2 Sheets—Sheet 1.

B. B. HOTCHKISS.

Projectile.

No. 50,357.

Patented Oct 10, 1865.

Fig. 1.

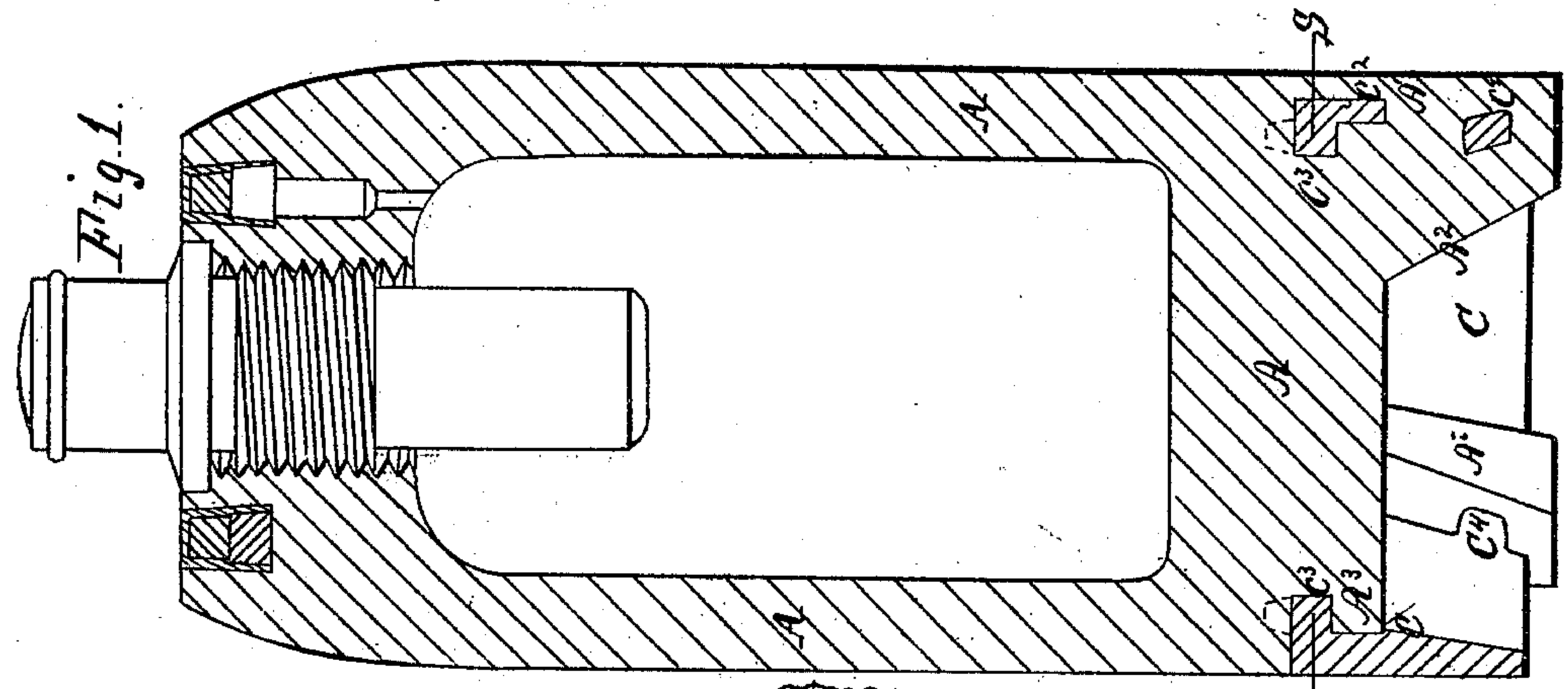


Fig. 2.

