

(No Model.)

W. B. FELTS.  
PERCUSSION FUSE.

No. 561,506.

Patented June 2, 1896.

FIG. 1.

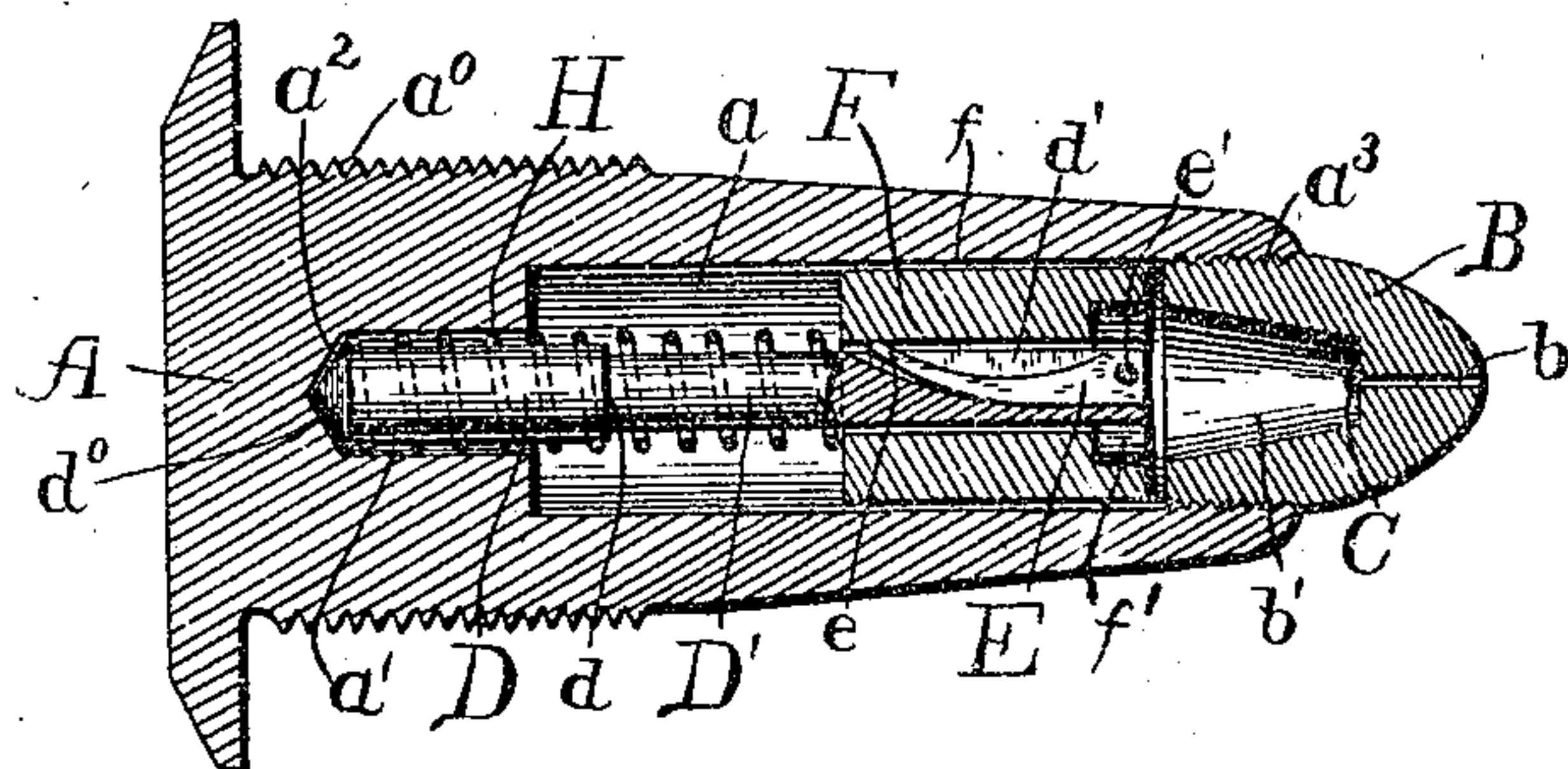


FIG. 2.

