M. RITNER.

Sabot for Projectiles.

No. 35,544

Patented June 10, 1862

Fig. 1

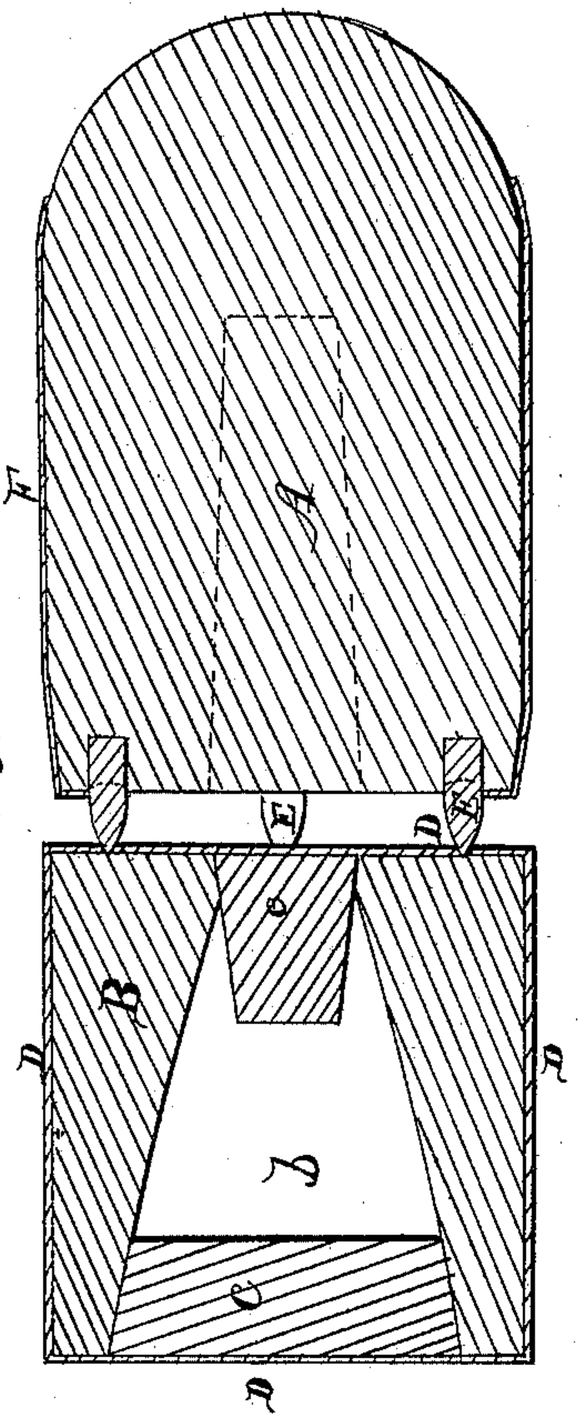
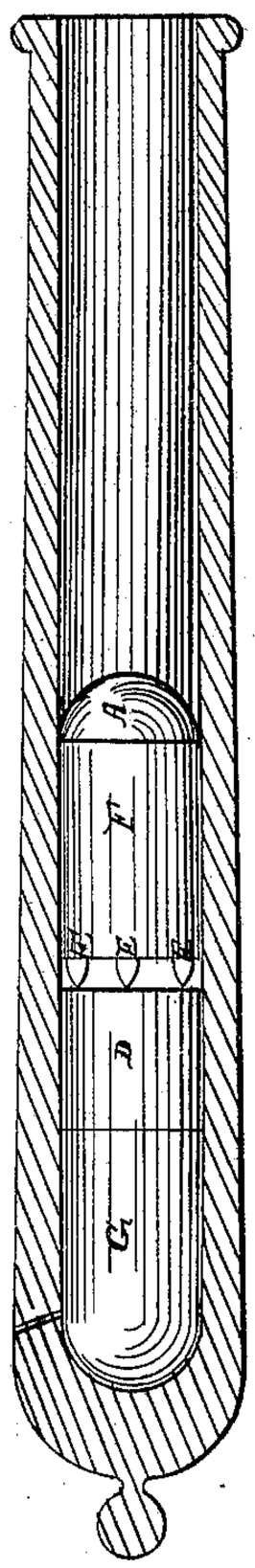


Fig. 2



Witnesses:

Ottavius Knight

J. H. Gansbaschmidt

Inventor:

M. Ritner

UNITED STATES PATENT OFFICE.

MICHAEL RITNER, OF VINCENNES, INDIANA.

IMPROVEMENT IN SABOTS FOR PROJECTILES OF RIFLED ORDNANCE.

Specification forming part of Letters Patent No. 35,544, dated June 10, 1862.

To all whom it may concern:

Be it known that I, MICHAEL RITNER, of Vincennes, in the county of Knox and State of Indiana, have invented a certain new and useful Improvement in Projectiles; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an axial section of a projectile embodying my improvement. Fig. 2 is a section on a smaller scale of a cannon, showing the projectile in position within it.