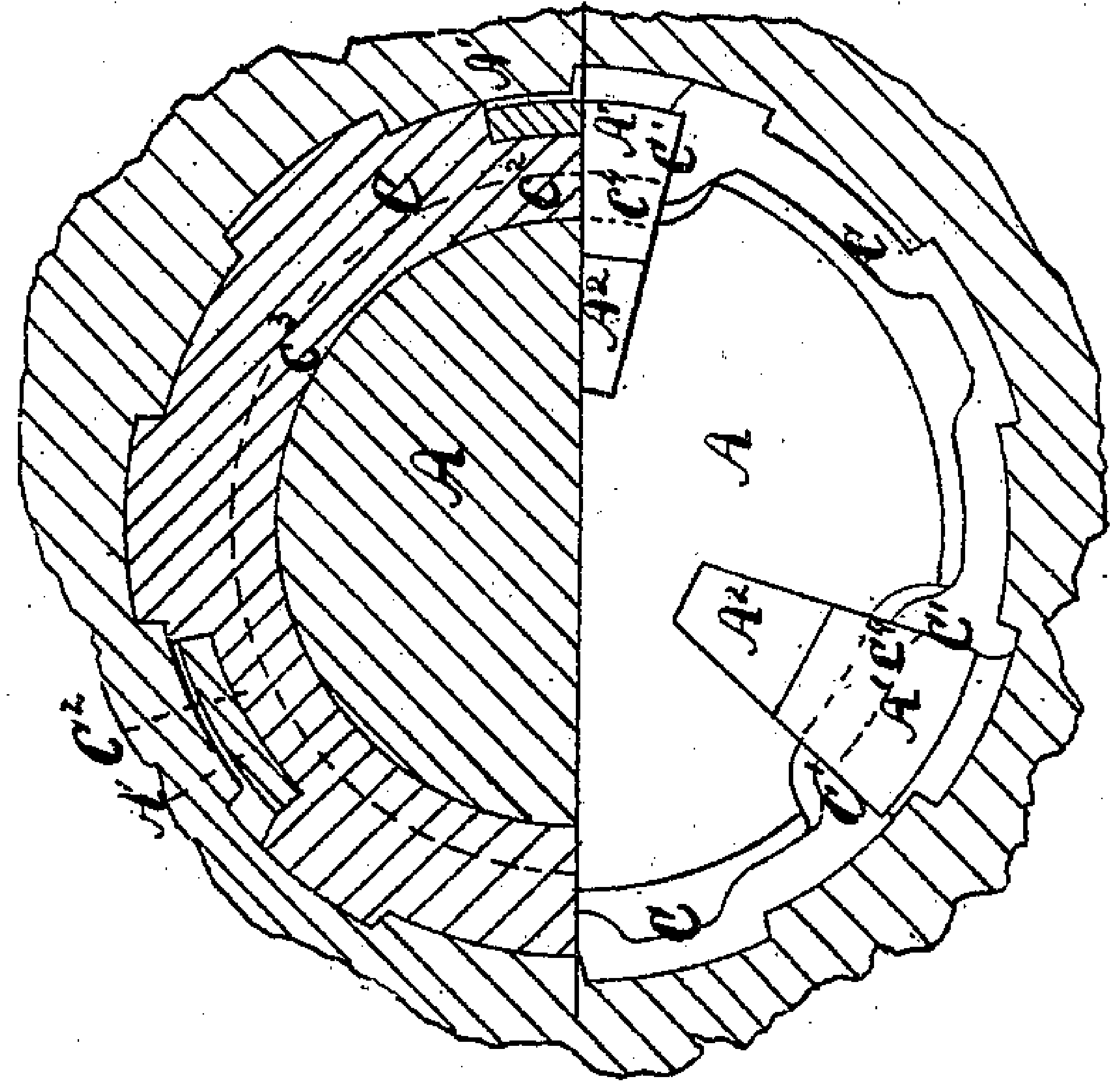
