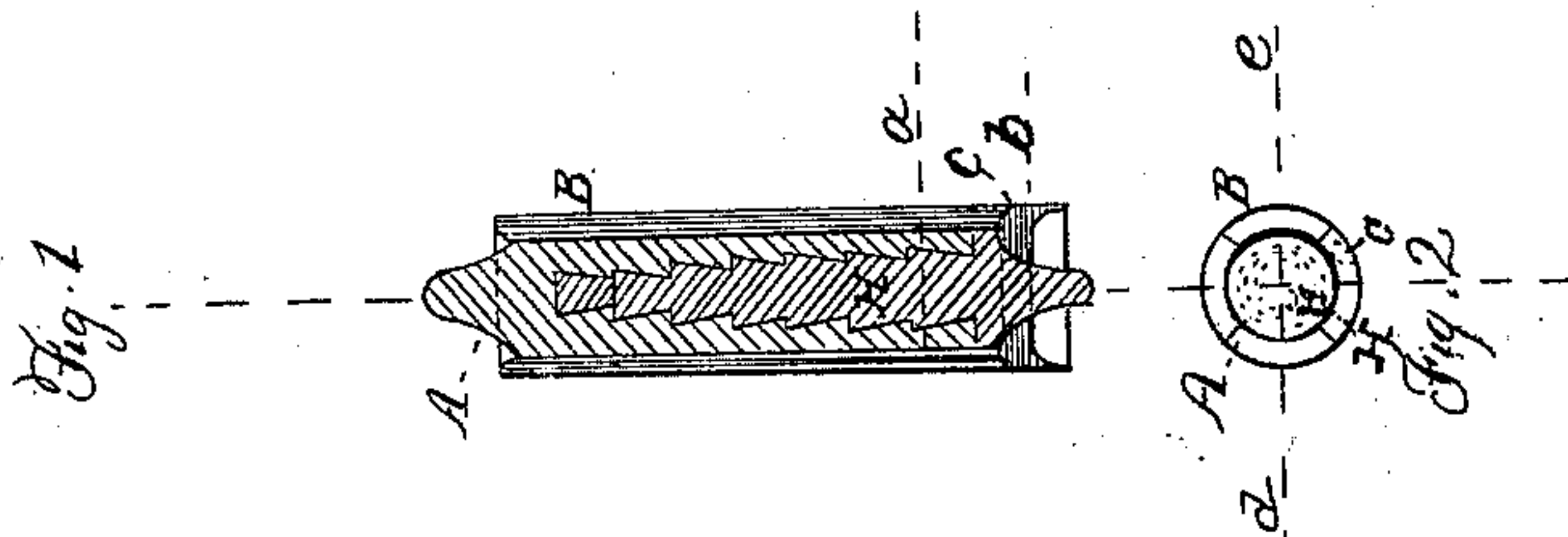


A. H. EMERY.
Projectile.

No. 37,906.

Patented March 17, 1863.



Witness { *Octavius M. Smith*
Charles Smith

A. H. Emery, C.E.

UNITED STATES PATENT OFFICE.

A. H. EMERY, OF NEW YORK, N. Y.

IMPROVEMENT IN PROJECTILES FOR FIRE-ARMS.

Specification forming part of Letters Patent No. 37,906, dated March 17, 1863.

To all whom it may concern:

Be it known that I, A. H. EMERY, a civil engineer, of No. 17 West Washington Place, in the city, county, and State of New York, have invented a new and Improved Projectile for Rifled Muskets and other Kindred Arms; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and making part of this specification, in which like letters represent like parts.

In using elongated projectiles, which have less atmospheric resistance proportional to their weight than other projectiles, it is found that when made of lead or other soft metal, if they are much elongated, they are swaged up in the gun by the pressure of the powder, which not only injures their form, but causes them to have much friction on the sides of the gun.

The nature of my invention consists in providing those projectiles which are made of lead or other soft metal or metals with a hard metallic stay at the rear end, passing along the center of this end and through the middle of the projectile toward the front end, for the purpose of preventing the rear end of the projectile from being swaged up by the pressure of the powder when it is fired, and also for the purpose of throwing the center of gravity of the projectile ahead of the center of the volume of the same, the density of the stay being less than that of the body of the projectile, thereby lessening its tendency to rotate about any transverse axis.

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

One of my elongated projectiles is shown in Figures 1 and 2, in which Fig. 1 is a longitudinal section, made by the cutting plane passing through the line *d e* in Fig. 2, which is a plan or end view of the shot complete.

In these figures, A is the soft body of the projectile, which surrounds H, which is the harder metallic stay forming the rear and center of the shot. The stay-piece H is usually made of iron, and by being pointed in the rear lessens the atmospheric resistance to the passage of the shot. It also has shoulders along

on its sides, which sustain the metal forming the soft body of the shot when it is fired from the gun, so that it does not swage up, but retains its present form. If the stay-piece H does not have shoulders or projections on its sides, then it must be tinned, so that the metal forming the body of the shot around it shall adhere to it when the shot is cast. The stay-piece H is usually made of cast-iron, but may be made of wrought or malleable iron, or any other metal which is sufficiently hard to answer the purpose.

When lead is used for the body of the shot A and iron is used for the stay-piece H, the center of gravity of the mass is then in front of the center of volume, as lead is much more dense than iron, and the shot is therefore more likely to keep point on than when otherwise constructed. A stout metal band of harder, stronger metal than the body of the shot might be put around the body to prevent its swaging up, but is not as good for several reasons.

To throw this projectile with great velocity, it is fired from a gun having a much larger caliber than the shot has. The shot is kept in the center of the bore by the guide-band B, made of paper or other light material, and receives the pressure of the powder from the whole section of the bore by means of the sabot C, which also rifles it, the rear of the sabot being pressed into the grooves of the gun. As soon as the projectile leaves the gun the guide-band B and sabot C leave it, owing to their superior atmospheric resistance. The sabot C does not require to be fastened to the shot, in order to rifle it, as the pressure of the powder will hold them so tightly together that the shot will receive the same rotary motion from the sabot C that the latter does from the grooves of the gun.

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

The construction and arrangement of the hard metallic stay H, with the soft body of the shot A, essentially as and for the purposes herein described and set forth.

A. H. EMERY.

Witnesses:

OCTAVIUS KNIGHT,
CHARLES SMITH.