

No. 815,958.

PATENTED MAR. 27, 1906.

J. W. HARRIMAN.
PERCUSSION FUSE.

APPLICATION FILED APR. 7, 1906.

Fig. 1.

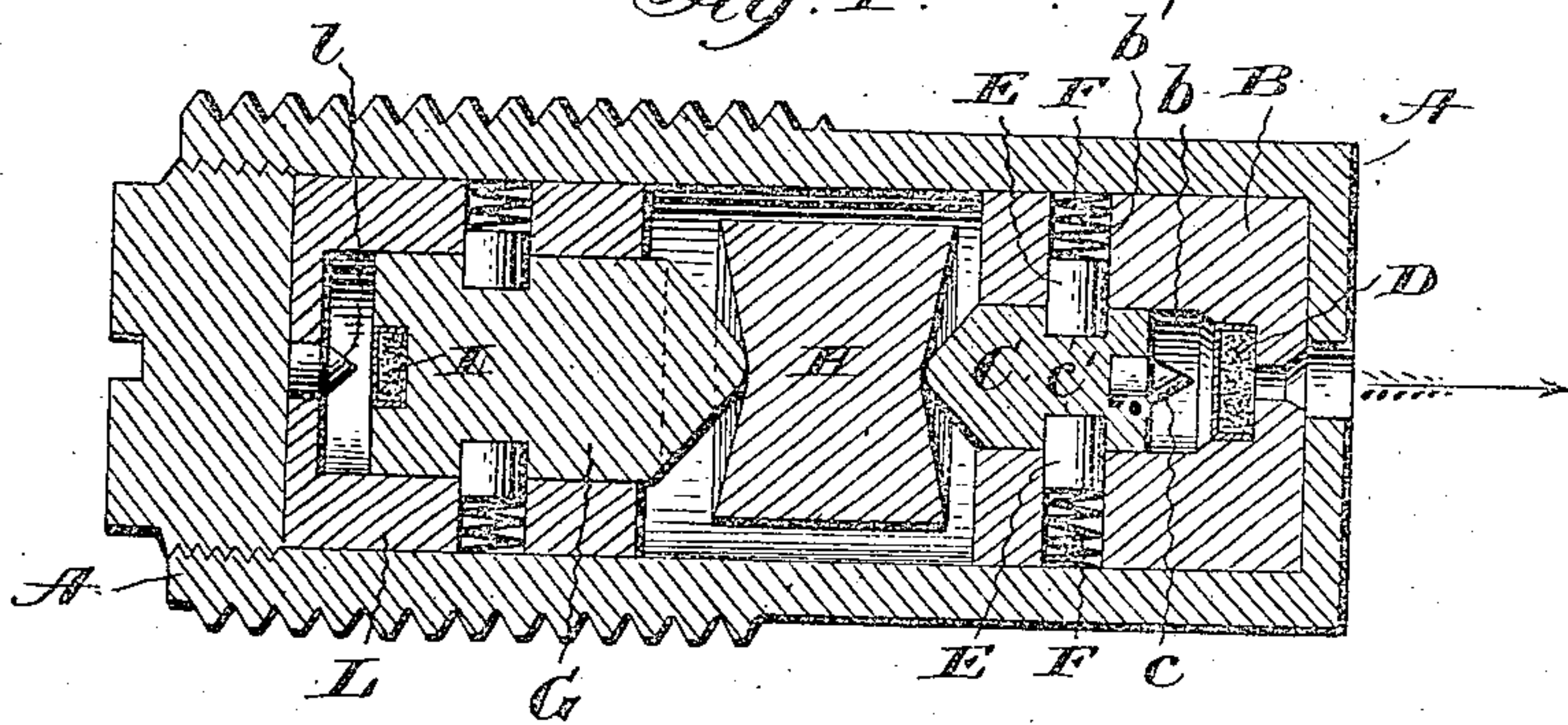


Fig. 2.