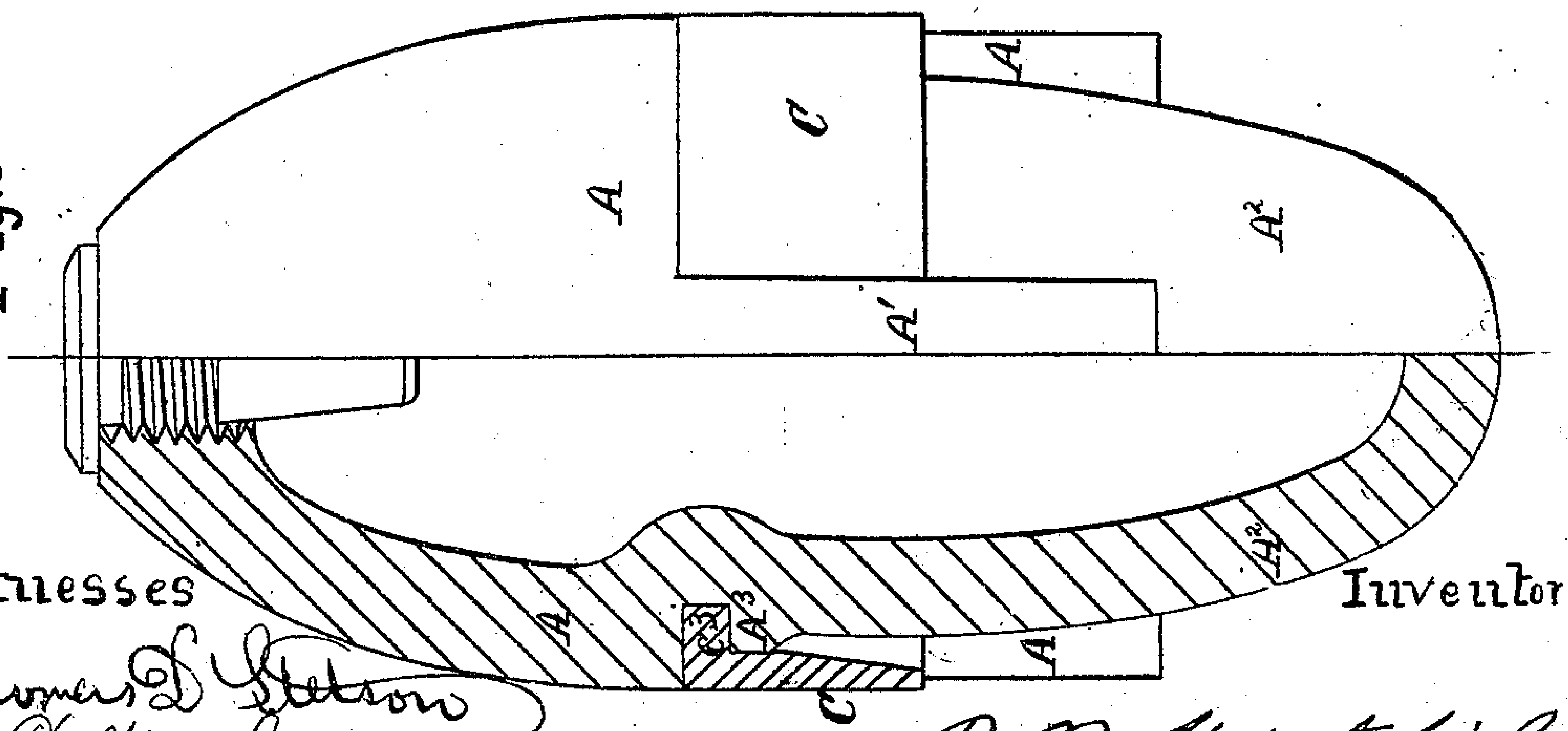


