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L. E. RÉMONDY

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COMBINED DETONATOR AND FUSE BODY FOR PERCUSSION OR OTHER FUSES

Filed Feb. 5, 1927

Fig. 1.

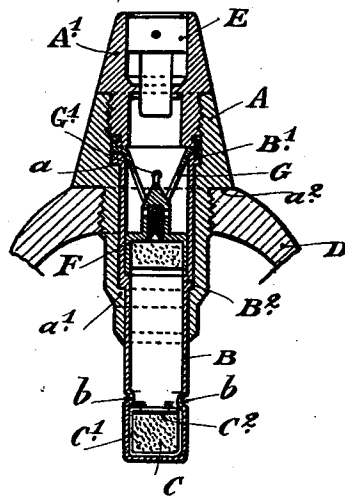


Fig. 2.

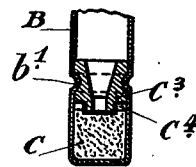


Fig. 3.

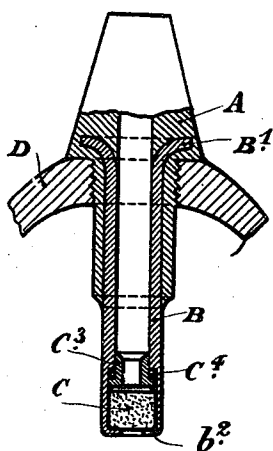
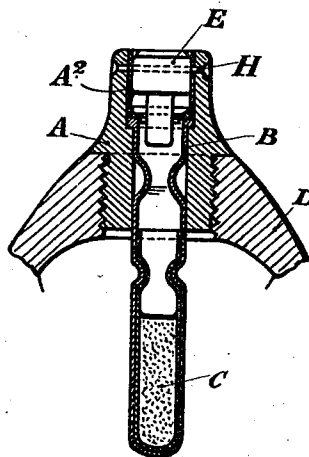


Fig. 4.



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COMBINED DETONATOR AND FUSE BODY FOR PERCUSSION OR OTHER FUSES.

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It is known that projectile fuses and more particularly percussion fuses comprise a firing mechanism by means of which a percussion cap is fired when the operation of the fuse takes place. The flash from this percussion cap is made to send-off the explosive charge of the projectile only through a detonating relay. This relay is more generally formed by a socket or gaine at the inner end of which is lodged a detonating primer. The detonator arrangement (gaine and primer) thus formed, constitutes a separate element which is adapted upon the fuse body by screwing or any other suitable means.

The present invention has for its subject a fuse body and detonator combined in such a way that the detonator, or more exactly the socket in which the detonator charge is lodged, forms in its entirety or in part an internal lining for the fuse body, which lining, by means of one or more splayed or expanded portions, is hooked on corresponding shoulders on the enclosing body, one of these expanded portions at least being hooked or seated directly upon the part of the fuse body which itself is seated on the projectile. In practice, a detonator socket according to the invention will be constructed so as to provide, in its upper part, a lodgment for a removable delay holder.

In the case when this combined fuse body and detonator is employed with a super-sensitive fuse which operates instantaneously and before any crushing of the fuse body takes place, this fuse body may be made of a relatively weak material such as aluminium or an aluminium alloy, a plastic material, etc.—the lining sleeve which carries the detonator alone being made of a strong material such as steel or steel cased with copper for example. In this case, more particularly, the arrangement formed by the fuse and the detonator could be constructed much more easily and more economically than heretofore, an economy being effected both in machining and in mounting.

Various examples of construction of the invention are shown in the accompanying drawing, in which:—

Figure 1 is a longitudinal sectional elevation of a general arrangement of a fuse according to the invention, constructed with a view to the use in combination with super sensitive percussion fuse operating by driv-

ing in and inertia and in conformity to the U. S. Patents Nos. 1,459,075 and 1,562,054.

Fig. 2 shows means for securing a detonator in the socket member.

Fig. 3 illustrates another manner of securing the socket member in the fuse.

Fig. 4 is a longitudinal section of another form of fuse embodying the invention.

In this figure, A is a fuse body proper formed for example by casting, from a material such as aluminium, B is a detonator socket or gaine, that is to say a socket at the bottom of which is lodged and held a detonating primer C. The detonating charge C may, in the known manner, be contained in a capsule C¹ (as shown in Fig. 1) closed by a diaphragm C², the arrangement C—C² keeping the primer perfectly fluid tight; any displacement of the said capsule is prevented by indenting the socket with a punch as at b. As seen from the modification shown in Figure 2, the detonating composition C may be lodged directly at the bottom of the socket B, and retained by a perforated piece C³ made of a light metal, forming a wad and retained by suitable crimping.

