

UNITED STATES PATENT OFFICE.

RAFAEL CALVET, OF BARCELONA, SPAIN.

MANUFACTURE OF PRIMARY EXPLOSIVES.

1,189,238.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, Dr. RAFAEL CALVET, a subject of the King of Spain, residing at No. 34 calle de Gerona, Barcelona, Spain, have invented certain new and useful Improvements in and Relating to the Manufacture of Primary Explosives, of which the following is a specification.

This invention relates to a primary explosive and its manufacture, the object being to produce a substance capable of replacing fulminate of mercury and the other usual detonating compounds.

The improved product consists of a mixture of a thiocyanate compound or of a substance derived therefrom with potassium chlorate or potassium perchlorate.

It has previously been proposed to utilize certain sulfocyanids or salts of the sulfocyanic acid SCNH , for the above said purpose. However these substances have not given complete satisfaction, because they are somewhat hygroscopic, highly unstable and impart these qualities to the explosives made with them. According to the present invention, compounds of sulfocyanogen which belong to a higher grade are employed and they constitute chemical compounds quite different from the sulfocyanates, these being called thiocyanate compounds. These compounds are neither hygroscopic nor unstable and when they are mixed with an oxidizing substance, specially with potassium chlorate or perchlorate, they produce primary explosives of great strength, which may be ignited by percussion or heat and might advantageously replace fulminate of mercury and similar preparations. These compounds indeed are not decomposed by moisture, nor do they form any reaction with the metal of the primers or caps; also they can withstand much higher temperatures than fulminate of mercury. These thiocyanate com-

pounds have an acid reaction and can consequently be combined with metals, and so form definite and permanent bodies which might, like the thiocyanate compounds from which they are derived, be used for the preparation of the improved primary explosive which forms the subject matter of the present patent application.

The compounds in question are the following: perthiocyanic acid or hydrogen perthiocyanate ($\text{S}_3\text{C}_2\text{N}_2\text{H}_2$) and its salts, particularly copper perthiocyanate ($\text{S}_3\text{C}_2\text{N}_2\text{Cu}$) and lead perthiocyanate ($\text{S}_3\text{C}_2\text{N}_2\text{Pb}$) further dithiocyanic acid or hydrogen dithiocyanate ($\text{S}_2\text{C}_2\text{N}_2\text{H}_2$) and its salts, copper dithiocyanate ($\text{S}_2\text{C}_2\text{N}_2\text{Cu}$) and dithiocyanate of lead ($\text{S}_2\text{C}_2\text{N}_2\text{Pb}$) and finally Wohler's thiocyanic compound ("pseudo sulphure de cyanogene" of Gerhardt and Laurent) ($\text{S}_3\text{C}_3\text{N}_3\text{H}$) as well as its combinations with copper ($\text{S}_3\text{C}_3\text{N}_3$)₂Cu and with lead ($\text{S}_3\text{C}_3\text{N}_3$)₂Pb.

I claim—

1. A primary explosive consisting of a mixture comprising a compound containing the radical $\text{S}_3\text{C}_2\text{N}_2$, and a salt containing chlorin and not less than three atoms of oxygen.

2. A primary explosive consisting of a mixture including $\text{S}_3\text{C}_2\text{N}_2\text{Cu}$, and an oxidizing salt of an acid containing chlorin.

3. A primary explosive containing $\text{S}_3\text{C}_2\text{N}_2\text{Cu}$ and potassium chlorate.

4. A primary explosive containing 1 part of a compound containing the radical $\text{S}_3\text{C}_2\text{N}_2$ and $2\frac{1}{2}$ to 3 parts of an oxidizing salt of an acid containing chlorin.

In testimony whereof I affix my signature in presence of two witnesses.

Dr. RAFAEL CALVET.

Witnesses:

CONSTANTINO LOPEZ y Cid,
NARCIS JUBERT.