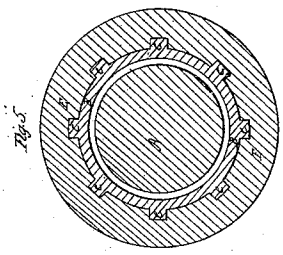
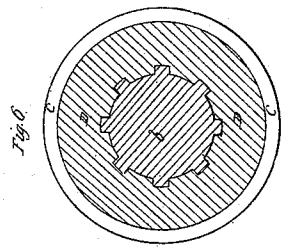
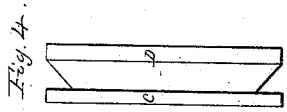
W. H. SMITH.

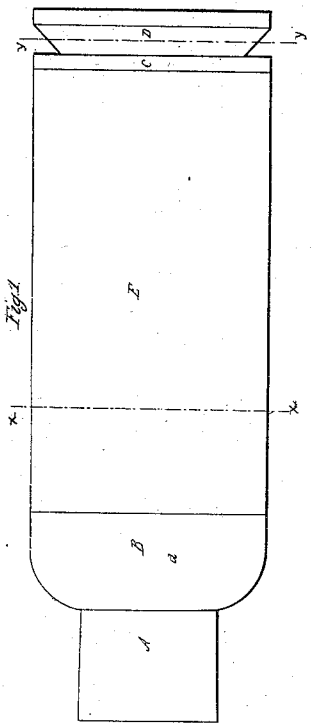
PROJECTILE FOR RIFLED ORDNANCE.

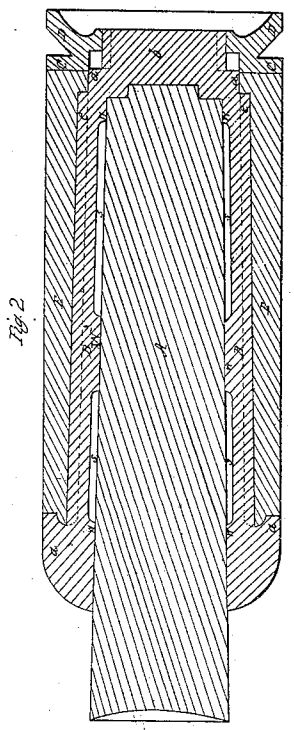
No. 41,127. Patented Jan. 5, 1864.

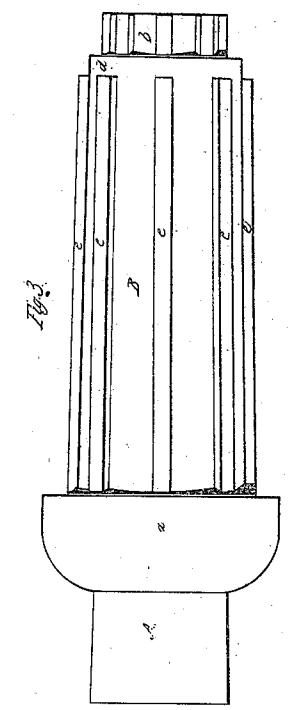












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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILSON H. SMITH, OF BIRMINGHAM, CONNECTICUT, ASSIGNOR TO HIMSELF, R. M. BASSETT, AND CHAS. D. GIBSON.

IMPROVEMENT IN PROJECTILES FOR RIFLED ORDNANCE.

Specification forming part of Letters Patent No. 41,127, dated January 5, 1864.

To all whom it may concern:

Be it known that I, WILSON H. SMITH, of Birmingham, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Projectiles for Ordnance; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and of which—

Figure 1 is a side elevation of my improved sub-caliber projectile; Fig. 2, a central longitudinal section of the same; Fig. 3, a side elevation of the projectile when fitted with its metallic jacket alone, Fig. 4 representing the end packing disk and ring detached from the other parts of the casing. Fig. 5 is a transverse section of the projectile in the line *x x* of Fig. 1, and Fig. 6 a similar section of the end cap and packing-ring in the line *y y* of Fig. 1.

Similar letters indicate like parts in each of the drawings.

The nature of my invention consists in the manufacture and use of a new and improved combination-casing in connection with a sub-caliber shot or shell, to obviate the danger which has heretofore been experienced in the use of such projectiles, because of the liability of the casing to break within the gun when acted upon by the explosion of the charge therein.

The sub-caliber projectile A represented in the accompanying drawings is formed of a simple solid, steel-headed, cutting-faced bolt, tapering in form, to facilitate the detachment of its casing after the projectile has left the gun. I contemplate, however, the application of my improved form of casing to any description of sub-caliber projectiles.