Fig. 3.



Witnesses
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2 Sheets—Sheet 2

B. B. HOTCHKISS.

Projectile.

No. 50,357. Patented Oct 10, 1865.

Fig. 6.

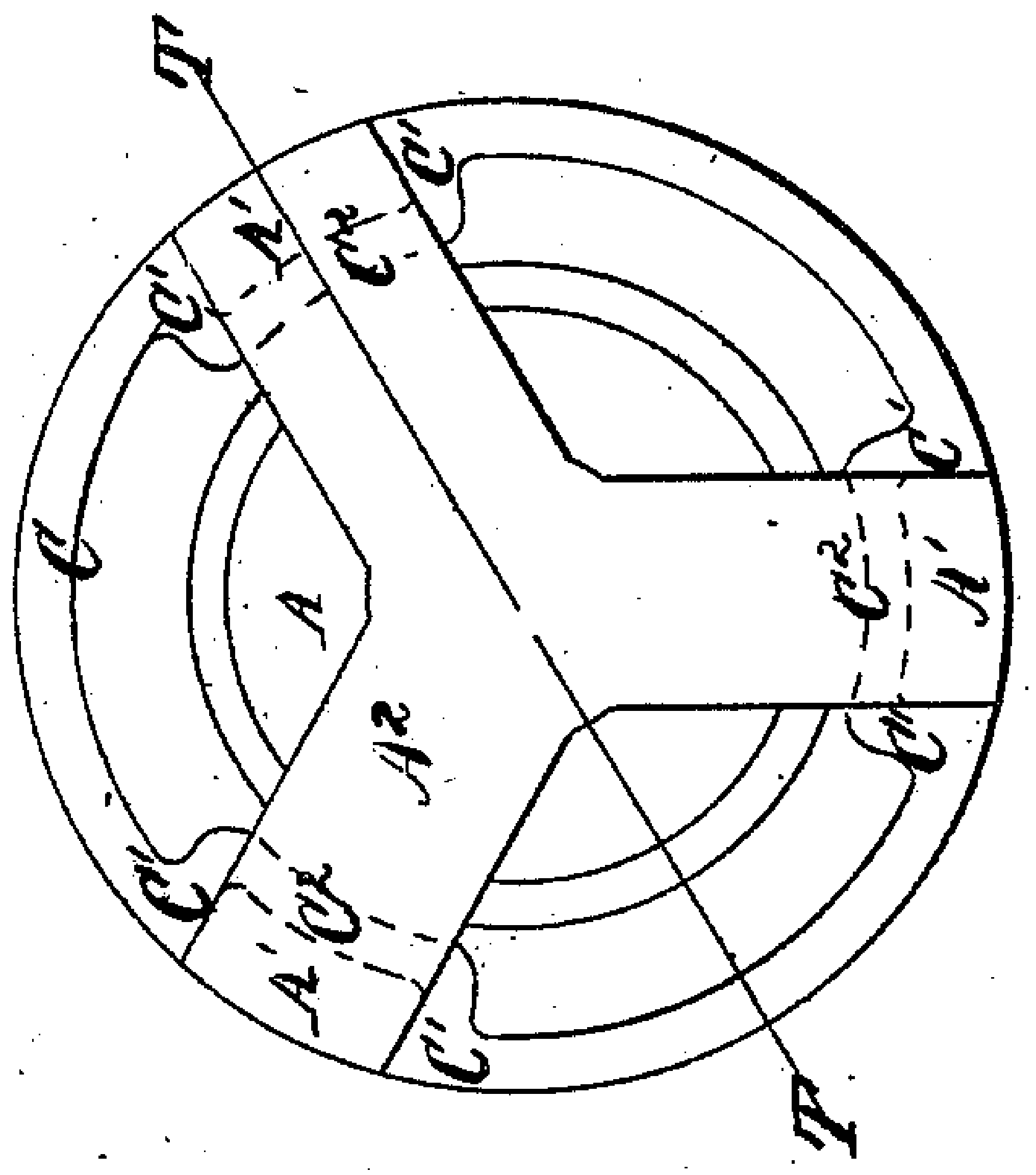


Fig. 5.

