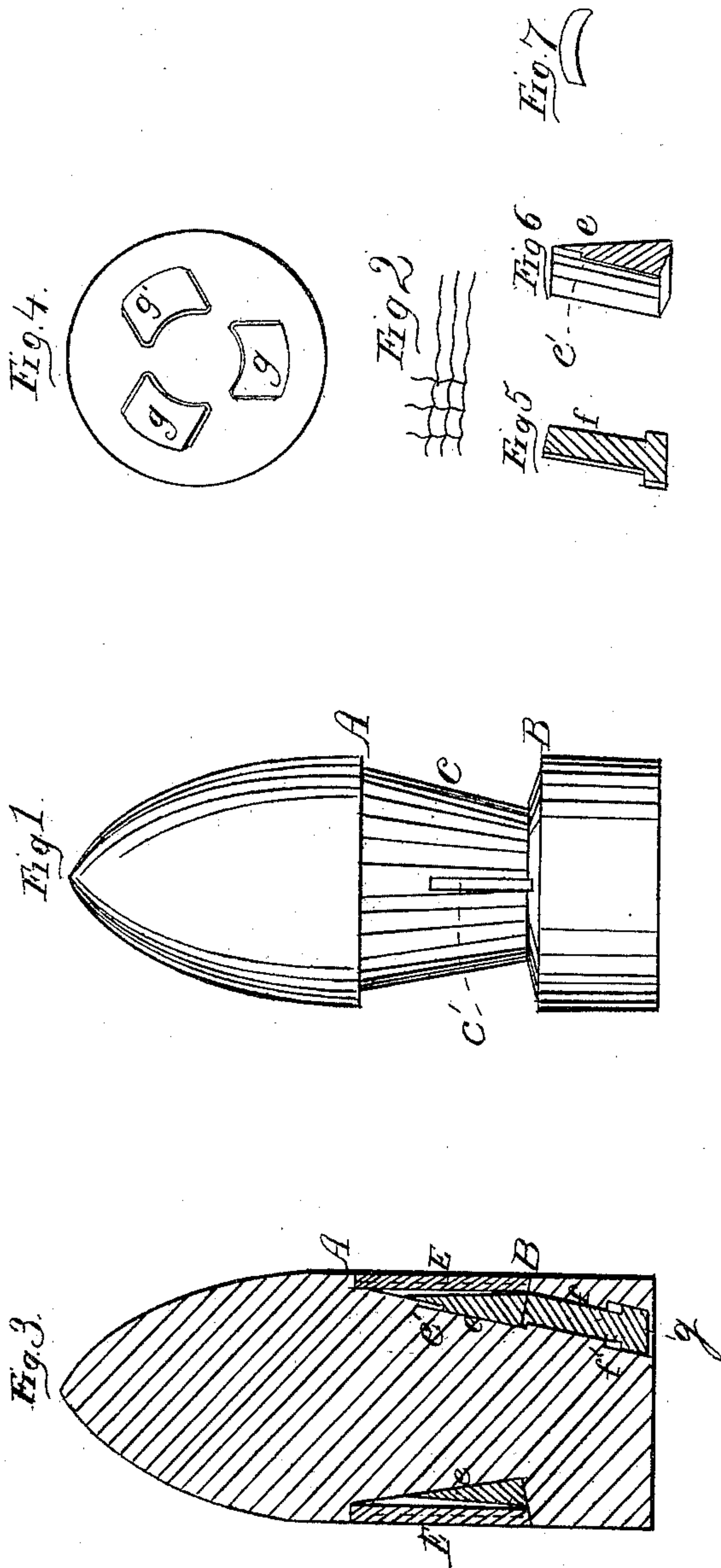


J. B. ATWATER.
Projectile.

No. 37,891.

Patented March 17, 1863.



Witnesses
Charles H. Rice and
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UNITED STATES PATENT OFFICE.

J. B. ATWATER, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN PROJECTILES FOR RIFLED ORDNANCE.

Specification forming part of Letters Patent No. 37,891, dated March 17, 1863.