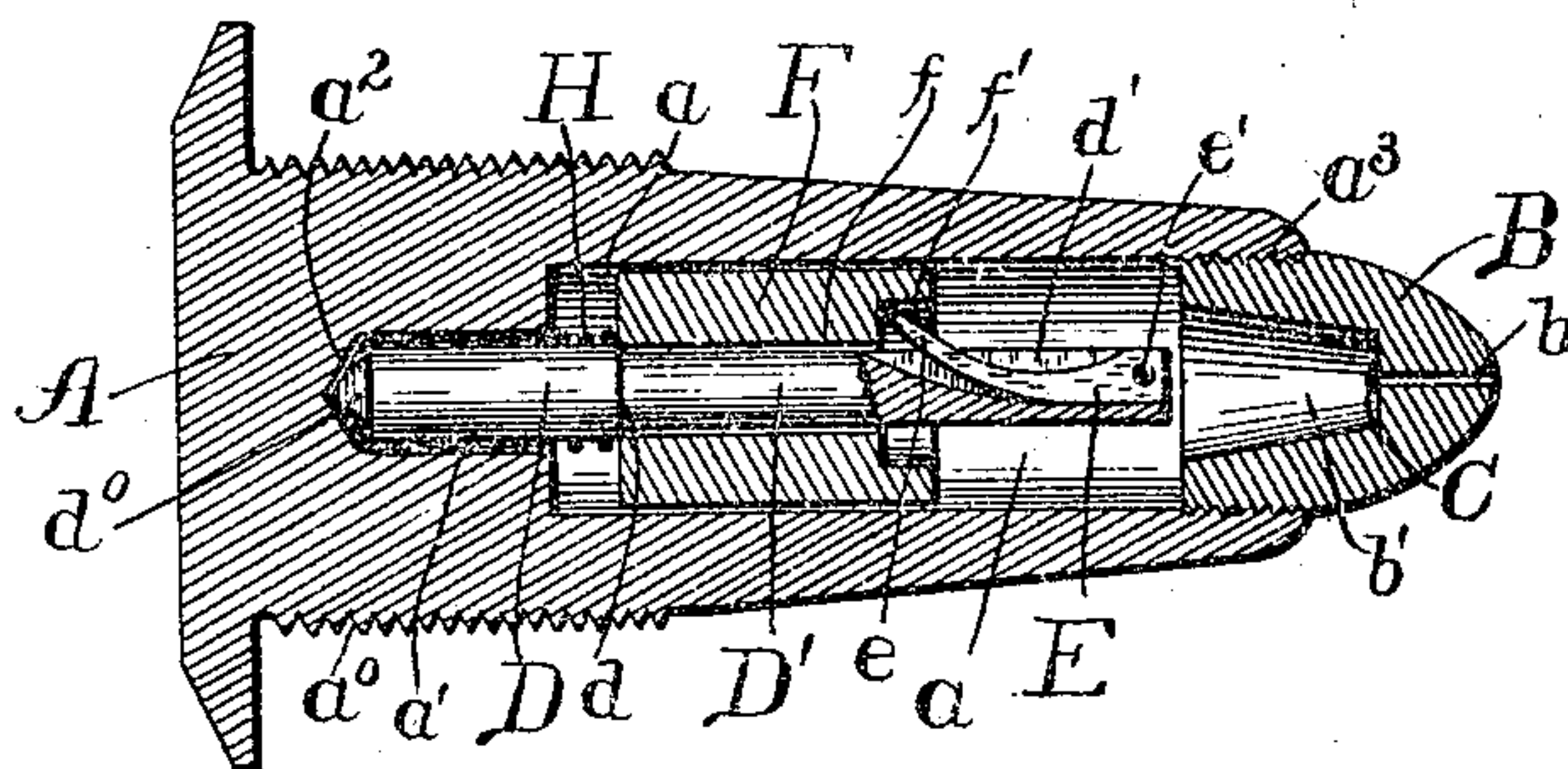
