

Feb. 12, 1929.

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1,702,133

SUPERSENSITIVE FUSE FOR PROJECTILES OF ALL CALIBERS

Filed Feb. 5, 1927

2 Sheets-Sheet 1

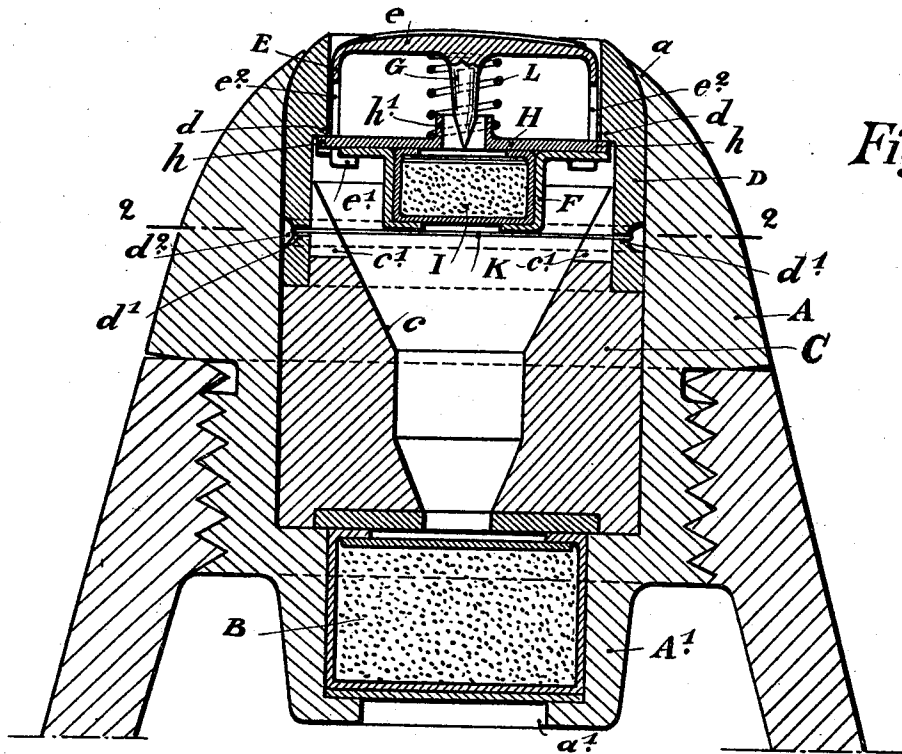


Fig. 1.

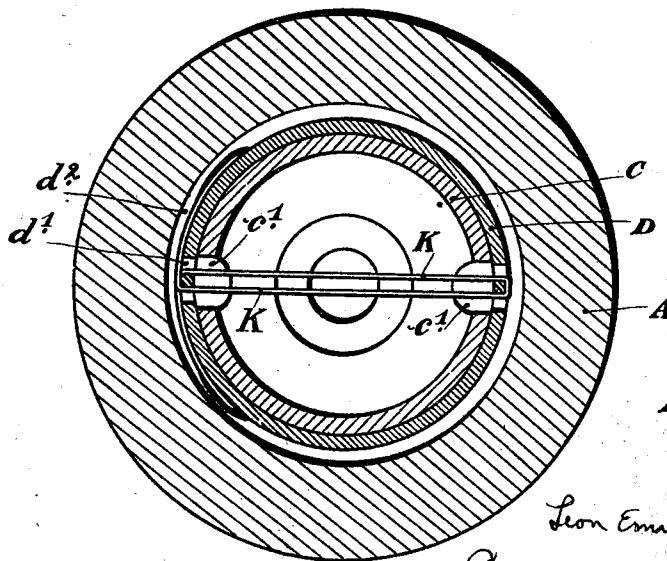


Fig. 2

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Fig. 3.

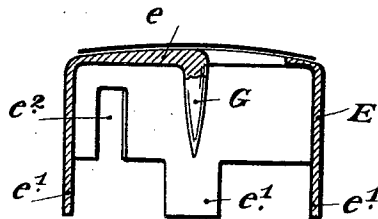


Fig. 5.

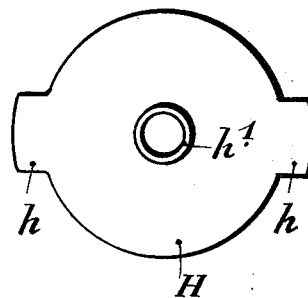


Fig. 4.

