereby declare the following to be a full, clear, and exact description of the same.

When dissolving, in the hot state, chlorate of lead in glycerin, it will be observed in course of time and during cooling, that an abundant deposit is formed, composed of fine, white crystals having silken brightness. The said crystalline powder, separated from the excess of glycerin and washed with alcohol, constitutes a very powerful detonating substance showing great analogy with fulminate of mercury and the diazobenzol salts.

The body behaves well within moist atmosphere, it is not readily soluble in water and its solutions evaporating spontaneously when exposed to air, leave as a residuum the detonating body. This substance may, without danger and after moistening with alcohol, be mixed with various combustible bodies, explosives, burning or even inert substances, paraffin, trinitrotoluene, tri- and tetranitronaphthalene, nitrocellulose, chlorate of potassium or of baryta, perchlorate of ammonia, nitrate of baryta, chromates, etc., and when being mixed simultaneously with burning and combustible substances or reduction bodies, such as cyanids and sulfocyanids of copper, of lead, etc., and with nitrocellulose and the new fulminating body, there will easily be obtained a viscous and thick paste. By adding thereto ether, the said paste allows of the manufacture of primings for guns.

Generally, the mixtures, in which is incorporated the detonating body, resulting from the glycerin acting upon the basic chlorate of lead, as well as the said body in pure state, may be adapted for the manufacture of primings for detonating fuses for rockets, composition for fireworks and even inflammable compositions for matches. The said body may further enter into the composition of special explosives and may be used, in a small quantity, for the purpose of increasing the aptitude as to the detonation of certain mine explosives.

Basic chlorate of lead in a concentrated aqueous solution forms with mannite, sugar, glucose, dextrin and even with tannin, more or less crystallized or amorphous compounds. All these products explode violently by means of heat or shocks. However, the violence of explosion is less than with the glycerin composition.

If basic perchlorate of lead (or neutral perchlorate of lead simultaneously with oxid of lead) is caused to act upon glycerin, there will be obtained a detonating combination, similar to that obtained with basic chlorate of lead, but crystallizing with difficulty and being very soluble, even in alcohol. All these detonating products may, in the same manner as the glycerin composition, constituted with basic chlorate of lead, be mixed with the oxidizing salts of combustibles and of various explosive substances, and they may be adapted for the same uses as the explosive mixtures prepared with the glycerin combination of basic chlorate of lead. Besides these reactions, I have found that a similar reaction will be produced also between basic chlorate of lead, mannitan and the glucosones, or (which is quite the same) by causing neutral chlorate of lead, simultaneously with oxid or hydrate of lead, to act upon the said substances. Usually, one molecule of neutral chlorate of lead, one molecule of glycerin, of mannite or of any other polyatomic alcohol, and one molecule of plumbic oxid or hydrate respectively are caused to react. By causing two molecules of plumbic oxid or hydrate to react, there will be obtained products being very little soluble in water, but being always highly detonating. One of these compounds is for instance obtained by causing one molecule of basic chlorate of lead, one molecule of plumbic hydrate to act upon one molecule of mannite or of mannitan. Likewise, a solution of bibasic or tribasic acetate of lead gives instantaneously in presence of a readily soluble chlorate, such as chlorate of soda, of calcium, of magnesium or of ammonium or by addition of alcohol, with mannite, mannitan or even with glycerin, fulminating compounds.

When allowed to dry, the amorphous or crystallized fulminating products show tendency to agglomerate in more or less large pieces. In order to have their pulverization avoided (on account of great danger being run), there will be added, at the completion of the preparation and in the proportion of from one fifth to one twentieth of the weight of the explosive, amylic

alcohol or any other liquid insoluble in water, volatile and having its boiling point at a temperature exceeding 100° C. at atmospheric pressure. The said liquids are evaporated in vacuo.

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

1. The process of making detonating products which consists in treating chlorate of lead or its described equivalents with glycerin or its described equivalents.

2. The process of making detonating products which consists in treating chlorate of lead or its described equivalents with glycerin or its described equivalents, and treating the resulting substance with a substance insoluble in water, volatile, and having its boiling point above 100° C. at atmospheric pressure.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDRE JOSEPH MARIN.

Witnesses:
RUDOLPHE SAMHOF,
CHAS. ROY VASMIT.