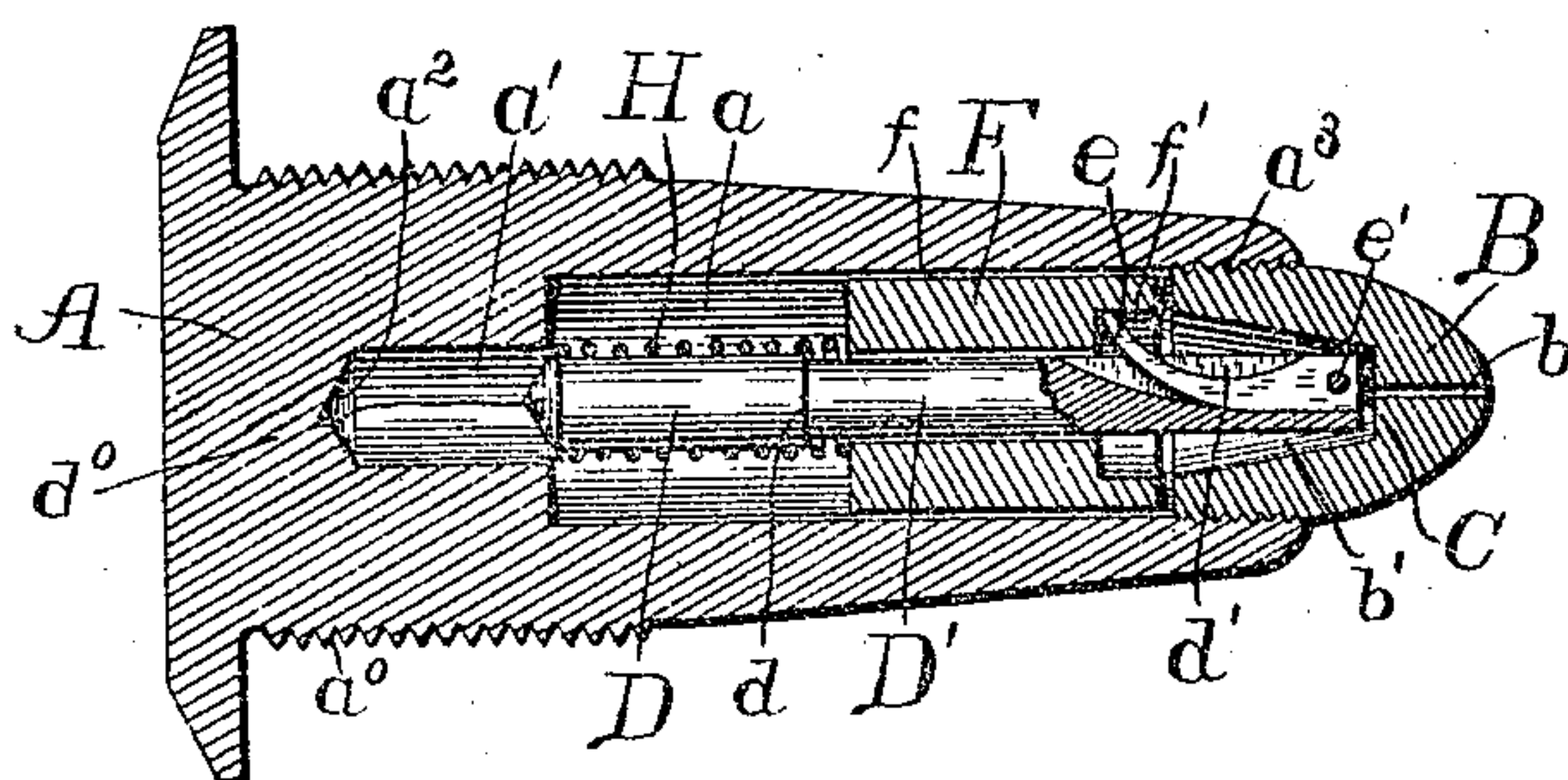


