C. W. SMALL.

Projectile.

No. 34,596. Patented Mar. 4, 1862.

Fig: 3.

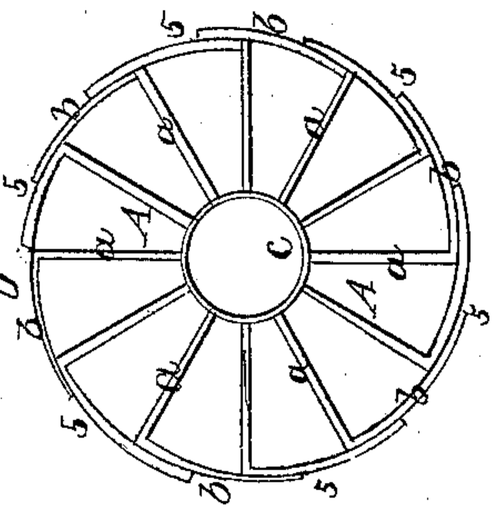


Fig: 4.

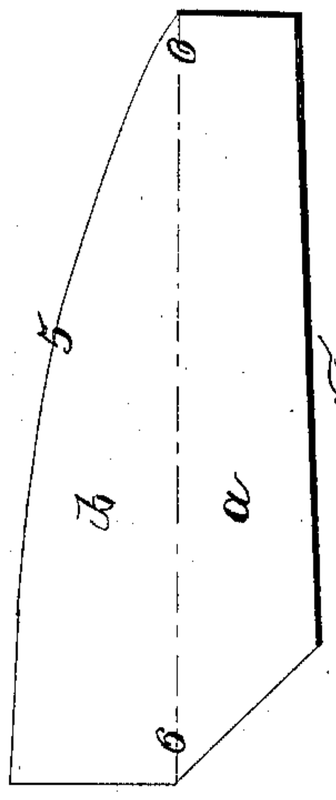


Fig: 1.

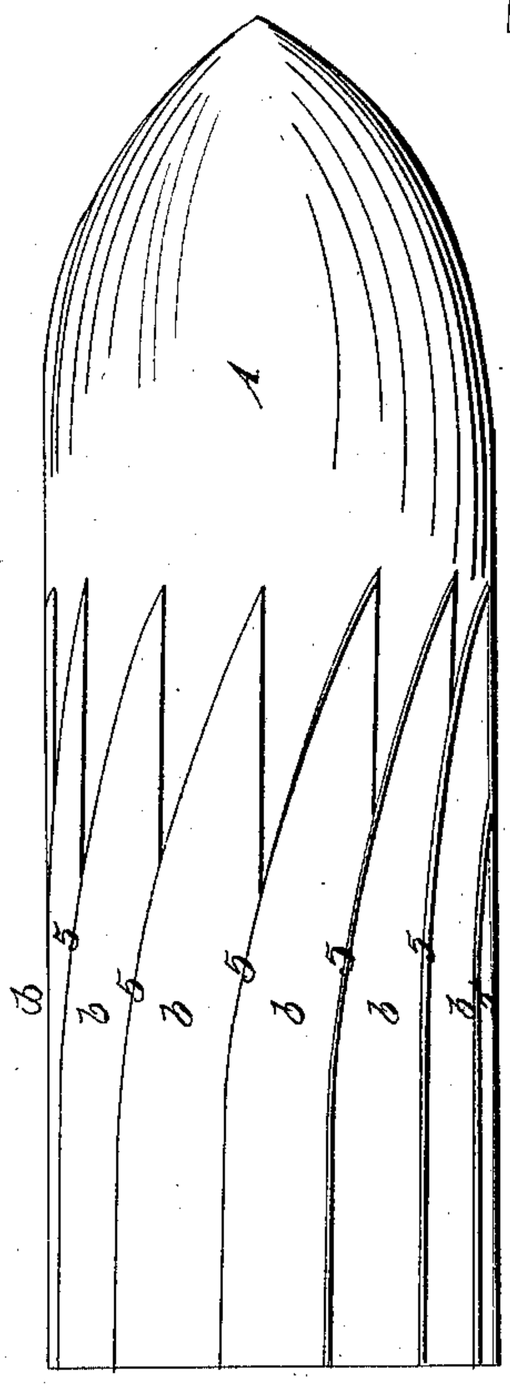
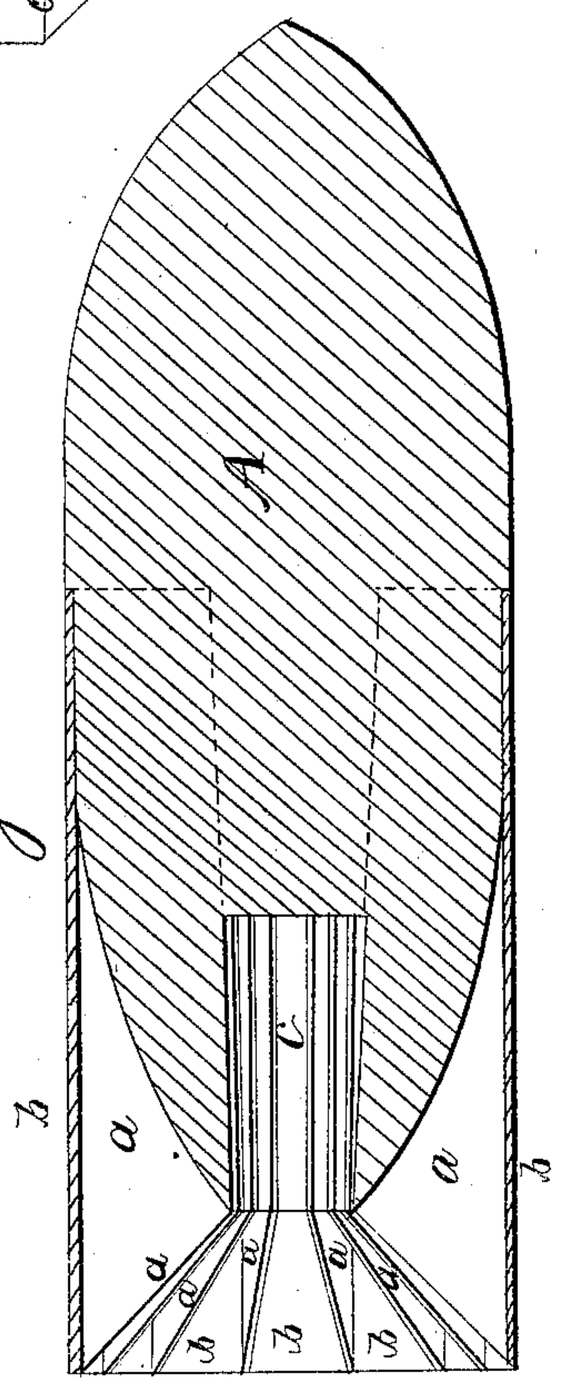