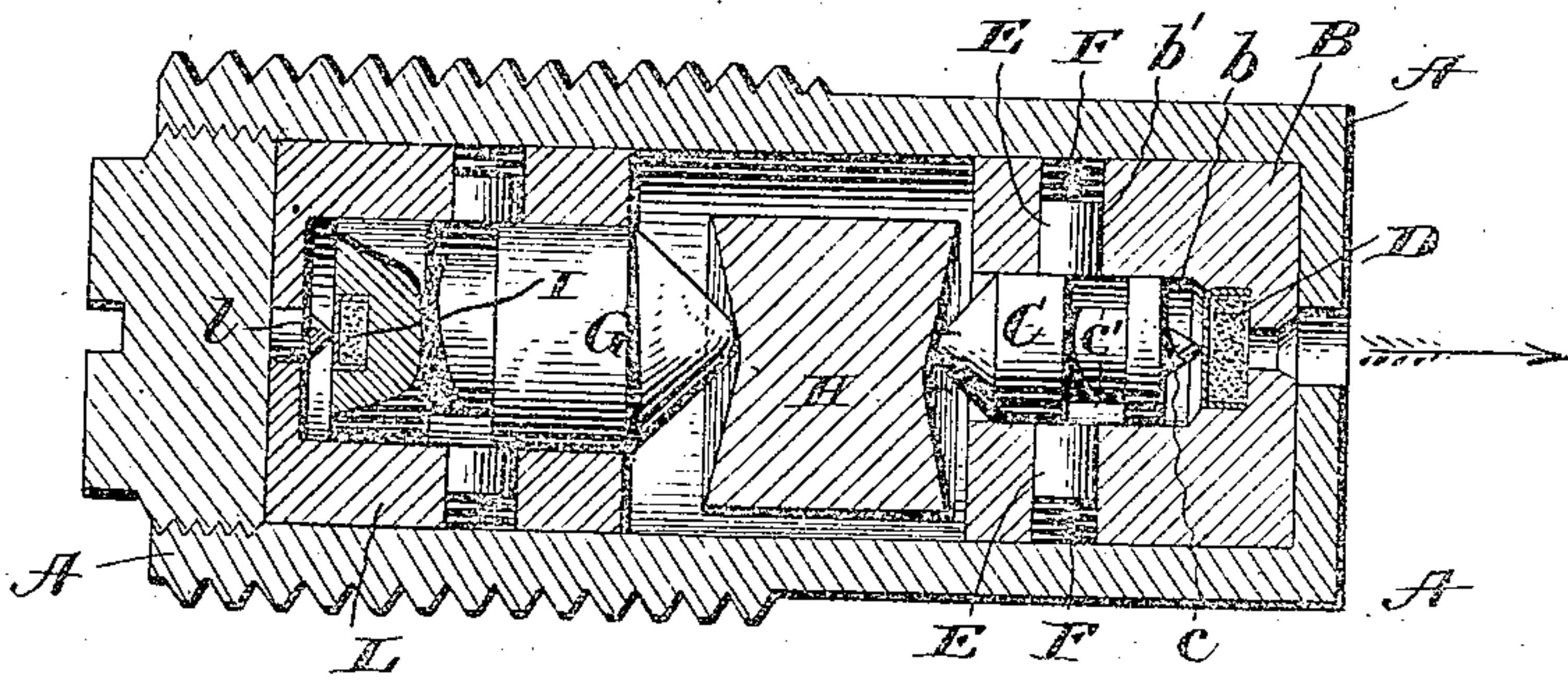
