(No Model.)

C. G. OTIS.

EXPLOSIVE PROJECTILE.

No. 356,396. Patented Jan. 18, 1887.

Fig. 1.

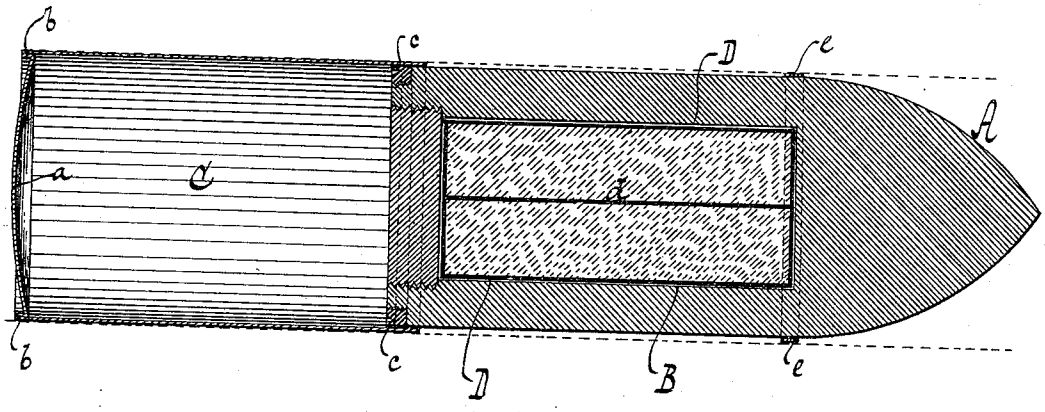
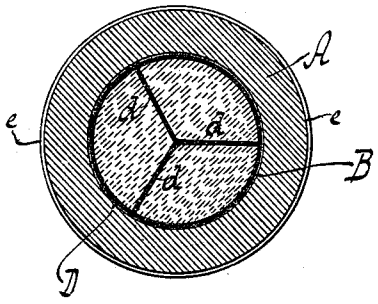


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES G. OTIS, OF BROOKLYN, NEW YORK.

EXPLOSIVE PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 356,396, dated January 18, 1887.

Application filed September 10, 1886. Serial No. 213,233. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. OTIS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Explosive Projectiles, of which the following is a specification.

The object of this invention is to provide a novel explosive projectile which when fired will not explode prematurely from the shock imparted to it by the explosion of the charge in the gun or cannon from which said projectile is fired.

To such end my invention consists in the features and construction of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a longitudinal section of my projectile. Fig. 2 is a cross-section of the same.

In the drawings, the letter A designates the outer shell or body of my projectile, in which is formed a chamber, B, filled with the explosive.

C is a tubular cap, closed at one end by a head, *a*, which fits closely over the tail end of the projectile. Before the projectile is inserted into the gun this cap is passed over the tail end of the projectile, as shown in Fig. 1, and then the projectile, together with the cap, is so placed in the gun that the head *a* of the cap C rests against the charge.

As the charge in the gun or cannon explodes the cap C will be driven forward over the body of the projectile, thereby compressing the air between the head *a* and the tail end of the same, forming an elastic cushion behind the latter and imparting to it gradually and without shock the force developed by the explosion of the charge in the gun. By this method a projectile charged in the ordinary way with a high explosive may be fired from a gun or cannon without danger of premature explosion from shock.

If the projectile is to be fired from a rifled cannon, the cap C is provided at its rear end with a flange, *b*, which will be expanded and driven into the rifle-grooves by the explosion of the charge behind the same, while the compressed air in the cap will impart a similar tendency to a similar flange, *c*, with which projectiles for rifled cannon are usually provided, so that both the cap and the projectile will be rotated together as they are fired from the gun, while at the same time the expanding flange on the projectile will form an air-tight joint between it and the cap C.

As the projectile is caused to revolve on its own axis when it is fired from a rifled cannon, it will be found necessary that the explosive charge contained in it be firmly secured in the chamber B, so as to revolve with it and prevent the generation of heat by friction between the charge and the body of the projectile. This I accomplish by dividing up the chamber B by means of partitions or projections *d;* or when the explosive is contained in a canister, D, as shown in the drawings, I secure the canister firmly in the chamber B and divide up its interior by partitions or projections, as above indicated.

To insure a proper position for the projectile in the cannon, a narrow ring, *e*, is secured around its forward end, thereby insuring the coincidence of the axes of the projectile and the bore of the cannon.

The head *a* of the cap C is made convex on its outer face, as shown in Fig. 1, so that the force of the exploding charge in the cannon will have a tendency to expand the rear end of the cap C, press its walls closely against the sides of the bore, and assist it in forming an air and gas tight joint between the rear end of the cap and the bore of the cannon.

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

1. The combination, with the shell A, having at its rear extremity the expansible flange *c*, and containing the explosive charge, of the cap C, arranged on the rear end of the shell and provided with the attached rear closing-head, *a*, convexed on its outer face, so that the force of the exploding charge in the cannon will expand the rear end of the cap, substantially as and for the purposes described.

2. The combination, with the shell A, containing the explosive charge, and having at its rear extremity the expansible flange *c*, of the cap C, arranged on the shell and having at its rear end the expansible flange *b*, and attached convex closing-head *a*, which is acted on by

the exploding-charge in the cannon to expand the rear end of the cap, substantially as and for the purposes described.

3. An explosive projectile consisting of a shell, A, containing the explosive charge, and provided on its forward end with the ring *e*, and at its rear extremity with the expansible flange *c*, and the cap C, having the convex rear closing-head, *a*, carrying the expansible flange *b*, and arranged on the rear of the shell, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

CHARLES G. OTIS. [L. S.]

Witnesses:

W. HAUFF,

OTTO HUFELAND.