

J. G. BUTLER.
PROJECTILES FOR ORDNANCE.

No. 178,595.

Patented June 13, 1876.

Fig: 1.

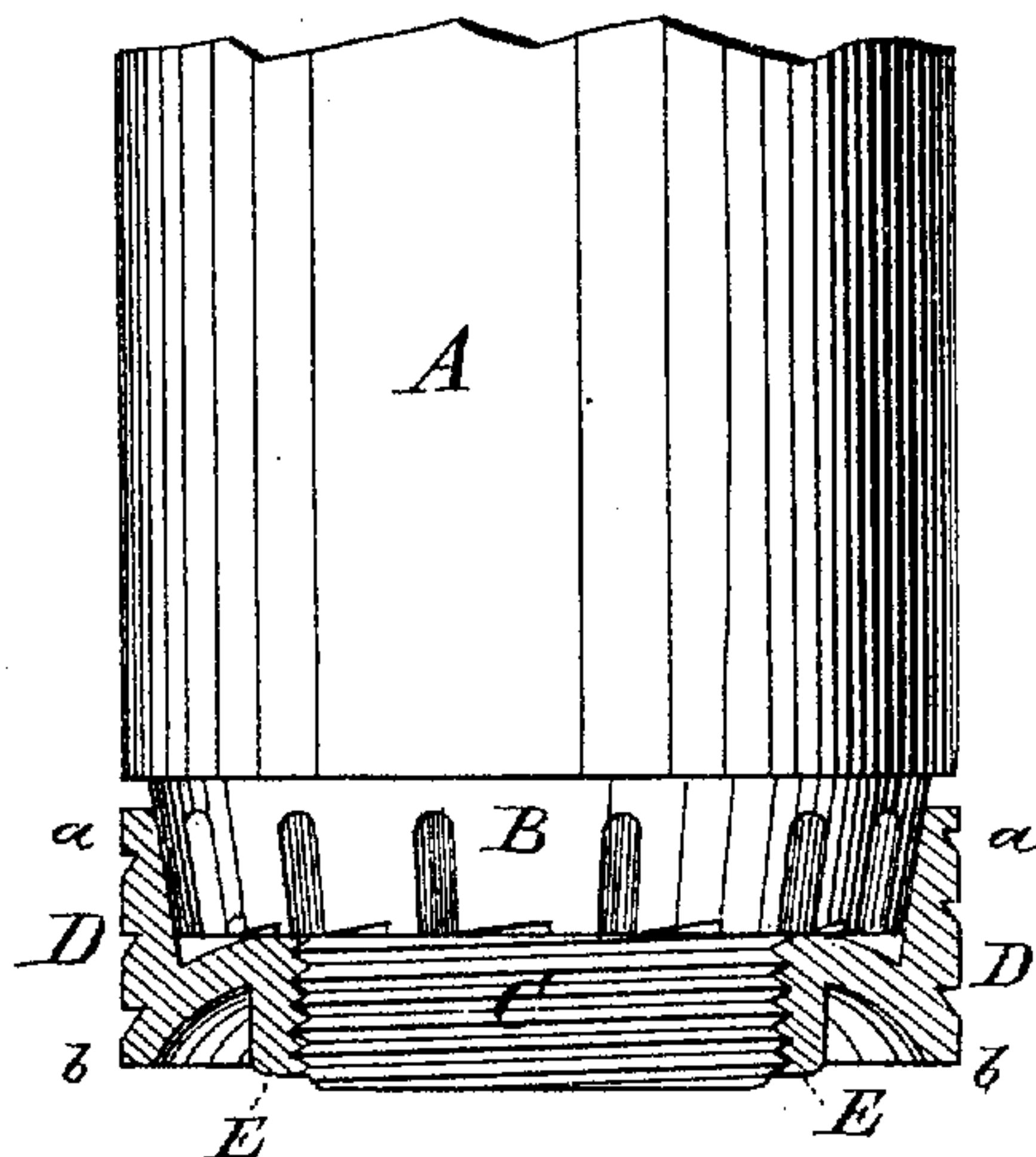


Fig: 3.

