2 Sheets—Sheet 1.

A. J. S. MOLINARD.

Projectile.

No. 47,213. Patented Apr. 11, 1865.

Fig. 1.

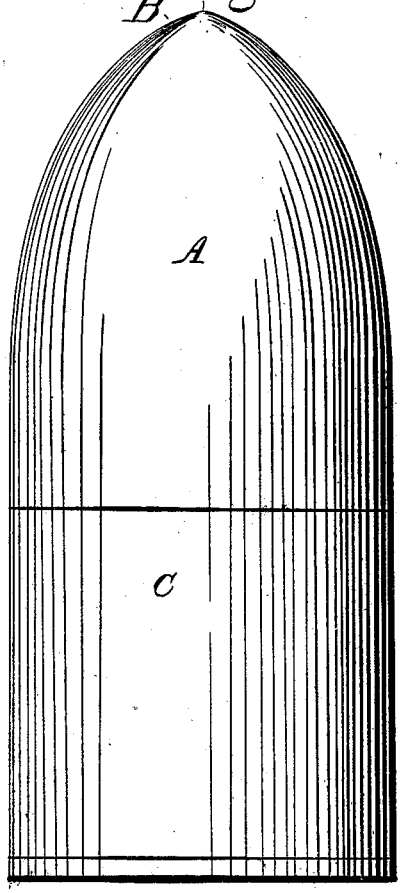
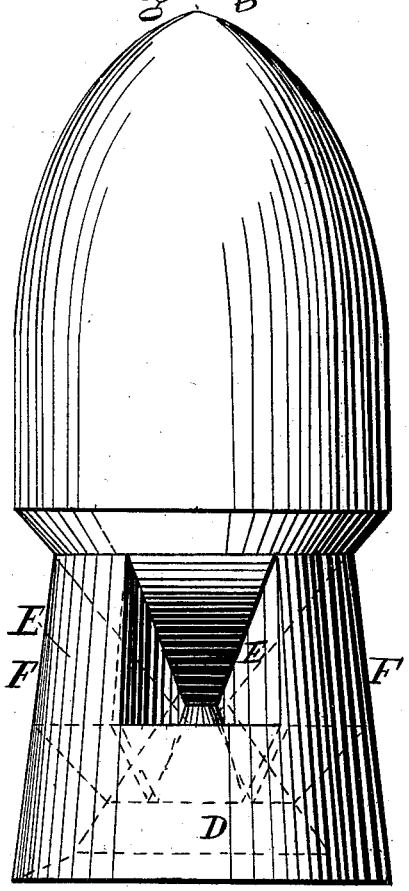


Fig. 2.



Witnesses

Jno D Patton
A Moore

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Albert J S Molinard
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2 Sheets—Sheet 2.

A. J. S MOLINARD.

Projectile.

No. 47,213. Patented Apr. 11. 1865.

Fig 5

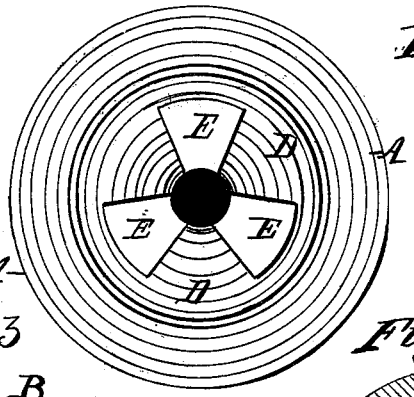


Fig 3

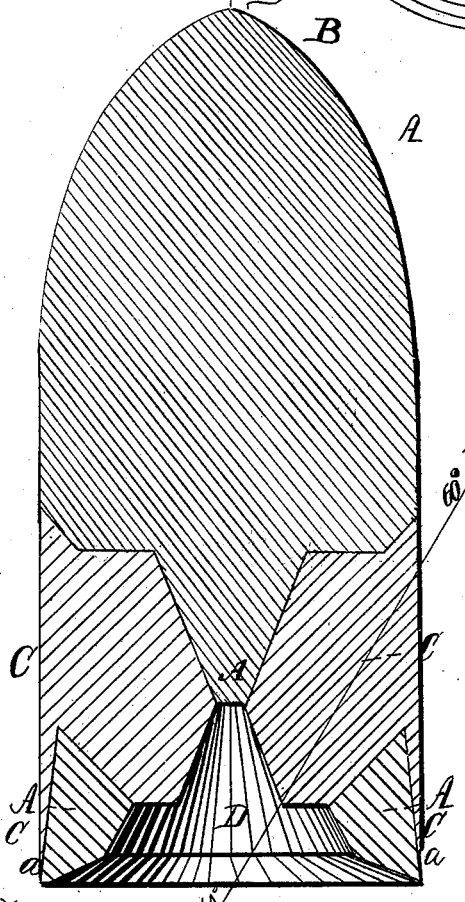
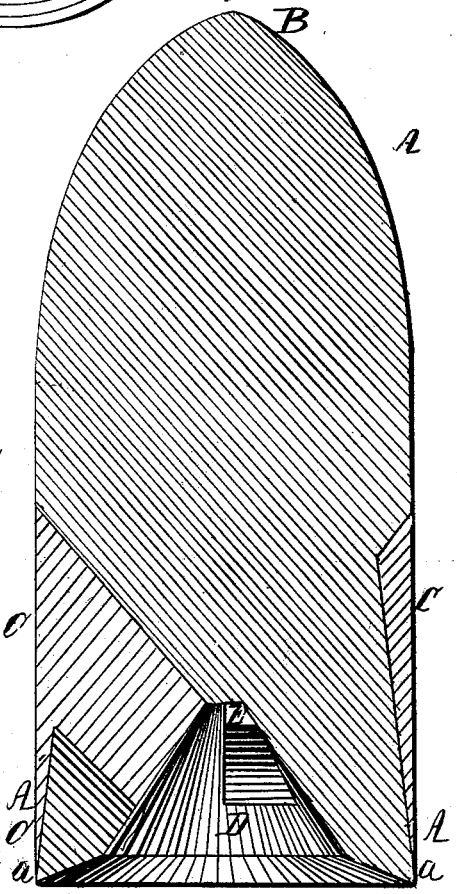


Fig 4



Witnesses

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UNITED STATES PATENT OFFICE.