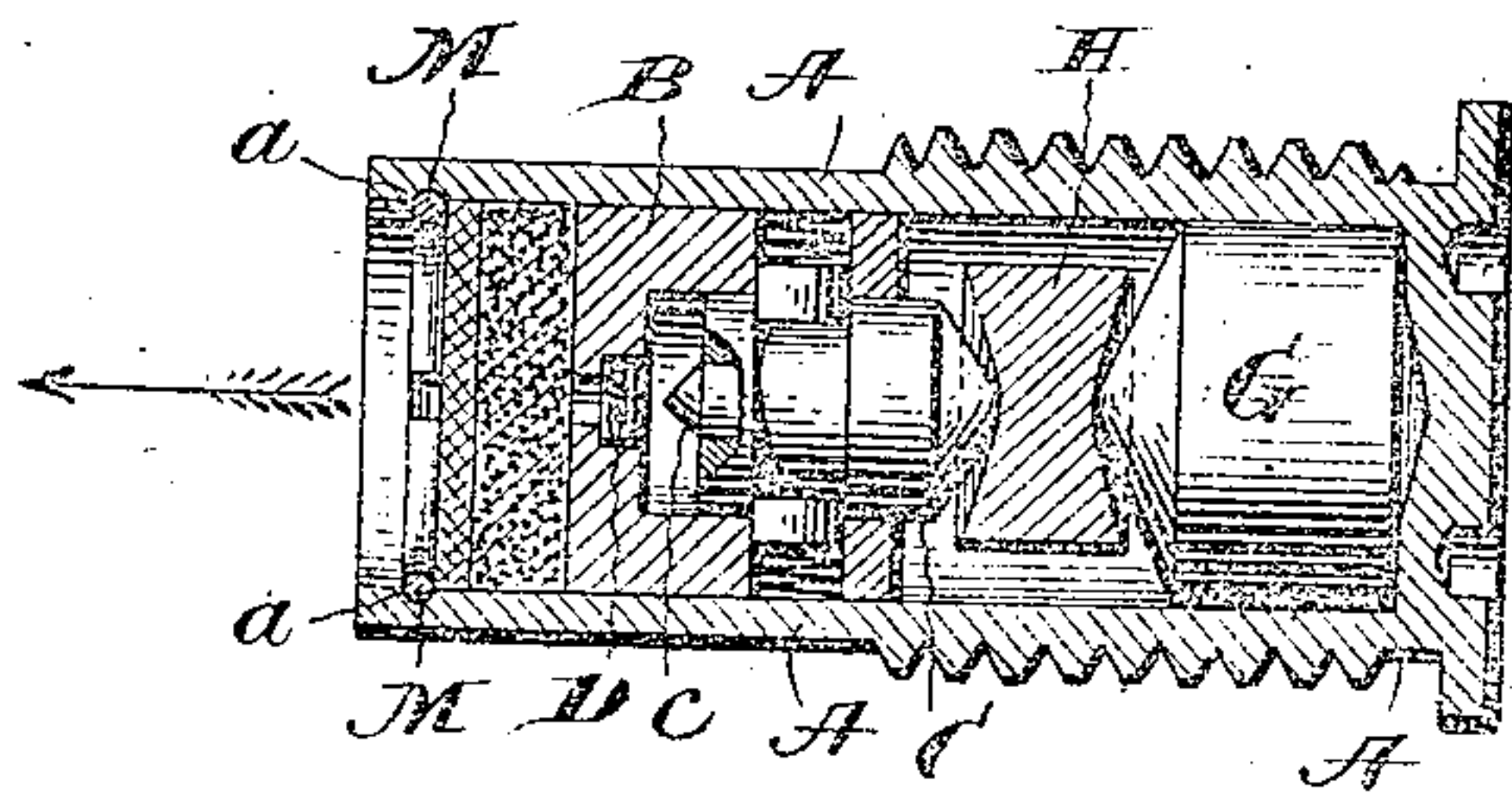