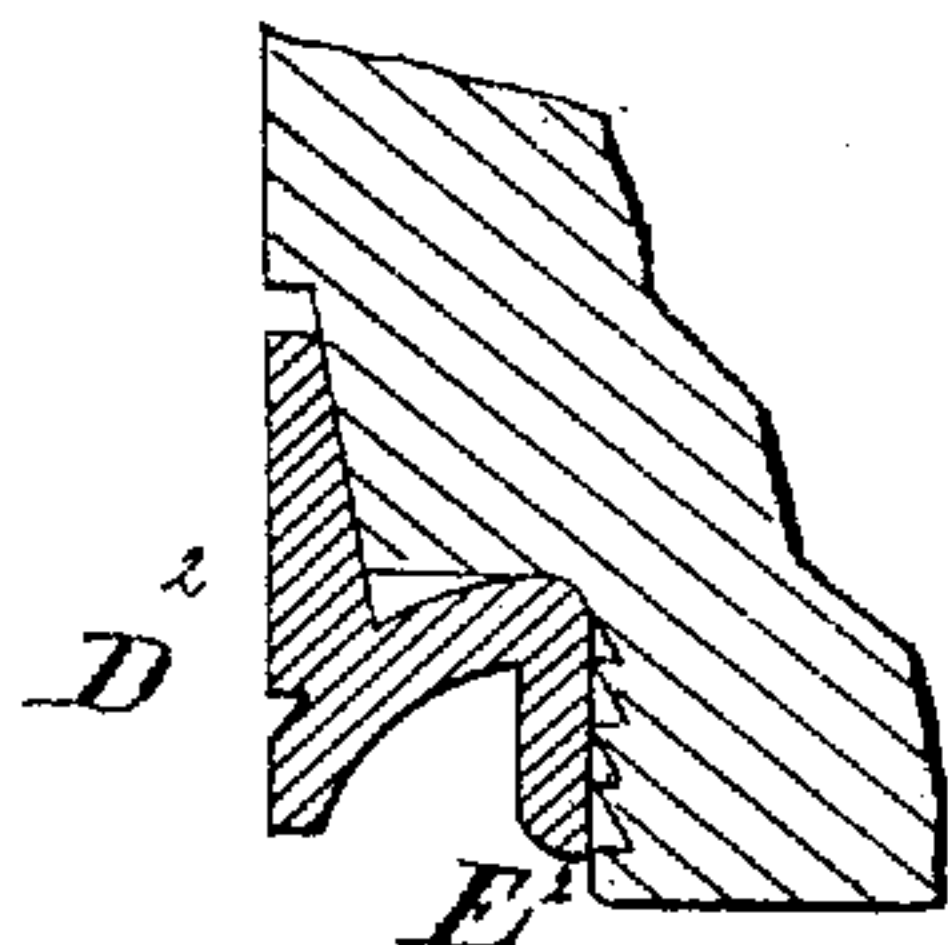


Fig: 4.