ALBERT J. S. MOLINARD, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN PACKING PROJECTILES FOR RIFLED ORDNANCE.

Specification forming part of Letters Patent No. **47,213**, dated April 11, 1865.

To all whom it may concern:

Be it known that I, ALBERT J. S. MOLINARD, late of the United States Army, now residing in the city of Baltimore and State of Maryland, have invented certain new and useful Improvements in Projectiles for Rifled or other Ordnance; and I do hereby declare the following to be 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 represents an external view of the projectile complete and ready for use. Fig. 2 represents the external appearance of the cast projectile before it receives its soft-metal packing. Fig. 3 represents a section through the projectile, to show the greatest amount of lead or other metal packing at, in, or around its base or rear portion. Fig. 4 represents another section, so taken as to show the greatest amount of solid metal in the projectile at, in, or around its base or rear portion. Fig. 5 represents a view from the rear of the projectile.

Similar letters of reference, where they occur in the several separate figures, denote like parts of the projectile in all the drawings.

I am aware that a band or packing of lead and other soft metal has been put in and around a projectile, so as to be driven by the force of the explosion of the charge into the grooves or against the bore of the gun, to destroy windage; and I am also aware that means have been essayed and patents granted for devices for preventing this metallic packing from flying off or leaving the projectile; but in none of these, so far as I have knowledge, have the desired results been obtained, for, though provision has been attempted to be made to prevent the centrifugal force of the shot or projectile from throwing off its packing, yet in practice it is thrown off, and with great danger and frequent accident to those in proximity to the gun.

My invention has for its object the forcing of the soft-metal packing into the grooves or against the bore of the gun by upsetting, as it were, the bulk of the packing from the interior, and raising the thin feathered or tapered edge of the packing at the heel of the projectile by the force of the explosive gases of the charge, and the so uniting of the packing with the body of the projectile as to counteract the centrifugal force by a superior force—viz., the projectile force—and thus prevent the packing from flying off or leaving the projectile; and the nature of my invention consists in the inclination or projection of the openings that lead from the hollow portion of the base of the shot (and into which the packing is cast or poured) toward the point from the rear of the projectile, so that the packing, to leave the body of the shot, would have to move forward on the shot to clear the openings in which it is contained—an impossibility, as it presupposes the centrifugal to be superior to the projectile force of the shot in its flight—and so shaping the rear portion of the shot or projectile as that the packing may taper down to a thin feathered edge near or at the base of the shot, under which the gas may drive and act, in conjunction with the explosive force of the charge, against the solid lead, to force or raise it into the grooves or against the bore of the gun.

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

The body of the shot, A, is cylindrical, and has a conical point, B, and without any projections to fit the grooves of the gun, though such may be used, if found necessary. The rear of the shot, C, is of the same diameter as the body, the packing being received in a recess or recesses, so as not to project beyond the body A.

In Fig. 2 the external shape of the cast shot previous to the applying of the soft-metal packing is distinctly seen. The base of the shot has a conical opening, D, in it, extending far enough into the shot so that openings E, communicating therewith, may extend to and through the neck portion F to its perimeter. These openings E project in a forward direction, and incline at about an angle of sixty degrees to the axis of the conical opening at the base or heel of the shot.

In Figs. 3 and 4, A represents the metal of which the shot is made, and C represents the lead or other soft-metal packing run in its openings. Toward or at the base of the projectile, as seen at *a a*, Figs. 3 and 4, the packing runs out to a thin edge, and this thin edge is raised and forced into the grooves or against the bore of the gun by the force of the exploded charge acting on the lead in the coni-

cal hole, thus enabling sufficient gas to get under this portion to so force it out. The packing C, to leave the openings in the projectile into which it is poured, would have to move in the direction of the red line *b b*, Fig. 3, which line forms an angle of sixty degrees with the axis of the conical opening D or axis of the projectile, and to move through this line the packing would have to move faster than the projectile or forward motion of the shot itself, which faster motion, of course, it could not acquire in any known way. The inclination of these openings into which the soft-metal packing is placed, it is believed, will entirely counteract the centrifugal force that the projectile may have, by its packing being driven into the grooves of the gun, and thus ejected from the gun.

Having thus fully described the nature, object, and purpose of my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The inclination of the mortises or openings E, connecting the conical hole in the base with the outer belt of metal or packing.

2. In combination with the soft-metal packing united to the shot, as herein described, and the tapering of said packing to a thin feathered edge at or near the base of the shot, that is raised by the gases acting simultaneously against the solid lead at the base and feather edge at the time of the discharge, for the purpose set forth.

AL. J. S. MOLINARD.

Witnesses:
L. R. WOOLLEN,
W. H. HAYWARD.