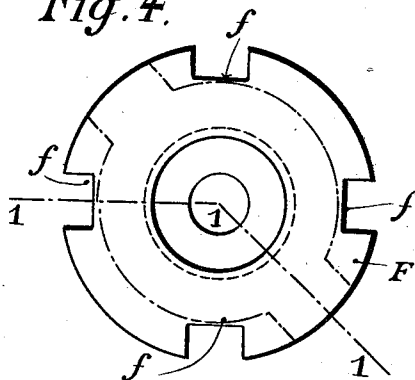
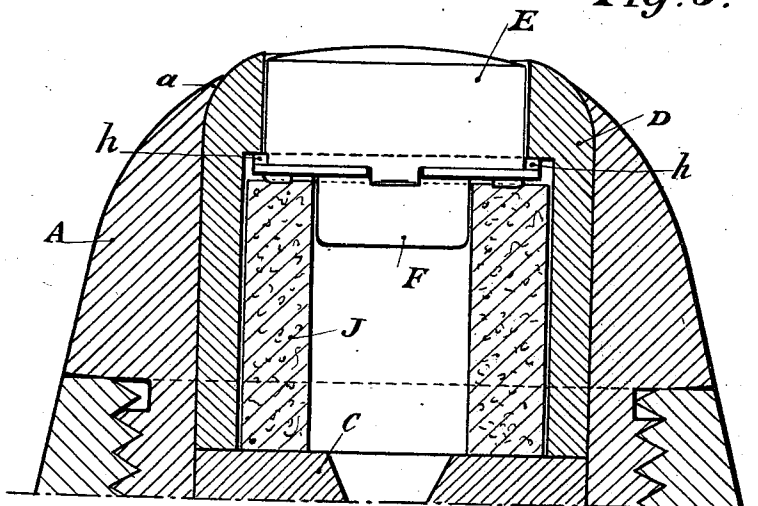


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SUPERSENSITIVE FUSE FOR PROJECTILES OF ALL CALIBERS.

Application filed February 5, 1927, Serial No. 166,235, and in Brazil April 26, 1926.

The present invention has for its subject a super sensitive fuse for projectile of all calibers.

The fuse is illustrated in detail to a very much enlarged scale in the accompanying drawing in which:

Figure 1 is a longitudinal sectional elevation of a general arrangement of the fuse mounted in place upon the projectile, this section being taken along the line 1—1 in Figure 4.

Figure 2 is a sectional elevation in detail, taken along the line 2—2 in Figure 1, of the upper element of the casing of the firing mechanism, this element being shown in longitudinal sectional elevation in Figure 3 before its assembly by being hooked on to the lower element.

Figure 4 is a plan view from above of the lower element of the casing of the mechanism, which element contains the percussion cap.

Figure 5 is a plan view of the safety disc which, in Figure 4, is assumed to be removed and is shown in dot and dash lines.

Figure 6 is a longitudinal sectional view of a modification.

According to the invention, the fuse comprises a fuse body A—A¹ the lower part A¹ of which is shaped so as to serve as a cup for the lodgment of a charge B which forms a detonator, an orifice a¹ being formed at the end of this lodgment cup for the passage of the flash from the detonator to the charge of the projectile.

Above the cup A¹, in the part A of the fuse body integral with this cup, is disposed a sleeve C through which is pierced an axial duct the upper frusto conical part c of which has a function which will be indicated hereinafter and which also forms a lodgment, guide and displacement chamber for the percussion system, in other words, for the casing containing the firing mechanism.

This casing is formed by means of two stampings E, F made of a light metal such as aluminium or an alloy such as alferium. The upper element E is formed by a socket the end e of which is domed externally, as shown in Figs. 1 and 3, and in the centre of the end e is

formed by punching a striker G. Projecting upon the front edge of the stamping E—G are formed lugs e¹. In the longitudinal wall are formed two slots e² forming slideways for the projecting wings h of a safety disc H, in a central tubular projection h¹ of which the point of the striker G engages when the mechanism is placed in position.

The lower element F of the casing E—F is shaped into a cup in such a way as to serve as a lodgment for the percussion cap I; the two elements E, F are assembled together, after the percussion cap has been placed in position and the safety disc H engaged, with, if desired a spring L, by bending over the lugs e¹ engaging in the slots f formed upon the flange of the element F, the said lugs thus bearing beneath the said upper flange of the cup F.

The element E is guided in the mouth of a retaining sleeve D bearing upon the sleeve C. The mechanism is prevented from escaping outwards by the wings or lugs h of the disc H and the flange of the disc of the element F abutting beneath a shoulder d formed upon the sleeve D. Normally, any re-entry of the sleeve of the movable carriage E—F which contains the mechanism is prevented by the element F bearing upon one or more wires K stretched under suitable tension through slots c¹ in the sleeve C. The wires K may, as shown in Figs. 1 and 2, engage in holes d¹ formed in the sleeve D at the bottom of a groove d², the ends of these wires being secured to the wall of the groove for example by soldering or welding, or by any other suitable means.

Once the movable carriage has been placed in position in the sleeve D, this sleeve is engaged in the fuse body A which comprises, upon its outer edge a thin lip a which is crimped over the said sleeve D.

