W. E. BROWNE.

Shell.

No. 35,503. Patented June 10, 1862.

Fig: 1.

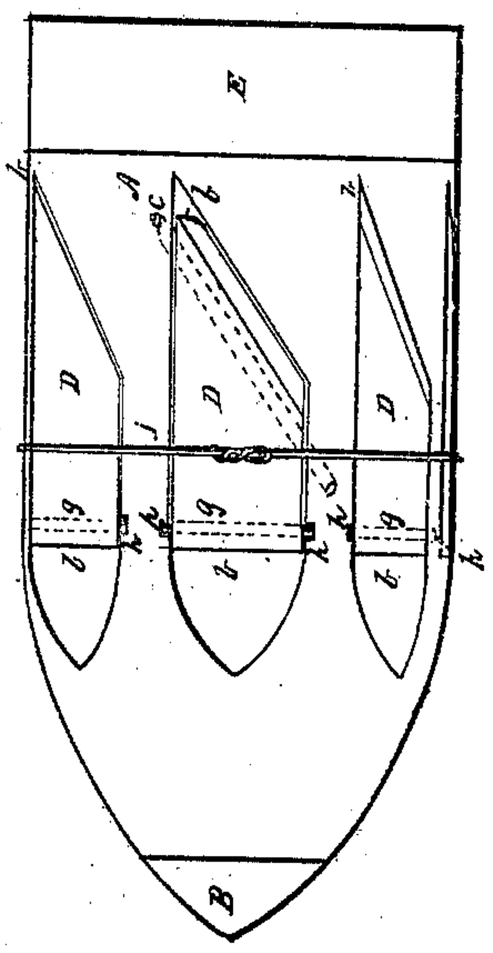


Fig: 3.

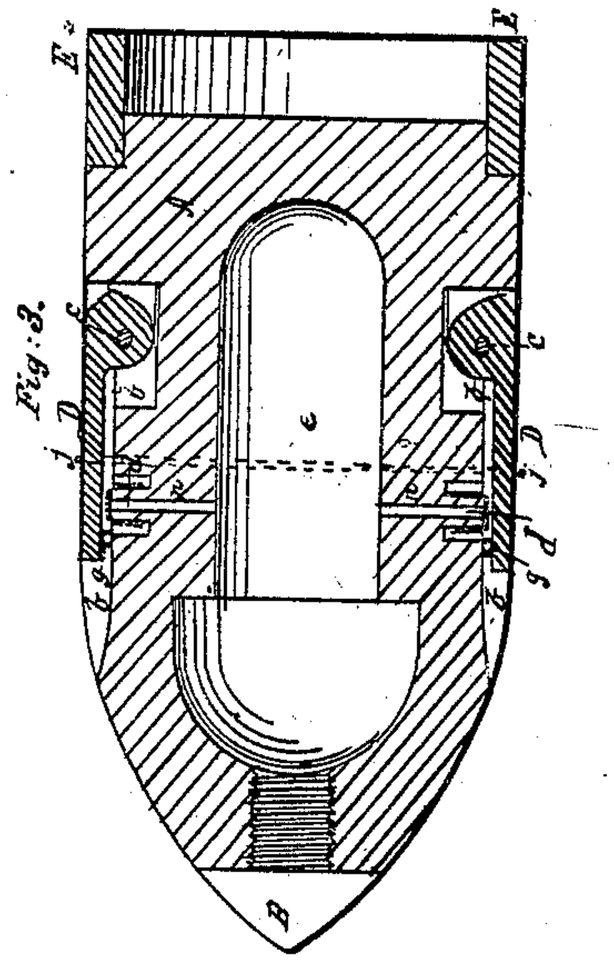
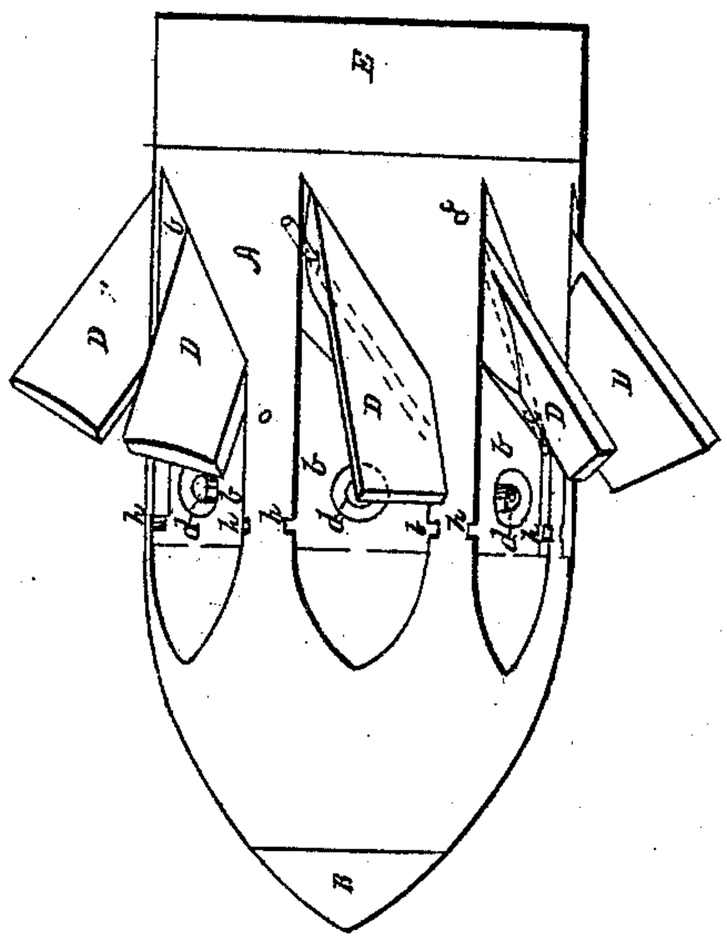


Fig: 2.