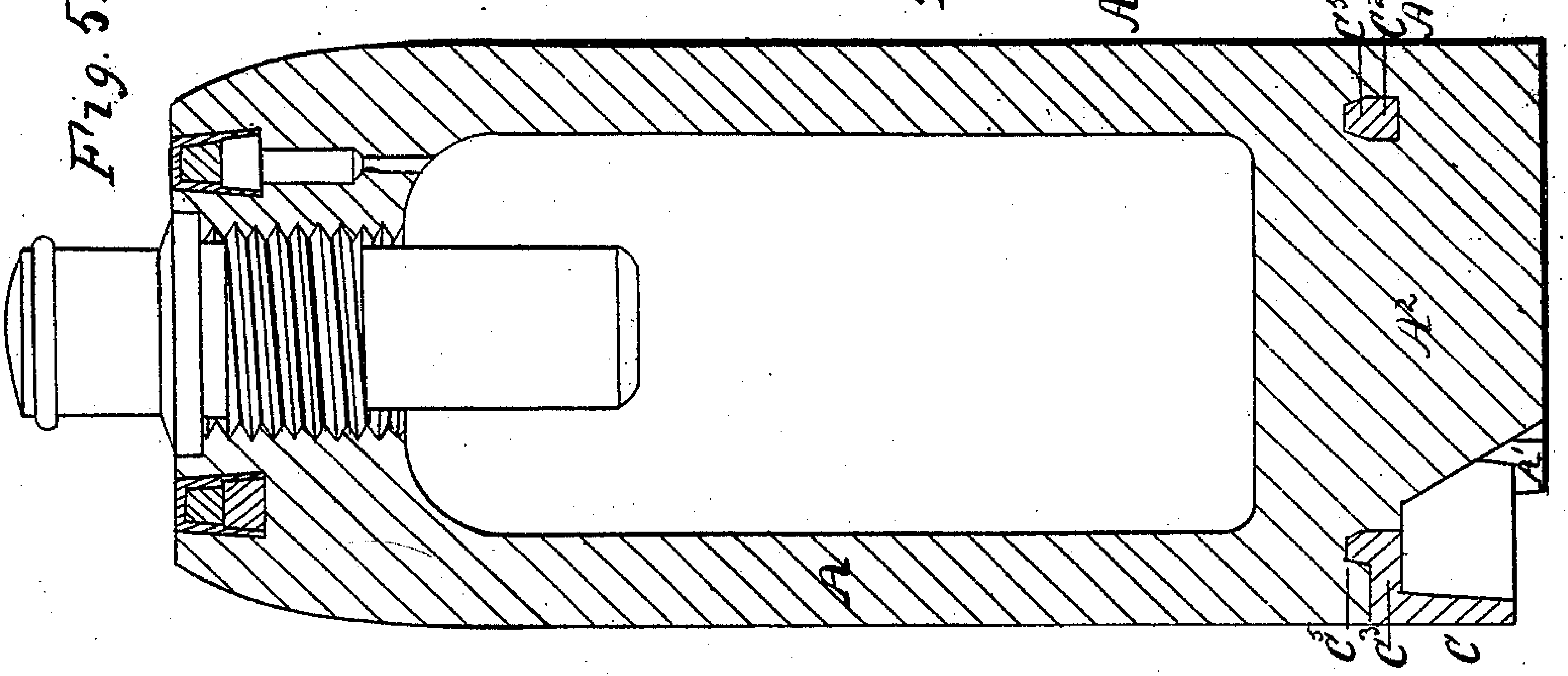


Fig. 4.