Fig: 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES W. SMALL, OF BANGOR, MAINE.

IMPROVEMENT IN PROJECTILES FOR RIFLED ORDNANCE.

Specification forming part of Letters Patent No. **34,596,** dated March 4, 1862.

To all whom it may concern:

Be it known that I, CHARLES W. SMALL, of Bangor, in the county of Penobscot and State of Maine, have invented a new and useful Improvement in Projectiles for Rifled and other Ordnance and Fire-Arms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side view of a projectile with my improvement. Fig. 2 is a central longitudinal section of the same. Fig. 3 is a rear view of the same. Fig. 4 is a side view of one of the packing-strips of flexible metal, showing its form before application to the projectile.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in furnishing an elongated projectile with a packing formed of a number of strips of wrought-iron, copper, or other tough but flexible metal or material, partly embedded in the metal of which the projectile is composed, and lapping each other on the outside of the projectile in such manner as to form around the rear thereof a tube, which is divided into sections, and capable of being expanded against the bore of the gun by means of the pressure of the gases of the gunpowder against its interior, and so made to prevent windage, and in the case of rifled guns, made to fit the rifle-grooves and obtain for the projectile a rotary motion, which is preserved, in a great degree, during the flight of the projectile by the further expansion of the sections of the tube after the discharge from the gun has taken place, and the consequent pressure of the spirally-formed edges of the said sections against the atmosphere.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

A is the body of the projectile, which may be either a solid shot or a shell, and which I prefer to make of conoidal form at its rear as well as at its front end.

a b a b are the strips of metal which constitute the packing. The inner portions, *a a*, of these strips, which are partly embedded in the body B, are arranged radially to the axis of the projectile; but the outer portions, *b b*, are bent over the body A in such manner as to overlap each other and form sections of a tube of almost perfect cylindrical form, covering the rear end of the body A. The outer edges, 5 5, of the said strips are tapered or curved in such a manner that when bent over the adjacent strips they present a spiral or nearly spiral surface.

Fig. 4 shows the form of the strip before it is bent in the line 6 to form the radial and tubular portions.

The simplest way of applying the strips *a b a b* is to place them around a core in the mold in which the body A is to be cast, before the metal of which the body is to be formed is poured therein; but this necessitates the use for the strips of a metal less fusible than that of which the body is cast, so that in a cast-iron projectile the strips should be of wrought or sheet iron. The body may, however, be cast with grooves for the reception of the strips, and the strips driven in tightly and secured by riveting or calking the inner edges, which may be presented in a hole, *c*, cored in the center of the body, as shown in Fig. 2.

The tube formed by the portions *b b* of the strips is small enough to enter the gun easily in loading. When the charge is fired, the gas resulting from its explosion presses against the several sections *b b* in such manner as to expand the tube against the bore of the gun, so that it fits closely and prevents windage, and when the gun is rifled obtains the rotary motion of the projectile. As the projectile is leaving the gun, and before the gases have escaped from it, the sections *b b* are pressed outward still more, and to some extent opened, so that they constitute wings, and their edges, being set spirally in a direction to correspond with the rifling of the gun, are caused to come in contact with the air, to aid in continuing the rotary motion of the projectile produced by the rifling of the gun.

What I claim as my invention, and desire to secure by Letters Patent, is—

Furnishing a projectile with a packing formed of strips *a b a b* of flexible metal, partly embedded in the metal of which the projectile is formed, and partly lapping each other on the exterior of the projectile in such manner as to form an expanding tube, substantially as and for the purpose herein specified.

CHARLES W. SMALL.

Witnesses:

WARREN L. ALDEN,

HENRY M. SMALL.