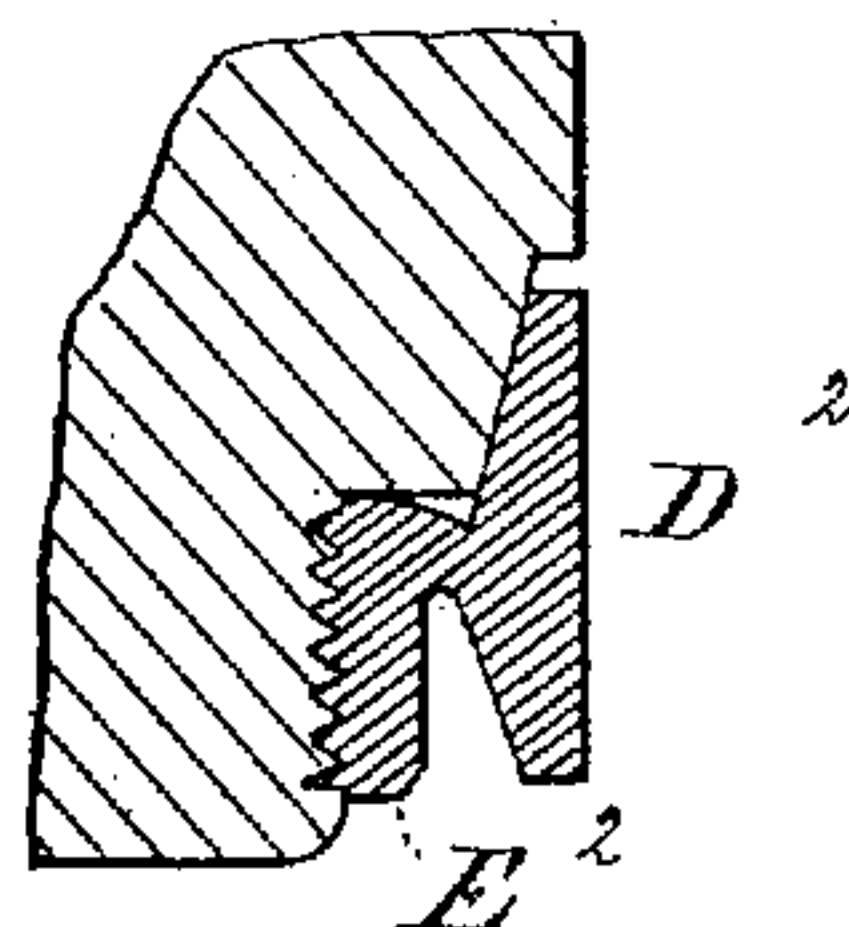
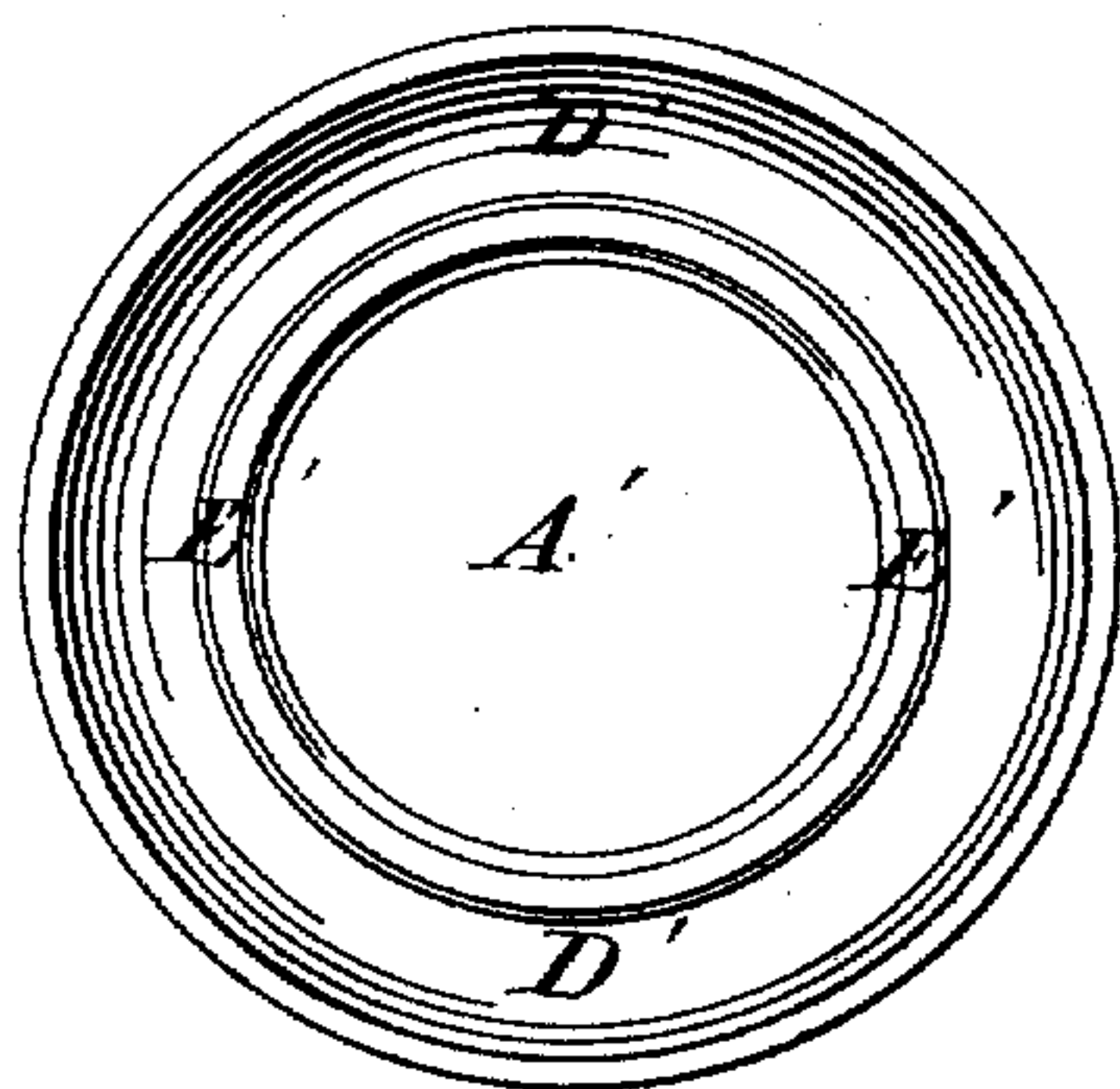


Fig: 2.



WITNESSES:

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JOHN G. BUTLER, OF NEW YORK, N. Y.

IMPROVEMENT IN PROJECTILES FOR ORDNANCE.

Specification forming part of Letters Patent No. **178,595**, dated June 13, 1876; application filed September 11, 1875.