To all whom it may concern:

Be it known that I, JOHN B. ATWATER, of Chicago, in the State of Illinois, have invented certain new and useful Improvements in Projectiles; and I hereby declare that the following is a true and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 represents the body of my projectile, which is cast in one piece with grooves to receive the flanges of the wedges, and with openings through the base to admit the plungers. Fig. 2 is a view of the wire web. Fig. 3 is a longitudinal section of the projectile, showing the wire-cloth, the lead belt, and the wedge and plunger. Fig. 4 is an end view of the base of the projectile. Fig. 5 is a side view or section of the plunger. Fig. 6 is a perspective view of one of the wedges. Fig. 7 is an end view of one.

Between A and B there is a depression, (marked C,) the depth of which varies according to the size of the projectile. This depression increases from the shoulder at A to the shoulder at B. The slope *c* is surrounded or embraced by three wedges, (marked *e*,) corresponding in number to the openings made to receive them. The wedges run lengthwise of C, and, commencing at the shoulder B, they end in a feather-edge at reaching two-thirds of the distance between B and A. The wedges *e* have projections at the bottom, which play in grooves *c'*, cast in C, and, beginning at the base of *e*, extend two-thirds of the length, as at *e'*. In the openings made to receive the plungers there are shoulders formed half an inch (more or less) from the point B toward the base of the projectile, which are intended to arrest the plungers *f* when they have performed their office. The heads of *f*, being larger than their stems, are formed to rest against the shoulders, as above described.

E represents the lead belt, or rather a section of it, which surrounds the wedges *e* and keeps them in position. This belt is formed in the following manner: The wedges are arranged in their proper places, and then surrounded by the wire-cloth corrugated in manufacture for this purpose, the two edges overlapping each other, and secured by the wires

at one end being hooked into and fastened into the meshes of the other end. The body of the projectile thus arranged is put into a mold. Molten lead is poured into the space between A and B through an opening made in the mold. The lead passes through the meshes of the wire sufficiently, so that the wire-cloth is completely embedded and forms a solid belt of metal around the wedges. The importance of the corrugated wire-cloth, or its only equivalent, a perforated corrugated metallic band, which is embedded in the lead belt, is that, when the wedges act upon the belt and cause it to expand, the lead is not driven through the meshes of the wire, but such action serves to straighten the wire without severing it, thereby allowing the expansion of the entire belt and preserving its full strength intact, while in the case of the single coil of wire heretofore used, when the act of expansion takes place, the expansion being so instantaneous, the wire is broken or remains fixed, and in the latter case the lead is driven out and cut by the wire into as many rings as there are coils of wire embedded within the belt. In my improvement, although the lead on the outside of the wire-cloth or perforated band may be broken, yet by reason that the inner and outer portion is held by the riveting obtained through the meshes of the wire-cloth or perforations of the band, it is thought impossible (from experiments that have been had) for the lead to be thrown from the projectile during its flight in the air.

The operation of the different parts of my projectile is as follows: The moment the gun is discharged the gases, acting on the base of the plungers, drive them forward against the wedges. The wedges are arrested in their progress at the instant the shoulders *e'* of the projections reach the shoulders in the grooves *c'*. At the same moment the plungers are arrested by the shoulders in the openings *f'*, as in Fig. 3, above described. The wedges as they are forced forward expand the belt by their upward pressure and force the lead into the rifles of the gun. When this object is attained, no further expansion of the lead can take place. The upward pressure ceases at the time the projections of the wedges are arrested by the shoulders of the grooves.

In using my projectile, the plungers may on some occasions be dispensed with and the gases suffered to act directly on the base of the wedges.

I am aware that projectiles have been used where the gases have been suffered to act directly upon the lead belt without check or limitation; but experience has proved that this arrangement is so completely destructive of the belt that it is thrown from the projectile immediately upon its leaving the chamber of the gun. In the construction of my projectile, after the plungers are placed, in order to secure them against dropping out during transportation or during the flight of the projectile after it has been fired, I hammer down the edges of the openings.

I disclaim the use of the single wire coiled within the lead belt; but,

Having thus described my invention, what I do claim, and desire to secure by Letters Patent, is—

1. The corrugated wire web or cloth, or its specified equivalent, for the purpose herein described.

2. The combination, with the wire-cloth and lead band, the tongued wedges and flanged plungers, arranged in the manner substantially as described.

J. B. ATWATER.

Witnesses:

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