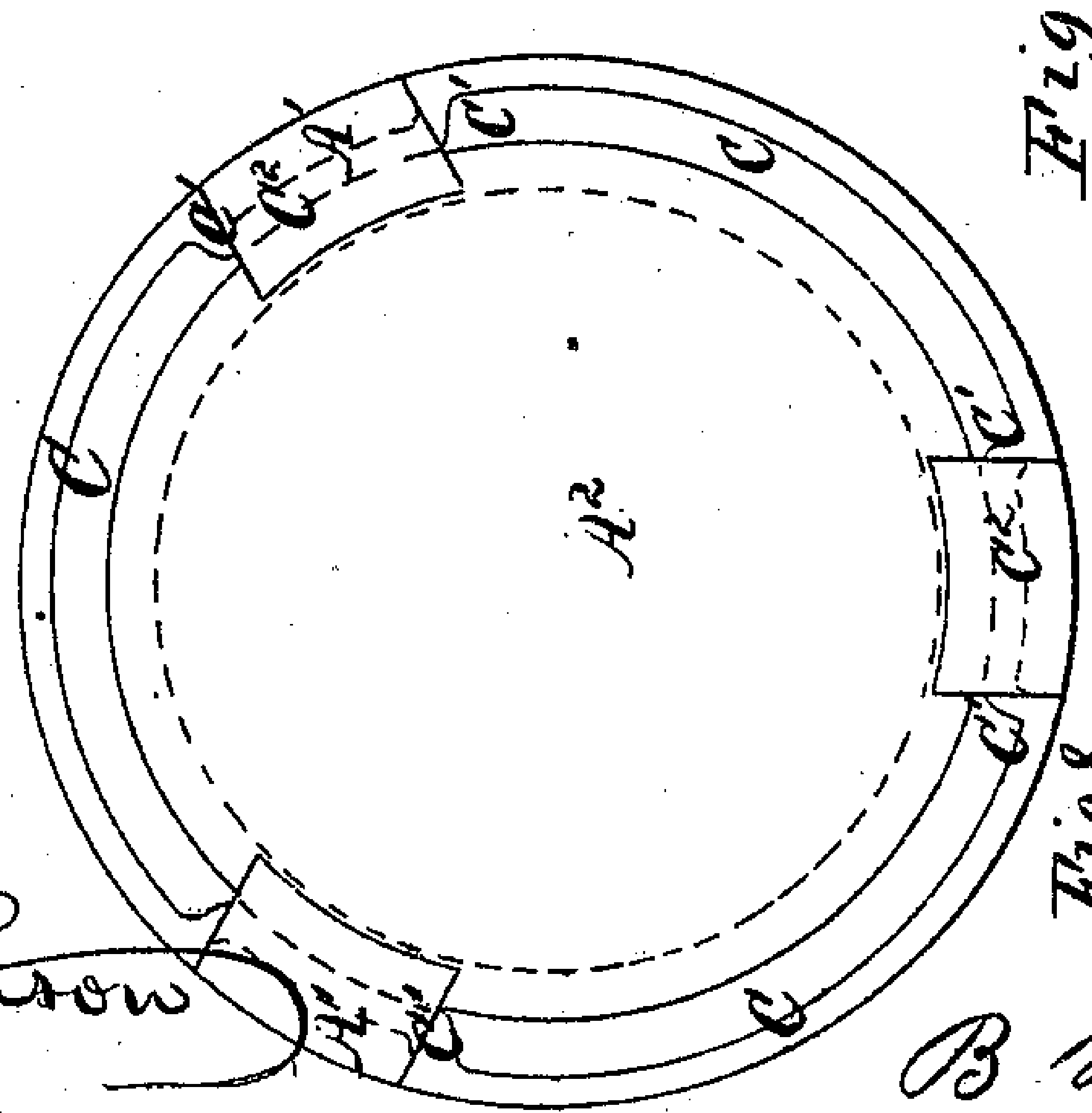


Fig. 7.

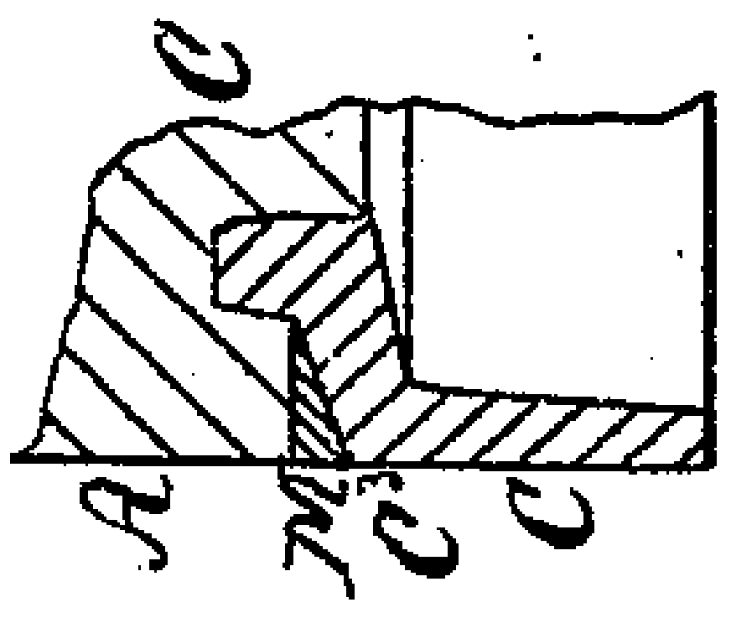
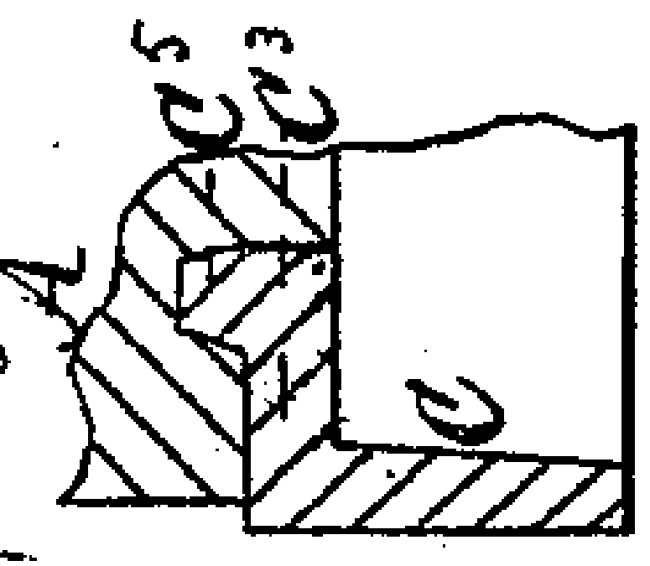