FIG. 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM B. FELTS, OF THE UNITED STATES ARMY, ASSIGNOR OF ONE-HALF  
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## PERCUSSION-FUSE.

SPECIFICATION forming part of Letters Patent No. 561,506, dated June 2, 1896.

Application filed September 28, 1895. Serial No. 564,052. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM B. FELTS, a citizen of the United States, now serving as a private in Company A of the Tenth United States Infantry, stationed at Fort Reno, Oklahoma Territory, have invented a new and useful Percussion-Fuse, of which the following is a specification.

My invention relates to improvements in percussion-fuses for use in shell; and the said invention consists of certain novel features hereinafter described and claimed.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a central longitudinal section through the fuse, showing the operating parts in their normal position, or that in which they ordinarily remain prior to firing the projectile. Fig. 2 represents a similar section to that shown in Fig. 1 and illustrates the position of the parts after the gun has been fired, but before the projectile strikes the target. Fig. 3 represents a similar section to that shown in Figs. 1 and 2 with the operative parts in the position they assume when the projectile strikes the target and when the fuse acts.

A represents the fuse-stock, which is externally of the ordinary shape and is screw-threaded, as at  $a'$ , and screwed into the fuse-hole or bouching in the shell. This fuse-stock is provided with a cylindrical chamber  $a$ , which opens into a smaller cylindrical chamber  $a'$ , the latter preferably provided with a conical base  $a^2$ . Near the forward end of the chamber  $a$  screw-threads  $a^3$  are provided, in which the plug or anvil B screws. This plug is provided with a small opening  $b$ , above which the detonating composition C is placed. The interior of this plug or anvil B is hollowed out, as at  $b'$ , to receive the point of the plunger D. This plunger D is reduced along its forward portion, as at  $D'$ , and is provided with a rounded shoulder  $d$  near the base thereof and with a flanged cap  $d'$ , made conical to fit the chamber  $a^2$  and passing freely into the chamber  $a'$ . The forward end of this plunger is chambered, as at  $d''$ , to re-

ceive the extensible spring E, which is secured at its fixed end in said plunger, as at  $e'$ , while its free end normally tends to spring outward away from the axis of the said plunger.

A coil-spring H is slipped over the plunger D and is held between flanged cap  $d$  and the sleeve F, which sleeve is slipped over the forward end of the plunger and normally holds the spring E inclosed within the chamber  $d$ , as shown in Fig. 1. The said sleeve is provided with an annular chamber  $f'$  at the forward end thereof, adapted to allow the point  $e$  of the spring E to fly outward when the sleeve F is forced to the rear, as would be the case when the gun is fired, as shown in Fig. 2. This sleeve F should be made of brass or other heavy metal, and it has a double function of locking the fuse in the safety position before the gun is fired and of adding its inertia to that of the plunger when the projectile strikes the cap or detonator or fulminate. This sleeve is normally held between the end of the spring H and the shoulder at the base of the plug or anvil B, as shown in Fig. 1. Now when the gun is fired the fuse-stock and plunger D move forward with the shell; but the inertia of the sleeve F causes the latter to apparently move over the reduced portion  $D'$  of the plunger, compressing the spring H until the rear end of the sleeve strikes the rounded shoulder  $d$  on the plunger, at which time the relative motion of the sleeve as regards the plunger is stopped, while the end  $e$  of the spring E flies outward, engaging in the chamber  $f'$ , as shown in Fig. 2. The spring H being now compressed between the cap  $d'$  and the rear face of the sleeve F, which sleeve is now prevented, by means of the spring E, from moving forward again on the plunger, there is no tendency of the said spring to move in either direction, and the plunger carrying the sleeve will remain in the position indicated in Fig. 2 until the shell strikes the object. Then the motion of the shell will be suddenly checked and the plunger, together with the sleeve, will fly forward until the point of the plunger strikes the detonating composition C and ignites the same, transmitting the flame through the opening  $b$  into the explosive charge contained in the



shell. The position of the moving parts at the moment of the action of the fuse is shown in Fig. 3.

