Aug. 31, 1954 U. GÜNTHER 2,687,667

PRIMER FOR IGNITING EXPLOSIVES

Filed Aug. 31, 1951

Fig. 1

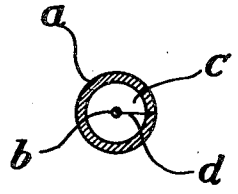


Fig. 2

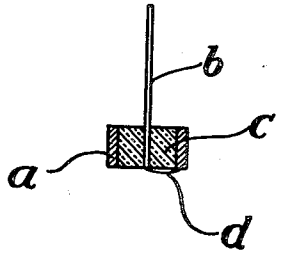


Fig. 3

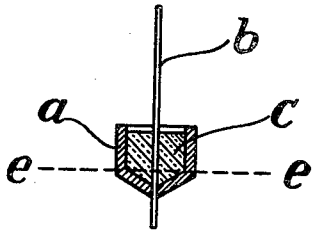
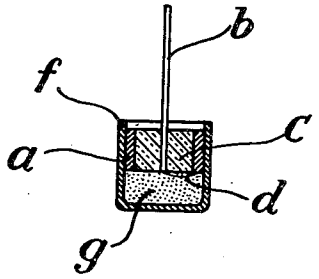


Fig. 4



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PRIMER FOR IGNITING EXPLOSIVES

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2 Claims. (Cl. 86—1)

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This invention relates to primers for igniting explosives and to a method of manufacturing the same.

More particularly, the invention relates to electric primers.

As known in the art, it is customary to use either mechanical primers or electrical firing means, such as spark primers or bridge primers, comprising an incandescent wire.

The last mentioned type of primers comprises a pole-supporting body with a thin firing wire connected to two lead-in wires, and a priming charge of explosives which is ignited and detonated by the incandescence of the wire. Such an electric primer is, as a rule, made by fastening a piece of thin wire under tension over the edge of a small plate of insulating material, which is lined with metal foil, to which the wire is attached. The edge over which the wire is passed is repeatedly dipped into a paste made of primer explosive and a binder and thereafter the plate is embedded in a protective casing made of insulating material.

It is a disadvantage of devices of this kind that the explosive is mixed with a binder whereby it is slowed up in its activity; the firing wire too has to be coated with a layer of binder and this retards the heat exchange between the firing wire and the explosive, and in turn the ignition of the latter. Furthermore, the whole set-up of this primer is not sturdy enough and therefore not suitable for use with artillery ammunition which has very high acceleration pressures. The primer is, moreover, not sufficiently resistant against temperature changes and humidity over a prolonged period of storage.

It is the object of the present invention to provide a primer which is free of the above mentioned drawbacks and very effective after any required period of storage.

It is another object of the present invention to provide a primer of sturdy construction which is well suitable to be used with modern ammunition.

Other objects and advantages of the present invention will become apparent from the following specification.

According to the invention, the firing wire is pressed into a support case of great strength and such conformation that it will withstand the high pressures used in lodging the wire in said support. Depending on the nature of the primer explosive, pressures from 100 to 1200 atmospheres are used in pressing the explosive, which is unadulterated and free from any binder, into said

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supporting case. The structure so obtained will withstand even the highest acceleration pressures and is quite unaffected by atmospheric conditions over any required period.

The pole-supporting body of the primer according to the invention comprises a metal shell or a perforated cup in which an inner pole, consisting for instance of wire, is embedded by means of an insulating material, such as enamel. The insulating surface separating the pole from the metal shell is smoothly polished or filled and upon this surface the thin firing wire is disposed with one end connected to the shell and the other to the inner pole.

According to a modified embodiment of the invention, no connecting wire has to be used, the primer working on the spark principle.

In the accompanying drawing the invention is illustrated by way of example.

Fig. 1 shows a construction of the pole-supporting body in plan;

Fig. 2 is a sectional view of the same;

Fig. 3 illustrates the method of assembling the pole-supporting body, and

Fig. 4 shows the primer as finished article.

Referring to the drawing, *a* designates the outer metal shell, *b* is the inner pole, *c* the insulating material rigidly connecting the inner pole and the outer shell, and *d* the thin wire connecting the shell and the inner pole.

For making a pole-supporting body of this type, the following method may be used as illustrated in Fig. 3. The outer shell *a* has in the beginning the form of a small cup with a conical bottom. This bottom has a central bore through which a conductor, such as a wire, forming the inner pole *b*, is passed whereupon the interior of the cup is filled with a liquid insulating mass that will solidify later on. This mass may, for instance, be enamel powder which is fused by a flame while being poured in. After the mass has become solid, the pointed bottom of the cup is ground or filed off along the line *e—e* and the firing wire is fastened on top so that a body as shown in Fig. 2 results.

There will be a gap between the wire *b* and the shell *a* depending in length on how much of the pointed bottom is ground or filed off. The gap may be so small that it may correspond in size to one as it is used in spark primers and this makes a new method of large-scale manufacture possible, hitherto unknown for this article. The finished primer is shown in Fig. 4 in which *f* is an outer cup and *g* the primer explosive. For making the article, the pole-supporting body, as

shown in Fig. 2, is pressed into cup *f*, which contains the primer explosive, under high compression so as to be received with a snug fit.

For ignition, current flows over the outer pole *f* and the inner pole *b*. In some cases it is desirable to connect a second wire with the shell *a* for lead-in purposes.

While I have described and illustrated an example of the novel primer according to the invention and a method of making the same, it should be understood that many modifications can be made in the structure of the primer and in the method of making it without departing from the spirit of the invention.

What I claim is:

1. In a method for making an electric primer for igniting explosives, which primer has an outer case partly filled with a priming charge of an explosive and an inner pole-supporting body, the steps which comprise mounting in a metal shell, having a cone-shaped bottom with a bore therein, an inner pole by pulling an electric wire through said bore, embedding said inner pole in a liquefied mass of insulating material, allowing the latter to solidify, and cutting off said cone-shaped bottom at a level depending on the desired length of the gap formed between the inner pole and the shell.

2. A method according to claim 1, wherein after removal of the bottom the inner pole is connected by a wire to said metal shell.

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