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

B. B. HOTCHKISS, OF NEW YORK, N. Y.

IMPROVEMENT IN PACKING PROJECTILES FOR RIFLED ORDNANCE.

Specification forming part of Letters Patent No. **50,357**, dated October 10, 1865.

To all whom it may concern:

Be it known that I, B. B. HOTCHKISS, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Projectiles for Ordnance; and I do hereby declare that the following is a full and exact description thereof, which has been prepared with a view to the obtaining of Letters Patent therefor.

My invention relates to that class of projectiles which are provided with packing adapted to expand to fill the gun and to take the form of the rifle-grooves; and it consists in certain means of preventing the expansible portion from "ringing" or twisting around on the main body; in means of providing passages for the propelling gases past the packing to relieve the gun and ignite the fuse of the projectile when explosive; in means of causing the expansible portion to adhere or cling to the main body, and in means of partially protecting the rear edge of the packing or expansible portion from being injured in handling and transportation.

My invention differs radically from the previously-patented inventions known as the "Hotchkiss projectile" in the fact that the cap employed in the previous projectiles at the rear end to wedge open the packing and gage the extent to which it may be made to expand is entirely dispensed with, and the expansion is induced by the direct action of the propelling-charge.

The main body of my present projectile is a single casting. It is recessed to allow the locking thereon of the expansible packing-ring. The latter is not a continuous ring expansible alike all around the projectile, but, on the contrary, is interrupted and bridged across at certain points by the main body of the casting, so as to present a broad shoulder to prevent ringing and to materially interfere with or entirely prevent the expansion of the packing at those points, and insure a passage for the flame past the packing at those points. The packing is continued past those points, but in a different form, and by preference at a place or places nearer the axis of the projectile, so as to obtain the desired unity and strength in the packing to enable it to cling to the main body. I extend the metal of the main body farther rearward at those points, and thus am able to drop my projectiles on the floor or to strike them together or otherwise subject their rear faces to considerable violence without bruising the edges of the packing, because the concussion is received on the extensions or legs of the main casting instead of on the packing.

Such being the nature and objects of the invention, I will proceed to describe more in detail the manner in which the invention is carried into practical effect by reference to the accompanying drawings, and to letters and numbers denoted thereon.

Similar letters of reference indicate like or corresponding parts in all the drawings.

Figure 1 is a longitudinal section of my projectile before its packing has been expanded, and Fig. 2 is a duplex figure, showing my projectile after its packing has been expanded; the lower half representing a rear view and the upper half a cross-section on the line S S in Fig. 1.

A is the main body, of cast-iron, and C is the expansible packing, of brass. A' A' A' are legs from the main casting A, which extend rearward across the packing C and a little distance beyond or rearward of the latter.