As shown in the drawing the gaine or socket B forms in part an internal lining for the fuse body A. This gaine may be made of a strong material such as steel or steel cased with copper.

The body A and the socket B are so shaped that the latter is hooked by means of one or more expanded portions B¹, B² upon corresponding shoulders a, a¹ on the enclosing fuse body A. One of these expanded portions a at least is seated directly upon the part of the fuse body which is itself seated at a², upon the projectile D. The socket B which lines the fuse body internally, may be held in place by an independent part A¹ of the fuse body which part is screwed on A and serves as lodgment for the mechanism E. The lining socket B may, as shown in Figure 1, serve as lodgment, by means of its front part, for a removable delay device F which will bear upon the lower expanded portion B² and may itself be held in place by a hollow conical and slightly elastic member G gripped by its front base between the securing shoulder B¹ of the socket and the part A¹ of the fuse body containing the mechanism.

The elasticity may be obtained by means of a series of slots G¹ forming at the same time ducts allowing the gases to pass to-

wards the delay holder and the gases coming from the latter to pass. The member G may as shown in the drawing, be attached onto the part A' of the fuse body for instance by setting.

As will be seen the invention not only makes it possible to obtain an economical construction from the point of view of raw material employed for the arrangement formed by the main part A of the fuse body and the socket B, the latter only needing to be made of a strong material in order to prevent any fracture due to the effect of inertia when the shot is fired; but, in addition, on account of the simple and direct sleeve fit between the detonator carrying socket and the fuse body, all machining for fixing the detonator in place is avoided.

Figure 3 shows, in sectional elevation, a constructional example of the combined fuse body and detonator in which the upper splayed part of shoulder B¹, of the socket B is embedded, during manufacture, in the softer material of the fuse body A.

It goes without saying that it is possible, instead of embedding the shoulder B¹ in the softer material, to embed the whole of the front part therein the flash transmitting duct being formed in the fuse body A. The lower projecting part of the socket receiving the detonating primer C may, as shown in Figure 3, comprise a chamber forming a lodgment for the detonating primer C which will be held in place, for example, by means of a tube C³, forming a wad, between an elastic bearing washer C⁴ made of felt or other suitable material and a setting b², formed at the bottom part of the socket. In this case the socket carrying the detonating primer may be formed directly by a frame lodged in the fuse body of weaker material in accordance with the invention forming the subject of the U. S. Patent No. 1,540,283.

Naturally, the outlines, internal and external, of the gaine or socket B which contains the detonating primer, may be varied as desired to suit the mode of construction of the elements of the fuse, according as to whether the said fuse is intended to be employed with a removable or a fixed delay device or in combination with firing meech-

anisms other than the one shown by way of example in the drawing.

In the modification shown in sectional elevation in Figure 4, the gaine B instead of being, as shown in Figure 1, secured in place by a part A¹ of the fuse body screwed upon the part A, is held in place by a socket A² fitted into A and secured upon the fuse body by a pin H which itself serves for securing in place the carriage E containing the firing mechanism.

Further in this modification the conical narrowed portion which, in the example shown in Figure 1, was formed by the member G, is formed by the body of the gaine B which is pressed in after the primer C has been introduced.

I claim:

1. In a fuse, a body having a bore therein and a shoulder in said bore, a socket member supported on said shoulder and lining said bore, detonating means in said socket member, a shoulder in said socket member, a delay mechanism having a portion engaging said last named shoulder, and means operatively engaging said shoulder in said bore and said delay mechanism whereby said delay mechanism is supported in said socket member between said shoulders.

2. In a fuse, a body having a bore therein and a shoulder in said bore, a socket member supported from said shoulder, detonating means in said socket member, a shoulder in said socket member, delay mechanism resting against said last named shoulder, and resilient means interposed between said delay mechanism and said first named shoulder.

3. In a fuse, a body having a bore therein and a shoulder in said bore, a socket member supported from said shoulder, detonating means in said socket member, a shoulder in said socket member, delay mechanism resting against said last named shoulder, and a slotted conical member interposed between said delay mechanism and said first named shoulder.

In testimony whereof I have signed this specification.

LÉON EMILE RÉMONDY.