

## UNITED STATES PATENT OFFICE

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DETONATOR, FOR EXAMPLE, BLASTING  
DETONATOR

Leon Rubenstein, Saltcoats, Scotland, assignor  
to Imperial Chemical Industries Limited, a cor-  
poration of Great Britain

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This invention relates to detonators and more particularly to charges therefor.

This invention has as an object to devise a new and improved charge for detonators. A further object is to devise a charge which will be particularly valuable as a base charge in a detonator of the type described above. Further objects will appear hereafter.

These objects are accomplished by the following invention. I have found that I can use as a base charge guanyl azide picrate (diazoguanidine picrate), with or without admixture of other suitable base charge ingredients, for example tetryl. The detonator shell may be formed from copper, aluminum or any suitable copper or aluminum alloy. Guanyl azide picrate has a sufficiently high brisance to enable it to be used for modern blasting practice and it is not so easily ignited by shock or friction as substances such as mercury fulminate or lead azide. The invention further includes a charge for a detonator comprising a primary initiating composition, e. g., a mixture of lead azide and lead styphnate, and a base charge comprising guanyl azide picrate.

Guanyl azide picrate possesses excellent storage properties and has the property of running freely, which facilitates the loading of the detonator. It can also be corned or granulated in the usual fashion. It binds together satisfactorily under the pressures which are normally employed in loading detonators.

The following examples illustrate but do not limit the invention.

*Example 1*

25 centigrams of guanyl azide picrate are pressed at 162 lb. per sq. inch into an aluminum detonator tube of 6 mm. diameter and 35 mm. length. 35 centigrams of a mixture of 30 parts by weight of lead styphnate and 70 parts by weight of lead azide are then pressed into the detonator above the picrate base charge at the same pressure. An electric fuse containing a fusehead primed with lead mononitroresorcinat is inserted and crimped into position in the detonator. On testing this electric detonator on a lead plate of 4 mm. thickness, such as is used for testing detonators, a deep indentation and perforation of the plate is produced when the detonator is fired, the fusehead being ignited by a current of 0.5 amp. passed through it for not over 0.05 sec. by means of suitable connecting wires.

*Example 2*

25 centigrams of guanyl azide picrate are pressed at 176 lb. per sq. inch into a copper deto-

nator tube of 6 mm. diameter and 35 mm. length. This base charge is followed by a priming charge of 40 centigrams of a mixture consisting of 90 parts by weight of mercury fulminate and 10 parts by weight of potassium chlorate. A perforated copper cap 8 mm. in length is inserted and pressed into position under a load of 176 lb. per sq. inch. A length of fuse is crimped into the detonator. When placed on a lead plate of 4 mm. thickness, and fired by means of the fuse, the detonator produces an indentation in the lead plate similar to that formed when a base charge of tetryl is employed instead of guanyl azide picrate.

This invention is a valuable contribution to the art as guanyl azide picrate combines both the high brisance necessary for use in a detonator with its property of not being easily ignited by shock or friction, its excellent storage and free running properties make it peculiarly suitable for detonators as does its property of binding under pressure.

It is to be understood that I do not limit myself to a detonator in which there is both a primary and a secondary charge. I prefer to use a primary charge when making a detonator with guanyl azide picrate but I claim the use of it in detonators whether a primary charge is used or not.

Thus the preferred form of my detonator comprises an initiator such as an electric fusehead or a deflagrating charge comprising lead mononitroresorcinat, copper acetylide or basic lead dinitrocresylate (U. K. Appn. 7403/36) or lead picrate or a lead thiocyanate-chlorate mixture and a primary charge comprising mercury fulminate or lead azide or lead azide/lead styphnate mixtures and a base charge of guanyl azide picrate with or without other suitable base charge ingredients.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments thereof except as defined in the appended claims.

I claim:

1. A blasting cap wherein the base charge comprises guanyl azide picrate.

2. A blasting cap comprising a metal container, a primary charge, and a base charge comprising guanyl azide picrate.

3. The blasting cap according to claim 2 wherein the container is of copper and the primary charge comprises mercury fulminate and potassium chlorate.

4. An electric blasting cap comprising a metal container, an ignition charge, a primary charge, and a base charge which comprises guanyl azide picrate.
- 5 5. The electric blasting cap according to claim 4 wherein the container is of aluminum and the primary charge comprises lead azide and lead styphnate.
6. The electric blasting cap according to claim 4 wherein the ignition composition comprises lead mononitro-resorcinate.
7. A blasting cap comprising an initiator, a primary charge and a base charge which comprises guanyl azide picrate. 5

LEON RUBENSTEIN.