UNITED STATES PATENT OFFICE.

BERNHARD LEPSIUS, OF GRIESHEIM, GERMANY.

PREPARING EXPLOSIVE COMPOUNDS.

SPECIFICATION forming part of Letters Patent No. 492,089, dated February 21, 1893.

Application filed September 29, 1892. Serial No. 447,318. (No specimens.)

To all whom it may concern:

Be it known that I, BERNHARD LEPSIUS, a subject of the Emperor of Germany, and a resident of Griesheim, near Frankfort-on-the Main, Germany, have invented new and useful Improvements in Explosive Compounds, of which the following is a specification.

In constructing explosives of picric acid, this acid is generally poured in a liquid state into a container (grenade, torpedo, &c.) or stamped into it in a dry condition. Both these methods are dangerous to a certain extent. It would therefore be desirable to shape the explosive outside the container. Among the binding means which may be employed for this purpose, such are preferable which have a lower melting point than the picric acid. They must furthermore, so as not to interfere with the solidity of the charge, not act chemically upon the explosive; they must not be hygroscopic; they must not become soft in warm rooms or in hot weather; must be easily obtained in a pure state, or, if possible, have explosive properties themselves, in order that the explosive strength of the picric acid may not be diminished too much. These conditions are best fulfilled by tri-nitrotoluol, a perfectly indifferent and harmless substance, easily obtained in a pure state, having a melting point at 82° centigrade.

The explosives are constructed in the following manner: The mixture of picric acid and five to ten per cent. tri-nitrotoluol is put into corresponding forms or molds, and is heated with or without pressure for a short time to a temperature which is above the fusing point of the tri-nitrotoluol, and below that of the picric acid crystals. The tri-nitrotoluol melts and cements the picric acid crystals together, so that the mixture forms a solid mass after it has cooled.

The construction of these explosives is perfectly harmless, the explosives themselves being utterly harmless when handled or being transported. The tri-nitrotoluol is itself an explosive, but of less explosive power than the picric acid. A small addition will not materially affect the action of the picric acid, but in mining and road construction, as well as for military uses, it is sometimes better to diminish the explosive power of the picric acid. By a larger or smaller addition of tri-nitrotoluol this is easily accomplished.

When used for mining or technically, the mixture is preferably shaped like a cartridge. In order to prevent a dusting off at the surface of such cartridges, they are covered with a coating of paraffine or similar substance.

In place of tri-nitrotoluol, similar nitro-substances may be used which have a melting point below that of picric acid, as for instance, di-nitrotoluol, di-nitrophenol, di-nitrocresole and tri-nitrocresole, tri-nitrobenzole, di-nitrobenzole, nitrated xylole or naphthaline, &c.

What I claim as my invention is—

The process of forming explosive compounds in which the picric acid used for filling projectiles, &c., is put into a solid condition, which consists in heating together in a suitable mold a mixture of picric acid and an enveloping, explosive agent, such as tri-nitrotoluol, to a point above the fusing point of the latter and below that of the former, to avoid fusing the crystals of the acid, then cooling the mixture, thus cementing together the crystalline acid, substantially as described and for the purposes set forth.

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

BERNHARD LEPSIUS.

Witnesses:

FRANZ HASSLACHER,

FRIEDRICH QUEHLY.