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

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PERCUSSION-FUSE.

No. 815,958.

Specification of Letters Patent.

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Application filed April 7, 1905. Serial No. 254,343.

To all whom it may concern:

Be it known that I, JOSEPH WM. HARRIMAN, of Washington, in the District of Columbia, have invented a certain new and useful Improvement in Percussion-Fuses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

10 Figure 1 is a longitudinal section of a percussion-fuse embodying my invention, the parts being shown in locked or unarmed position of the fuse. Fig. 2 is a similar view showing the parts in the armed position, and
15 Fig. 3 is a similar view of a different construction of fuse embodying my invention.

My invention relates to that class of fuses in which the firing-pin is retained in an unarmed position by holding devices that are released by centrifugal force due to the rotation of the projectile given it by firing it from the gun; and my object has been to provide a fuse of this description whose construction shall be simple, whose operation shall be certain both in arming it and in exploding the primer on impact, and which will not prematurely operate either in the flight of the projectile or at other times; and to these ends my invention consists in the fuse having the construction substantially as hereinafter specified and claimed.

Referring to the drawings, the fuse shell or casing A which I illustrate is of the usual form, it consisting of a tube closed at one end, which is the front end of the fuse. Within the casing near the front end and closely fitting the same is a cylindrical block B, having a chamber *b*, in which is slidably mounted a plunger C, carrying at its front end a firing-pin *c*, the front end of the cylindrical block B having a cavity at its center for a primer D. The plunger C has between its ends an annular groove to form a shoulder *c'* for engagement by one or more radially-movable cylindrical blocks or pins E, that are slidably mounted each in a radial opening or hole *b'* in the cylindrical block B and extending from the chamber *b* to the periphery of the block. Bearing upon the outer end of each pin is a spring F or other means to yieldingly retain the pin with its inner end projected beyond the shoulder *c'* on the plunger C, and thus restrain the plunger from forward movement.

The locking-pins E are thrown outward by centrifugal force due to the rotation of the projectile in its flight, and thus release the firing-plunger C or arm the fuse, so that it is in readiness to act to explode the primer when the projectile strikes.

In the rear end of the fuse-casing is slidably mounted a hammer G, that consists of a cylindrical block that closely fits but is free to slide axially in the casing, and interposed between the hammer and the firing-plunger C is a loose block H, preferably of the form of a disk or cylinder of sufficiently less diameter than the interior of the casing as to permit the block to move freely in a radial or lateral direction. The function of said loose block is to move the firing-plunger C forward as soon as it is released from the locking-pins, but with not force enough to explode the primer, so as to carry the shoulder *c'* beyond the locking-pins and to hold the firing-plunger in such position to prevent reengagement with the shoulder *c'* by the locking-pins, and thus insure that the fuse will be in armed position at the time of impact or striking of the projectile. To enable the block H to perform this function, its ends and the ends of the hammer G and the plunger C, which adjoin it, are inclined so that lateral movement of the block will result in forward movement of the firing-plunger.

As shown, a conical depression is formed in each end of the block, and a corresponding projection is formed on the ends of the hammer and firing-plunger, respectively, so that lateral movement of the block results in its own movement forward, as well as in forward movement of the firing-plunger. If desired, the inclined surfaces need be provided only on one end of the block and the end of the adjacent part—either the hammer or the firing-plunger. Inasmuch as the block H does not constitute the hammer for moving the firing-plunger to fire the primer when the projectile strikes, but the hammer consists of a separate piece, whose blow is transmitted through the block to the firing-plunger, the block need be given a weight only sufficient to move and hold the firing-plunger forward without danger of firing the primer. It will be seen that were the block H made to serve as the hammer it would have to be given such weight that there might be danger of its dis-

placement laterally by centrifugal force during the flight of the projectile and consequent premature firing of the primer and explosion of the projectile. As my hammer cannot
 5 move radially or sidewise under centrifugal force and as by reason of the employment of a separate piece for the hammer the block H can be given a weight that will not be sufficient to move the firing-plunger with force
 10 enough to explode the primer, there is no liability in the use of my fuse of premature explosion during the flight of the projectile from the cause mentioned. Moreover, by having the inclined or conical surface on the hammer
 15 instead of on the rear end of the fuse-casing manufacture is facilitated and cheapened, because of the obviously greater difficulty of making the latter construction.