The supporting wires K may, as shown in the modification according to Fig. 6, be replaced by a cork sleeve J; instead of cork use may be made of any other compressible material such as felt for example.

In the event of a fall from a small height during handling and transport, the velocity acquired by the projectile at the moment it strikes an obstacle (the ground, the deck of a

vessel, floor or other such surface) will certainly cause the plastic material J to be crushed, or the retaining wire K to yield or be broken, and consequently the carriage E—F to be driven into the duct c; but the kinetic energy ($1/2mV^2$) of the percussion cap will then be too small on account of the very small value of m and V , for the impact between the percussion cap and striker to produce ignition.

The wires K or the plastic material J are, moreover, sufficient to prevent any recoil of the carriage into the fuse body when the shot is fired since the arrangement formed by the casing E—F and the mechanism it contains is extraordinarily light, its weight being in the order of 2 to 3 decigrams.

On the other hand, if the impact is produced against an obstacle, even one offering very little resistance (the wing fabric of an aeroplane, the fabric of a balloon, very soft soil, etc.) when the velocity V of the projectile and of the percussion cap has a suitable value, such as that which it reaches during firing, the wire K is broken or made to yield or the plastic material J is crushed at the same time as the impact between the percussion cap and the striker, the point of which is guided, takes place with sufficient violence for the percussion cap to be fired.

It is possible, without very greatly increasing the weight of the movable carriage, to dispose, as mentioned above, in the interior of the casing, between the end of the element E and the disc H, a spring L.

The function of the coned portion at the mouth of the sleeve C is to exert a braking action on the impact between the movable carriage E—F and the fuse body, in the event of the untimely rupture of the supporting wire K when the shot is fired.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a fuse for projectiles, primer and striker mechanism comprising two oppositely disposed hollow cup-shaped members, one of said members having a notched flange and the other having projections engaging the notches to hook said members together to constitute a hollow body, a primer carried in one end of said body, a striker carried in the other end of said body, one of said members having slotted walls, and a disk member in said last named member having wings engaging the slots in said walls.

2. In a fuse for projectiles, a fuse body, primer and striker mechanism mounted therein comprising a hollow, substantially cylindrical body formed by two oppositely disposed hollow cup-shaped members joined together at their rims to constitute a hollow body, a primer carried in one end of said body, a striker carried in the other end of

said body, and means normally restraining movement of said hollow body in said fuse body.

3. In a fuse for projectiles, primer and striker mechanism comprising two oppositely disposed hollow cup-shaped members, one of said members having a notched flange and the other having projections engaging the notches to join said members together to form a hollow body, a part of one of said members being bent internally thereof to constitute a strike, a primer slidably mounted in the other of said members, and resilient means interposed between said primer and striker.

4. In a fuse for projectiles, a fuse body having an interior shoulder, a cup-shaped member adapted to slide in said fuse body and having a plurality of projections formed on the edge of the cup, a second cup-shaped member having a peripheral flange notched to receive said projections, said members constituting a carriage for primer and striker, said flange engaging said shoulder to prevent forward movement of said carriage in said fuse body, and means normally restraining said carriage against rearward movement in said fuse body.

5. In a fuse for projectiles, a fuse body having an interior shoulder, a cup-shaped member adapted to slide in said fuse body and having a plurality of projections formed on the edge of the cup, a second cup-shaped member having a peripheral flange notched to receive said projections, said members constituting a carriage for primer and striker, said first named member having slots in the sides thereof, a disk member slidable in said first named member and having wings engaging said slots, said wings and said flange engaging said shoulder to prevent forward movement of said carriage in said fuse body, and means normally restraining said carriage against rearward movement in said fuse body.

6. In a fuse for projectiles, a hollow fuse body cup-shaped at one end to receive a detonator, a sleeve in said body above the detonator, primer and striker mechanism slidable in said sleeve, said mechanism including a two-part hollow body, a primer and striker therein, and resilient means separating said primer and striker, and means secured to said sleeve to normally prevent the rearward displacement of said body in said sleeve.

7. In a fuse for projectiles, a hollow fuse body cup-shaped at one end to receive a detonator, a sleeve in said body above the detonator, primer and striker mechanism slidable in said sleeve, said mechanism including a two-part hollow body, slots in the sides of said body, a member slidable therein having wings engaging said slots, a primer and striker in said body on either side of said member, and resilient means interposed be-

tween said member and said primer, and a sleeve and passing therethrough under said wire secured to said sleeve and passing there- mechanism, said mechanism resting on said through under said hollow body. means whereby displacement thereof is nor- 10

mally prevented.

In testimony whereof I have signed this specification.

LÉON EMILE RÉMONDY.

5 8. In a fuse for projectiles, the combina-
tion of a sleeve, primer and striker mech-
anism adapted for longitudinal movement
therein, and frangible means secured to said