Witnesses
J. W. Coombs
James Laird

Inventor
W. E. Browne
per Munn & Co
Attorneys

UNITED STATES PATENT OFFICE.

W. E. BROWNE, OF VALLEY FALLS, RHODE ISLAND.

IMPROVEMENT IN EXPLOSIVE PROJECTILES FOR ORDNANCE.

Specification forming part of Letters Patent No. **35,503**, dated June 10, 186 .

To all whom it may concern:

Be it known that I, WILLIAM E. BROWNE, of Valley Falls, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Elongated Projectiles for Ordnance; 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, forming part of this specification, in which—

Figure 1 is a side view of an elongated explosive projectile with my improvement, showing it in condition for transportation. Fig. 2 is a similar view of the same, showing the projectile in the condition it assumes on its discharge from the gun. Fig. 3 is a central longitudinal section of the same, corresponding with Fig. 1.

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

This invention consists, first, in a certain arrangement of obliquely-expanding wings for the purpose of obtaining a rotary motion of a projectile about its axis by the resistance of the atmosphere to its flight when fired from a smooth-bored gun.

It consists, secondly, in a certain mode of combining one or more expanding wings and a nipple or nipples, or their equivalents, for the reception of percussion-caps or other percussion priming in an explosive projectile, for the purpose of making such wing or wings constitute a hammer or hammers by which the said priming is exploded on the projectile striking.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A is the body of the projectile, made with an opening at its point, as shown, or at its base, for the introduction of the charge, and fitted with a screw-plug, B, to close it after being charged.

b b are recesses formed at equal distances apart all around the exterior of the body A, for the reception of the expanding wings D D, said recesses having their sides parallel with the axis of the projectile, as shown, or oblique thereto. The said wings D D are attached at their rear ends to the body A by means of pins *c c*, inserted through them and through the portions of the body at the sides of their respective recesses *b b*, at an angle of about forty-five degrees to planes passing longitudinally through the axis of the projectile, and the rear ends of the said wings are made parallel with the said pins, to enable them to swing outward by a movement upon the said pins in the manner shown in Fig. 2. The rear ends of the recesses *b b* are also made parallel with the said pins. The exterior surfaces of the wings are so formed that when closed up into the recesses *b b* their exterior surfaces are flush with the exterior surface of the body A. In one or more of the recesses *b b* or in each one there is provided a nipple, *d*, with a vent, *n*, to the central cavity, *e*, which contains the charge of gunpowder to effect the disruption of the body A of the projectile, and a percussion-cap, *f*, or other percussion priming is applied to each nipple, and under the front portion of each wing there is placed a stop, *g*, composed of a piece of wire, which is arranged across the cavity *b*, with its ends resting in notches *h h*, provided in the body A, on each side of the recess *b*, for its reception, such stops being for the purpose of keeping the wings out of contact with the caps or other priming during the transportation of the projectile. These pins are kept in place until the projectile is placed in the gun, by means of a band, *j*, of wire or other material, encircling the body of the projectile around the wings D D and confining the said wings within their recesses *b b*.

E is a packing-band of soft metal, applied round the base of the projectile to be expanded by the gases developed in the explosion of the charge of the gun, for the purpose of preventing windage.

The projectile, charged and capped, and with the stops *g g* and band *j j* applied, may be transported and handled with perfect safety. When it is to be inserted in the gun, the band *j* is slipped off, and the stops *g g* may be allowed to drop out of their places and from the projectile, which is inserted into the gun in the same manner as any other projectile. When the discharge of the gun takes place on the projectile leaving the gun, the wings D are caused by their inertia to fly out from the body A in the manner shown in Fig. 2, in which condition they are retained by the pressure of the air in front of them during the flight of the projectile, and in which condition, owing to the spiral or nearly spiral arrangement of their faces or inner sides relatively to the axis of

the projectile, the resistance of the atmosphere, acting against the said faces or sides, causes the rotation of the projectile on its axis. On the striking of the projectile against any body having sufficient resisting-power to stop or considerably retard the body A, the wings, continuing to move forward by the momentum they have acquired, are caused to strike like hammers upon the percussion-caps *f f*, which are thereby exploded and caused to fire the charge in the cavity *e* and produce the disruption of the body A.

I do not claim, broadly, furnishing a projectile with wings which fly out from the body and assume a spiral relation thereto in the flight of the projectile; but

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

1. The arrangement of the expanding wings D D to swing from recesses in the sides of the body of the projectile upon pins *c c*, arranged obliquely to planes passing through the axis of the projectile, substantially as and for the purpose herein set forth.

2. The combination of one or more expanding wings, D D, attached to the body of the projectile, and one or more nipples or their equivalents provided on the said body for the reception of percussion-caps or other percussion priming, whereby the said wings are made to constitute hammers for the explosion of the percussion priming, substantially as herein specified.

W. E. BROWNE.

Witnesses:
VINCENT BROWN,
WILLIAM SPINK.