To supplement the weight of the hammer
 20 for moving the firing-plunger for firing its primer, I may provide means for subjecting the rear end of the hammer to pressure, which means, as shown in Fig. 1, consist of a cap or primer I, placed in a cavity in the rear end
 25 of the hammer, and a firing-pin L. To prevent premature explosion or firing of the cap I, the hammer is restrained from endwise movement by centrifugally-operated means similar to that used for the firing-plunger.
 30 Preferably when the construction I have just described is used the hammer is mounted in a chambered cylindrical block L, similar to that used with the firing-plunger, which block closely fits the fuse-case and at its rear closed
 35 end carries the firing-pin L. When, however, the weight of the hammer alone is depended upon to actuate it, such chambered block L is not employed, but, as shown in Fig. 3, the hammer is fitted to the fuse-casing. The
 40 cap I will be fired should the projectile, failing to strike point on, strike in such position—as, for example, at or near the rear end—as to cause a relatively rearward movement of the plunger G. The pressure resulting from
 45 the explosion of the cap I under these conditions would of course move the plunger G forward, and thus through the interposed block H move the plunger C and explode the cap D.

The parts within the fuse-casing are retained therein by some suitable form of retaining device applied to the forward end of the casing. I prefer to use for this purpose a split ring M, which after the parts have been
 55 assembled in the casing is inserted in the open forward end and sprung behind a shoulder α , provided on the interior of the casing to retain the split ring.

Having thus described my invention, what
 60 I claim is—

1. In a fuse, the combination of a firing device, automatically-unlocked means for restraining said device from firing movement, a hammer, and means for transmitting the

blow of the hammer to the firing device inter- 65 posed between them and at all times continuing in contact with the firing device, under varying distances between the same and the hammer.

2. In a fuse, the combination of a firing device, automatically-unlocked means for restraining said device from firing movement, and a hammer means for moving and retaining said firing device after being released, to prevent relocking thereof interposed between 75 the firing device and said hammer.

3. In a fuse, the combination of a firing device, automatically-unlocked means for restraining said device from firing movement, a hammer and means for moving and retaining 80 said firing device after being released to prevent relocking thereof, consisting of a loose block interposed between the firing device and said hammer.

4. In a fuse, the combination of a firing device, automatically-unlocked means for restraining it from movement, a hammer mounted for movement only in the direction in which said firing device is movable, and a part interposed between the hammer and the 90 firing device, of varying thickness, in the direction in which the same are movable, and movable crosswise of such direction.

5. In a fuse, the combination of a firing device, automatically-unlocked means for restraining it from movement, a hammer mounted for movement only in the direction in which said firing device is movable, and a part interposed between the hammer and the firing device having an inclined surface to co- 100 operate with a like surface on one of said parts, and movable crosswise of the direction of their movement.

6. In a fuse, the combination of a casing, a firing device movable axially of the casing, automatically-released locking means for said firing device, a hammer movable only axially in the casing, and a part interposed between the hammer and the firing device having an inclined surface to engage a like 110 surface on the hammer, and movable crosswise of the casing-axis.

7. In a fuse, the combination of a firing device, an automatically-unlocked holding means therefor, a hammer movable only in the direction of which said firing device is movable, and a part interposed between said device and said hammer, having inclined surfaces to coact with similar surfaces on each of 115 said parts, and movable crosswise of the direction of movement thereof.

8. In a fuse, the combination of a firing device, automatically-unlocked means for restraining it from movement, a hammer for said firing device, and means for producing 125 an explosion to subject the hammer to pressure to supplement its weight to operate the firing device.

9. In a fuse, the combination of a firing device, automatically-unlocked means for restraining said device from movement, a hammer, automatically-unlocked means for restraining it from movement, and means for
5 producing an explosion to subject the hammer to pressure to operate the firing device.

In testimony that I claim the foregoing I have hereunto set my hand.

JOSEPH WM. HARRIMAN.

Witnesses:

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CHAS. J. WILLIAMSON.