To all whom it may concern:

Be it known that I, JOHN G. BUTLER, of the city, county, and State of New York, have invented a new and useful Improvement in Projectiles for Rifled Ordnance, of which the following is a specification:

In the service of rifled cannon it has been found that an impression of the rifling may be satisfactorily secured by the action of the discharge upon a concave or a convex disk, which is thereby flattened against the base of the projectile at the same time, forcing a circular wedge or key upon a conical surface provided for that purpose upon the rear end of the projectile. Sabots of this nature, however, are extremely liable to strip from the projectile, either in the gun or during flight, mainly owing to the distortion of the sabot by the force of discharge, which acts to enlarge, and, therefore, to loosen it upon the projectile, so that the moment the projectile leaves the gun, and the powder gases cease to act upon it, it detaches from the iron body of the projectile. To correct this evil recourse has been had to riveting, and also to a central bolt with a large head; but these devices are often ineffectual.

The invention will first be described in connection with the drawing, and then pointed out in the claim.

In the case of large projectiles the sabot, if secured by a bolt, or riveted near the center, must cover a very large portion of the base of the projectile, whereas by means of my invention the sabot may be applied in the shape of a comparatively delicate flanged ring, whereby not only the weight is greatly reduced, but much strength is added, since the sabot is secured to the projectile so much nearer to its periphery; and in this connection still another object may be mentioned as secured by my invention—namely, the reduction of the distorting effects of the discharge upon the sabot, whereby it is frequently broken by presenting a greatly-reduced area for the operation of these forces; moreover, the sabot, being so much more securely attached, is less liable to sustain injury from rough handling and transportation, and this danger is further prevented by allowing the base of the projectile proper to project entirely through and beyond

the ring, so that a heavy projectile may strike or fall upon its base without injury to the sabot.

In the accompanying drawing, Figure 1 represents a side elevation of my improved projectile, with sabot attached, shown in section; Fig. 2, an end view of the same; and Figs. 3 and 4 are detail cross-sections of the sabot, showing slightly-modified forms of the same.

Similar letters of reference indicate corresponding parts.

A represents the iron body of the projectile, which is made with a conically-shaped base, B, and a central portion or extension, C, of the base, made of somewhat smaller diameter. D is the improved sabot, which is of ring shape, and fitted by a tapering cylindrical part, *a*, upon the conical base of the projectile, and by an inner smooth or threaded flange, E, upon the threaded or notched extension or narrower base portion C. The inner flange E fits closely over the portion C of the projectile, and forms, with the surrounding concave or cup-shaped portion of the sabot, an annular cavity or gas-chamber, into which the powder gases enter, so as to produce the simultaneous spreading of the circumferential lip *b* and of the inner flange E. The action of the gases on the outer lip or edge part produces the fitting of the sabot to the windage of the cannon and the secure hugging of the outer cylindrical flange on the conical base of the projectile, while the inner flange binds firmly on the threaded or notched portion C, and acts as a gas-check, increasing the tight connection of sabot and projectile, and rendering the detaching of the sabot almost impossible.

In Fig. 2, A' represents the central portion of the projectile; D¹, the sabot, and E¹ the inner flange; D² and E² representing the corresponding parts in Figs. 3 and 4.

The action of this projectile is as follows: The gun being discharged, the sabot D is driven forward upon the projectile, the forward portion *a* wedging outward upon the conical surface B until windage is filled, or a slight impression of the rifling is taken, while the other portion, *b*, is expanded deeply into the rifling by the direct action of the gases. The threaded portion C prevents the sabot from springing or being thrust backward, while, at the same time, the downward press-

ure of the gases upon the flange E causes the sabot, as a whole, to hug the projectile tightly, and from the same cause this flange is a practical gas-check, and effectually prevents the entrance of gas between the sabot and the iron body of the projectile.

Although it is preferred to use the screw-thread, especially for projectiles of large caliber, yet it is probable that the downward pressure of gases upon the inner flange will be sufficient to sink it into any irregularities of surface provided for the purpose upon the base of the projectile in place of the screw. In such cases, as, in Figs. 3 and 4, the sabot would be simply forced upon the projectile in its manufacture; and we should trust to the "bite," secured by means of the gas-pressure upon the flange E², to retain the sabot in position during its passage through the gun and during flight.

It is probable that the friction of the sabot, aided by the fact that it is screwed "home" in the direction of the rifling, will effectually prevent the independent rotation of the sabot on the shot; but as an additional precaution the base of the projectile may be notched, as shown in the drawings, or the conical part may be roughened or serrated in like manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination of a projectile having conical base and threaded smaller portion or extension, with a sabot fitted thereto by an outer tapering part and an inner flange, substantially as and for purpose the set forth.

JOHN G. BUTLER.

Witnesses:

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