C' C' C' are stout shoulders in the packing C, adapted to press fairly and squarely against the corresponding sides of the legs A' to resist the tendency of the packing to ring or slip around on the projectile when discharged from a gun with quick rifling.

C^2 C^2 C^2 are parts of the packing-ring C, which extend across inside of the legs A' and unite the packing in a single but not circular piece, extending quite around.

A^2 A^2 A^2 are parts of the main body A, which extend rearward within or nearer the axis of the projectile than C^2. The parts A^2 are strongly joined both to the main part A and the legs A', and strengthen the whole. A, A', and A^2 are cast together.

C^3 is an internal flange near the front edge of the packing. It extends into a corresponding recess (circular groove or rabbet) provided in the main body, as represented. A^3 is a flange or overhang extending from the main body into the rabbet, and aiding to lock the packing-ring upon the main body. In manufacturing my projectile, I first produce by proper molds and cores the casting A, with its several projections, A', A^2, and A^3, and with its groove or rabbet, as indicated, and afterward cast thereon the more fusible packing C, C^1, C^2, and C^3.

The packing may be of other metal, but I prefer soft brass. It may be coated or shielded on its outer surface with a softer metal or alloy, or with fibrous or greasy material, and may be caused to partially amalgamate or solder to the casting A by a well-known means; but I do not consider such usually necessary.

C^4 C^4 C^4 are additional connections of the packing material C across the inner side of the legs A′ A′ A′. Each connects near the rear edge of the packing in the manner represented. They may be omitted without serious detriment. I make the exterior of the packing C correspond in diameter with the exterior of the main body A. It is introduced in the gun in such condition, but when the gun is discharged the great pressure of the ignited powder of the propelling-charge acts on the inner surface of the packing C, and expands or increases its diameter so as to fill the grooves of the gun and compel the packing-ring to rotate and follow the spiral path of the same. In doing so the shoulders C′ press fairly against the sides of the legs A′, supported by the braces A^2, and compel the entire projectile to assume the same motion. But that portion C^2 of the metal of C which is within the legs A′ cannot radially expand outward, being forbidden by the presence of the legs A, so that the packing does not expand all around the projectile, but leaves the places A′ A′ A′, so that the gases may flow along through the spaces there provided between the legs A′ and the inner surface of the gun to ignite the fuse at the front. The channels thus provided for the gases may be hollowed out to increase their capacity, if desired.

Fig. 3 is a longitudinal section, and Fig. 4 a rear view, of a different form of my invention. In this form the legs A′ are extended still farther rearward, and the supporting portion A^2 is enlarged and extended rearward, so as to materially change the proportions of the projectile; but the novel features of my invention will be recognized.

Fig. 5 is a longitudinal section, and Fig. 6 a rear view, showing another form of my invention. In this the bracing portion A^2 are less than in the form last described, but greater than in the first form, or, rather, they are extended directly across the rear of the projectile, so as to be stronger. The chief feature in this form not before described lies in the lip C^5, extending forward from the inner edge of the part C^3 of the packing. It extends into a recess cored for it in the casting A, as will be apparent, and locks the packing still more effectually to the body A. A similar lip, C^5, extending quite along the lip C^3, or in points thereon, as desired, may be used on the other forms of my projectile, as indicated slightly in red outline on the other figures.

It will be observed that in Figs. 3 and 4 the legs A′ extend much farther in rear of the packing-ring C than in the other figures. This is done mainly to afford a longer and better bearing for the projectile in the gun.

Figs. 7 and 8 represent a modification of the form shown in Figs. 5 and 6, Fig. 7 showing the condition of the packing-ring before firing, and Fig. 8 its condition after firing.

M is a quantity of grease, which is forced out when the packing is expanded.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. The bridges or posts A′, extending across the packing flush with the surface of the main casting A, and adapted to allow windage at those points, substantially as and for the purposes herein set forth.

2. Prolonging the legs or posts A′ in the rear of the packing C, so as to protect the latter in handling and transportation, substantially in the manner and for the purposes herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

B. B. HOTCHKISS.

Witnesses:
THOMAS D. STETSON,
D. W. STETSON.