Similar letters of reference indicate corresponding parts in both figures.

My invention is especially applicable to projectiles for ordnance but may be used, also, for small-arms.

It consists in the employment of an elastic sabot of peculiar construction, applied in the rear of the ball without attachment thereto, and adapted to expand by the force of the gases, so as to close the bore and effectually prevent windage, and at the same time constitute a cushion to protect the ball from the percussive force of the explosion of the charge.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A represents an elongated ball, which I prefer to make of lead, for reasons hereinafter stated.

B is a sabot of vulcanized india-rubber. The said sabot may be made in various forms; but that represented is one which has been tested with good success. It is externally of cylindrical shape, and is formed with a central longitudinal aperture or cavity, *b*, occupying nearly the whole diameter at back, tapering toward the front, and closed at both ends with wooden plugs C *c*. The objects of the cavity *b* are to increase the elasticity of the sabot and reduce its cost. The entire sabot is enveloped in a wrapping, D, of canvas or other material.

E E represent spurs projecting from the rear face of the ball A near its circumference. The said spurs may be formed of wood, iron, or even pressed or cast out of the substance of the lead itself. Their purpose is to hold the front of the sabot from immediate contact with the back of the ball, so as to increase its yielding or "cushioning" effect, and also (if needful) to facilitate the rotation, as hereinafter explained.

F is a wrapping of canvas or other material surrounding the ball A, so as to prevent contact between the metal and the bore of the gun.

G represents the cartridge.

The manner of using and the operation of the invention are as follows: The peripheries of both ball and sabot, being completely covered with tallow and beeswax or other suitable lubricating material, are inserted in the positions shown, the charge being wholly in the rear of the sabot, and the ball is rammed home with sufficient force to compress the elastic sabot and cause it to completely fill the bore. The explosion forces the sabot in close contact with the ball, and by reason of the inertia of the latter the sabot is still further compressed longitudinally and expanded radially in all directions, effectually preventing windage. If the plug C be used, the explosion forces it forward in the tapering cavity, causing it to operate as a wedge, and thus exert a lateral pressure upon the india-rubber.

It will be apparent that the interposition of an india-rubber sabot, filling the bore between the charge and the ball, effectually protects the latter from the percussive force of the explosion, this force being received upon an elastic cushion and transmitted in a less sudden pressure to the ball. This effect is promoted by the spurs E, the force required to embed the said spurs in the substance of the rubber being communicated to the ball in the form of a gradual pressure instead of a sudden blow. A further effect of the spurs E is to so connect the sabot with the ball that any rotation which the former may acquire from the rifling of the gun will be effectually communicated to the ball. The ball, not being attached to the sabot, is free the instant it leaves the gun, and loses no force in disengaging itself. The forward plug, *c*, is not essential even with a sabot of substantially the form shown. The said plug is, however, beneficial in reducing the quantity of india-rubber required. By forming the plug *c* so that it will extend forward to the back of the ball A, and have a bearing against it, all tendency of the expanding gases to drive the said plug forward out of the sabot will be prevented, and, on the contrary, the sabot will be driven for-

ward upon the plug, the effect of which, by the conical form of the plug, will increase the lateral expansion of the sabot.

Great difficulty has been experienced in using leaden projectiles with cannon, owing to the melting or softening effect upon the sides and rear of the ball by reason of the intense heat, and likewise the cutting action of the escaping gases. This difficulty is found to be entirely obviated with my invention by the use of an india-rubber sabot adapted to completely prevent the contact of the gases with the ball. By using flannel or other woolen cloth for covering the rear end of the sabot, the latter may be effectually preserved from the melting action of the fire.

It will be apparent that the invention is not confined to the use of a sabot of the specific form shown. A sabot of cylindrical, spherical, elliptical, or other form, and either hollow or solid, may be used with good effect. It will also be evident that the invention is not necessarily restricted in its application to a leaden ball. It may be made of iron, steel, or other metal, or any compound of metals; but I prefer lead, because susceptible of a greater momentum, in consequence of its greater weight in proportion to its area or bulk. The entire avoidance of the difficulties commonly experienced in the use of leaden cannon-balls is one of the advantages of my invention.

In some cases it may be found advisable to form the ball with a central aperture at back, as indicated by the dotted red line in Fig. 1. This cavity may be filled with a plug of wood, or with plaster-of-paris poured in in a heated state, or with other material, the effect of which will be to give greater stiffness to the ball, and also reduce the proportionate weight of its rear part.

Having thus described my inventiou, what I claim therein as new, and desire to secure by Letters Patent, is—

A hollow sabot of vulcanized india-rubber, constructed substantially as described, and applied in the rear of a cannon-ball or other projectile without enveloping the same or being attached thereto, constituting a cushion to receive the percussive force of the explosion, and adapted to expand by the pressure of the gases, so as to effectually prevent their escape.

M. RITNER.

Witnesses:
OCTAVIUS KNIGHT,
C. W. STOFFORD.