While the drawings show a base-fuse, it will be obvious that the invention is equally applicable to front fuses.

The strength of the spring H should be such that the sleeve F will be normally held in the position indicated in Fig. 1, or will only move slightly to the rear out of said position in case of the greatest extremes of shocks and jars that would be possible under the ordinary conditions of handling the shell. Thus it should be strong enough to hold the sleeve F in place if the shell be dropped base downward; also, it should be strong enough to prevent the plunger D from being forced through the sleeve and striking the detonator if the shell be dropped point downward. The strength of the spring required could be readily determined experimentally with empty shell. The spring, however, should not be too strong to prevent the sleeve from jumping back against the action of the said spring in a violent shock of firing the gun. It will be seen that this spring H affords a yielding resistance to the plunger F, which will enable the said plunger to move slightly to the rear under ordinary shocks and jars and which will force the plunger to return to the initial position (shown in Fig. 1) unless the shock be very violent and so violent as to force the sleeve far enough to the rear to release the end of the spring E, and this spring H could be so adjusted that this would be impossible except with the violent shock incident to discharging the gun.

It will be obvious that various modifications of the herein-described apparatus might be made which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a percussion-fuse for projectiles, the combination with a fuse-stock, and a perforated plug or anvil screwed into the forward end thereof, with a detonator mounted on said plug or anvil, of a plunger mounted in said fuse-stock and provided with a flanged head, a sleeve normally inclosing the forward end of said plunger, a spring interposed between said flanged head and said sleeve, and means for locking said sleeve after it has moved a short distance to the rear on said plunger against the action of said spring, substantially as described.

2. In a percussion-fuse for projectiles, the combination with a fuse-stock, and a perforated plug or anvil screwed into the forward end thereof, with a detonator mounted on said plug or anvil, of a plunger mounted in said

fuse-stock and provided with a flanged head, an extensible spring secured to the said plunger near the forward end thereof, a sleeve normally inclosing the forward end of said plunger and confining the extensible spring, and a coil-spring interposed between said flanged head and said sleeve, and normally pressing said plunger backward in said sleeve, substantially as described.

3. In a percussion-fuse for projectiles, the combination with a fuse-stock, and a perforated plug or anvil mounted in the forward end thereof, with a detonator mounted on said plug or anvil, of a plunger mounted in said fuse-stock and provided with a flanged head and a shoulder near said head, a sleeve normally inclosing the forward end of said plunger but of less diameter than said shoulder, a spring interposed between said flanged head and said sleeve, and means for locking said sleeve after it has moved a short distance to the rear on said plunger against the action of said spring, substantially as described.

4. In a percussion-fuse for projectiles, the combination with a fuse-stock, and a perforated plug or anvil mounted in the forward end thereof, with a detonator mounted on said plug or anvil, of a plunger mounted in said fuse-stock and provided with a flanged head and a shoulder near said head, a sleeve normally inclosing the forward end of said plunger but of less diameter than said shoulder, a spring interposed between said flanged head and said sleeve, and an extensible spring mounted in said plunger and normally confined by said sleeve, but adapted to lock said sleeve to said plunger against the action of said spring when the sleeve is forced to the rear, substantially as described.

5. In a percussion-fuse for projectiles, the combination with a fuse-stock, and a perforated plug or anvil screwed into the forward end thereof, with a detonator mounted on said plug or anvil, of a plunger mounted in said fuse-stock and provided with a flanged conical head engaging in a corresponding recess in said stock, and provided with a recess near the forward end thereof, a coil-spring inclosing the rear end of said plunger, an extensible spring E secured near the forward end of said recess, and provided with a point normally tending to spring outward, a sleeve normally inclosing the forward end of said plunger and said spring E, and engaging the free end of said spring when said sleeve has moved a short distance to the rear on said plunger against the action of said spring, substantially as described.

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Witnesses:

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