My improved casing consists of a light metallic jacket, B, Figs. 2 and 3, combined with an exterior coating, E, of a soft texture, tenacious in fiber and quality, and fitted with an end cap or disk, C, which is to a certain degree movable. The metallic jacket B, Figs. 2 and 3, is cast hollow, leaving annular recesses *s s*, Fig. 2, therein, separated by annular projections formed upon its interior surface at either end, and in or about the center thereof. These annular projections *w w w*, Fig. 2, are turned so as to fit and embrace closely and accurately the tapering bolt A, placed within the jacket, and serve to center it exactly upon the axis thereof. The extreme inner or rear end or base of the jacket B is mortised to receive an angular projection or tenon upon the rear end of the bolt A, whereby the rotary movement imparted to the projectile in its discharge from a rifled gun is communicated to this central bolt. The exterior form of this metallic jacket B is peculiar, and is fully illustrated by Fig. 3 of the accompanying drawings. Its front end is shaped into a ring or annular projection, *a*, which coincides in diameter with the bore of the gun, (its outer periphery being turned accurately to fit the same,) and serves to center the front end of the bolt therein. That portion of the jacket in the rear of the bearing-ring *a* tapers gradually in a degree coincident with the taper of the bolt to be inclosed therein, so that their outlines in section are parallel, as illustrated in Fig. 2. A grooved projection, *b*, Figs. 2, 3, and 6, is formed upon the base or rear end of the jacket B, to receive and properly secure an annular supporting plate or disk, C, Figs. 2, 4, and 6. The outer surface of the jacket is also furnished with a series of longitudinal ribs, *e e e*, Figs. 3 and 5, which commence immediately behind the front bearing, *a*, and extend back to within a short distance of the end of the jacket, adding greatly to the strength of the whole casing, and securing a more perfect combination of the exterior envelope. The rear supporting-disk, C, is provided with a central opening, so formed as to receive and embrace closely and accurately the grooved projection *b* upon the end of the jacket. An annular central recess is also turned upon its front face, with a diameter very slightly larger than the rear end, *d*, of the jacket, so that it may pass over and slide forward upon the same against the ends of the ribs *e e e e e*. The periphery of this supporting plate or disk C is turned to fit the bore of the gun, so as to center the rear end of the projectile accurately therein, and it is also provided with a suitable packing ring or flange, D, Figs. 2 and 4, of soft metal, combined with the usual lubricant materials. Upon this light metallic jacket B, formed as described, I superimpose an exterior casing, E, Figs. 2 and 5, of paper or papier-maché, felt, leather, hemp, flax, cotton, lithoconia, india-rubber, gutta-percha, or other equivalent soft but tenacious material. This

casing extends rearwardly beyond the end of the ribs to the extreme end of the jacket, so that the supporting-disk C, when placed upon the grooved projection *b*, (see Fig. 3,) is prevented thereby from slipping forward upon the end *d* of the jacket against the ends of the ribs *e e e*, until forcibly driven on by the explosion of the charge in the gun.

The exterior casing, E, may be molded upon the ribbed jacket B, or pressed on in rings or sections, as may be found most convenient in view of the material used. Its perimeter is made equal and uniform with those of the supporting-ring *a* and disk C, as seen in Fig. 2; but it will be observed that when the projectile is started in the gun by the force of the explosion of the charge of powder, the supporting-disk C (with its attached packing ring or flange D) is driven forward upon the end of the jacket at *d*, (see Fig. 2,) until it strikes against the ends of the ribs *e e*, and by thus compressing the exterior casing, E, causes it to expand radially into the grooves of the gun.

The ribbed jacket B may be cast at one operation either of malleable iron (which I prefer) or of any other metal or metallic composition or alloy found sufficiently strong and tenacious in quality and fiber.

I do not limit myself to a ribbed metallic jacket in this connection, for, although I believe these ribs to be an important feature of my invention, I do not regard them as positively essential to its success.

The advantages of my improved combination casing are evident, being found in its superior strength, combined with lightness, and in the facility with which it detaches itself from the inclosed bolt when the projectile has left the gun.

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

1. My improved casing for sub-caliber projectiles, consisting of a light metallic jacket, B, combined with a movable supporting-disk, C, and an exterior envelope, E, of paper, papier-maché, leather, rubber, gutta-percha, cotton, lithoconia, hemp, or other similar and equivalent soft, plastic, fibrous, or elastic materials, either singly or in their combinations, the whole being united and arranged substantially in the manner and for the purpose herein set forth.

2. The combination of my improved casing, as described, with any suitable form of sub-caliber projectile for ordnance, substantially as is herein set forth.

The foregoing specification of my new and useful improvement in sub-caliber projectiles for ordnance signed by me this 6th day of October, A. D. 1863.

WILSON H. SMITH.

In presence of—
GEO. W. STEVENS,
THOS. S. BIRDSEYE.