

UNITED STATES PATENT OFFICE

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PERCUSSION CAP

No Drawing.

Application filed June 24, 1931. Serial No. 546,675.

This invention relates to improvements in charge for percussion caps.

Heretofore it has been suggested that diazodinitrophenol be used as an ingredient for charges for percussion caps in association with various ingredients of such charges as previously formed, as for example, in association with potassium chlorate or barium nitrate and antimony sulfide or ground glass.

The use of diazodinitrophenol as an ingredient for charges for percussion caps is of very definite advantage in that where diazodinitrophenol is used, mercury fulminate previously commonly used may be eliminated with elimination of the disadvantages of mercury fulminate arising from its extreme sensitivity to friction and its poisonous nature.

While the use of diazodinitrophenol in charges for percussion caps is of definite advantage, the charges produced are not in all respects entirely satisfactory in that with some smokeless powders such charges lack sufficient heat to properly ignite the powder, have a long ignition time and give lower breech pressures.

Now it is the object of this invention to provide a charge for percussion caps which will contain diazodinitrophenol and hence retain the advantages of the presence of diazodinitrophenol as an ingredient and, at the same time, which will contain an ingredient which will offset the indicated disadvantages of charges containing diazodinitrophenol.

The charge for percussion caps in accordance with this invention includes as ingredients diazodinitrophenol and a picrate of a phenylenediamine as, for example, paraphenylenediamine dipicrate and the picrates of ortho and meta phenylenediamine.

A picrate of a phenylenediamine, as for example, paraphenylenediamine dipicrate, may be produced by the method disclosed in the application for patent of Jean Piccard, Serial No. 510,772, filed January 23, 1931. Thus, for example, for the production of paraphenylenediamine dipicrate a boiling or nearly boiling solution of 8 grams of para-

phenylenediamine in 35 cc. of ethyl alcohol is mixed with a boiling or nearly boiling solution of 32 grams of picric acid in 320 cc. of ethyl alcohol. The picric acid and paraphenylenediamine react to form paraphenylenediamine dipicrate, which being only slightly soluble in the alcohol, may be readily separated therefrom by cooling and filtration.

The charge in accordance with this invention may and desirably will include in addition to diazodinitrophenol and a dipicrate of paraphenylenediamine, or a picrate of either of its isomers, the other ingredients usually included in percussion caps or smokeless powder primers, such for example, as an oxidizing salt as barium nitrate, potassium chlorate, etc., etc. or ground glass, antimony sulfide, etc., etc.

The charge in accordance with this invention may be combined in any desired manner, but is desirably combined by thoroughly incorporating the ingredients, with the exception of ground glass where used, together by grinding, as in a ball mill, under, for example, alcohol, then dried and reduced to a powder between paper, ground glass being finally added where ground glass is desired to be included.

The charge in accordance with this invention will be loaded into a cap or primer in any usual manner in desired quantity and compressed. If desired, the charge may be wet with collodion and pressed into a cake for loading or loaded and then pressed, being finally dried for use.

In accordance with this invention the charge may include diazodinitrophenol within about the range 5%-80% by weight and picrate as paraphenylenediamine dipicrate or a picrate of its isomers within the range 1%-40% by weight. Various other ingredients which, as has been indicated, may be included in the charge, may be in various amounts depending upon desired characteristics of the charge.

As illustrative of the practical adaptation of this invention a typical charge having desirable characteristics and giving desired re-

sults may be in accordance with the following formula:

	Grams
Diazodinitrophenol.....	0.450
Paraphenylenediamine dipicrate.....	0.150
Barium nitrate.....	0.200
Ground glass.....	0.200

The ingredients of the above formula may be blended together in a dry state and loaded in any suitable manner, or if desired, the ingredients with the exception of ground glass may be ground together in a ball mill under alcohol, dried and reduced to powder between paper, the ground glass being added to the powder. The composition may be loaded in any suitable manner, as after wetting with collodion.

It will be understood that from the broad standpoint this invention involves the use of diazodinitrophenol and a picrate of a phenylenediamine, as paraphenylenediamines, or a dipicrate of either of its isomers, as ingredients of a charge for percussion caps with or without the addition of other ingredients such as are usually used in percussion caps. It will be understood that the amounts of diazodinitrophenol and of picrate may be widely varied and that their use in any suitable proportions is contemplated as within the scope of this invention. Likewise, the amount of the composition in accordance with this invention which may be charged into a percussion cap may be varied to meet the varied requirements of the cap.

It will be understood that where in the claims appended hereto the term paraphenylenediamine dipicrate is used, I intend such term to cover and include ortho-phenylenediamine picrate and meta-phenylenediamine picrate.

What I claim and desire to protect by Letters Patent is:

1. A charge for percussion caps including as ingredients diazodinitrophenol and a picrate of a paraphenylenediamine.

2. A charge for percussion caps including as ingredients diazodinitrophenol and paraphenylenediamine dipicrate.

3. A charge for percussion caps including as ingredients diazodinitrophenol, paraphenylenediamine dipicrate and an oxidizing salt.

4. A charge for percussion caps including as ingredients diazodinitrophenol, paraphenylenediamine dipicrate, an oxidizing salt and ground glass.

5. A charge for percussion caps including as ingredients diazodinitrophenol, paraphenylenediamine dipicrate, barium nitrate and ground glass.

6. A charge for percussion caps including as ingredients diazodinitrophenol 5%-80% by weight and paraphenylenediamine dipicrate 1%-40% by weight.

7. A charge for percussion caps including

as ingredients diazodinitrophenol about 45% by weight and paraphenylenediamine dipicrate about 15% by weight.

8. A charge for percussion caps including as ingredients diazodinitrophenol about 45% by weight, paraphenylenediamine dipicrate about 15% by weight and about equal percentages by weight of barium nitrate and ground glass.

In testimony of which invention, I have hereunto set my hand, at Wilmington, Delaware, on this 18th day of June, 1931.

HARRY E. KAISER.