

UNITED STATES PATENT OFFICE.

ADAM CHARLES GIRARD, OF PARIS, FRANCE.

PROCESS OF MAKING EXPLOSIVES.

SPECIFICATION forming part of Letters Patent No. 683,116, dated September 24, 1901.

Application filed February 3, 1900. Serial No. 3,823. (No specimens.)

To all whom it may concern:

Be it known that I, ADAM CHARLES GIRARD, a citizen of the Republic of France, residing at Paris, France, have invented certain new and useful Improvements in or Relating to the Manufacture of Explosive Substances, (for which application for patent has been made in England under No. 213, dated January 3, 1900, and in France, dated December 27, 1899,) of which the following is a specification.

The present invention relates to the use of alkaline picrates, alkaline earth picrates, and metallic picrates prepared in oil in the manufacture of explosive substances.

It is well known that the picrates constitute a class of explosive which are not characterized by great power, but which, however, are very sensitive to shock and readily ignite. They are therefore not employed alone, partly because they are very dangerous and partly on account of their high price considering their power. Their application, however, is of considerable importance, inasmuch as they allow, when employed in small proportions in the composition of certain explosives, of varying the properties of such explosives. They increase the explosion-wave, giving to the explosive great rapidity, and contribute to obtaining the maximum useful effect, acting as fulminates within the mass.

The oil mixture of the picrates may be applied to ~~powders having~~ alkaline nitrate, chlorate, or perchlorate bases, as well as to explosives having bases of nitroglycerin or guncotton.

To manufacture explosives of alkaline chlorates, perchlorates, or nitrates, the necessary quantity of picrate intended to be employed in the explosive should be prepared in oil. To this mass is then added either the nitrated derivative or the nitrogen derivative to be dissolved in the oil, and finally when the solution has been effected by heat the alkaline chlorate, perchlorate, or nitrate, referred to in several of the claims as "chlorate," which term embraces equivalent substances, is incorporated in a state of powder. Thus, for example, a chlorate explosive may be composed as follows: perchlorate of potassium, seventy-five parts; nitronaphthalene, four-

teen parts; picrate of potassium, four parts; ricinic or castor oil, seven parts.

The process is carried out by first weighing seventy kilograms of the oil, to which is added thirty-two kilograms of picric acid. The mixture is then thoroughly stirred to render it homogeneous. Then eight kilograms of hydrate of potassium are added in the form of a solution at 45° Baumé, after which the mixture is again stirred to effect the combination, if necessary or desirable at a slight heat. It will be found that the reaction is terminated when the mixture shows an absolutely neutral reaction. This result being obtained, the nitronaphthalene is added, dissolving it in the oil by heating to about 80° or 90° centigrade, after which the powdered perchlorate is incorporated.

The following are some examples of powders in which chlorate of potash, perchlorate of ammonia, and nitrate of potash are employed:

Chlorate of potassium, eighty parts; nitronaphthalene, twelve parts; picrate of potassium, two parts; ricinic or castor oil, six parts.

Perchlorate of ammonium, eighty parts; nitronaphthalene, eleven parts; picrate of potassium, three parts; ricinic or castor oil, six parts.

Nitrite of potassium, seventy-nine parts; nitronaphthalene, eleven parts; picrate of potassium, four parts; ricinic or castor oil, six parts.

These mixtures of oil and picrate may be used either directly in a hot or cold state by adding to them simply chlorate or perchlorate or nitrate in a powdered state. A little wood-charcoal or starch-charcoal or fecula or farina may be added for the purpose of thickening the oil solution.

Chlorate of potassium, eighty parts; picrate of potassium, four parts; ricinic or castor oil, ten parts; wood-charcoal, six parts.

Perchlorate of potassium, seventy-five parts; picrate of potassium, five parts; ricinic or castor oil, nine parts; wood-charcoal, eleven parts.

Perchlorate of ammonium, eighty parts; picrate of potassium, four parts; oil, ten parts; charcoal, six parts.

Nitrate of potassium, seventy-eight parts;

picrate of potassium, five parts; oil, nine parts; wood-charcoal, eight parts.

Perchlorate of ammonium, forty-five parts; nitrite of potassium, thirty-five parts; picrate
5 of potassium, five parts; nitronaphthalene, nine parts; oil, six parts.

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

1. The process of making explosives, consisting in forming a picrate in a suitable oil
10 and adding a chlorate.

2. The process of making explosives consisting in forming a picrate in a suitable oil and adding another suitable nitrogen derivative
15 tive and a chlorate.

3. The process of making explosives consisting in forming picrate of potassium in a suitable oil and adding perchlorate of potassium.

4. The process of making explosives consisting in forming picrate of potassium in a suitable oil and adding nitronaphthalene and perchlorate of potassium.
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In testimony whereof I have signed my name to this specification in the presence of
25 two subscribing witnesses.

ADAM CHARLES GIRARD.

Witnesses:

EDWARD P. MACLEAN,
EMILE LEOBET.