

E. DRAKE.
Projectile.

No. 109,600.

Patented Nov. 29, 1870.

Fig. 1.

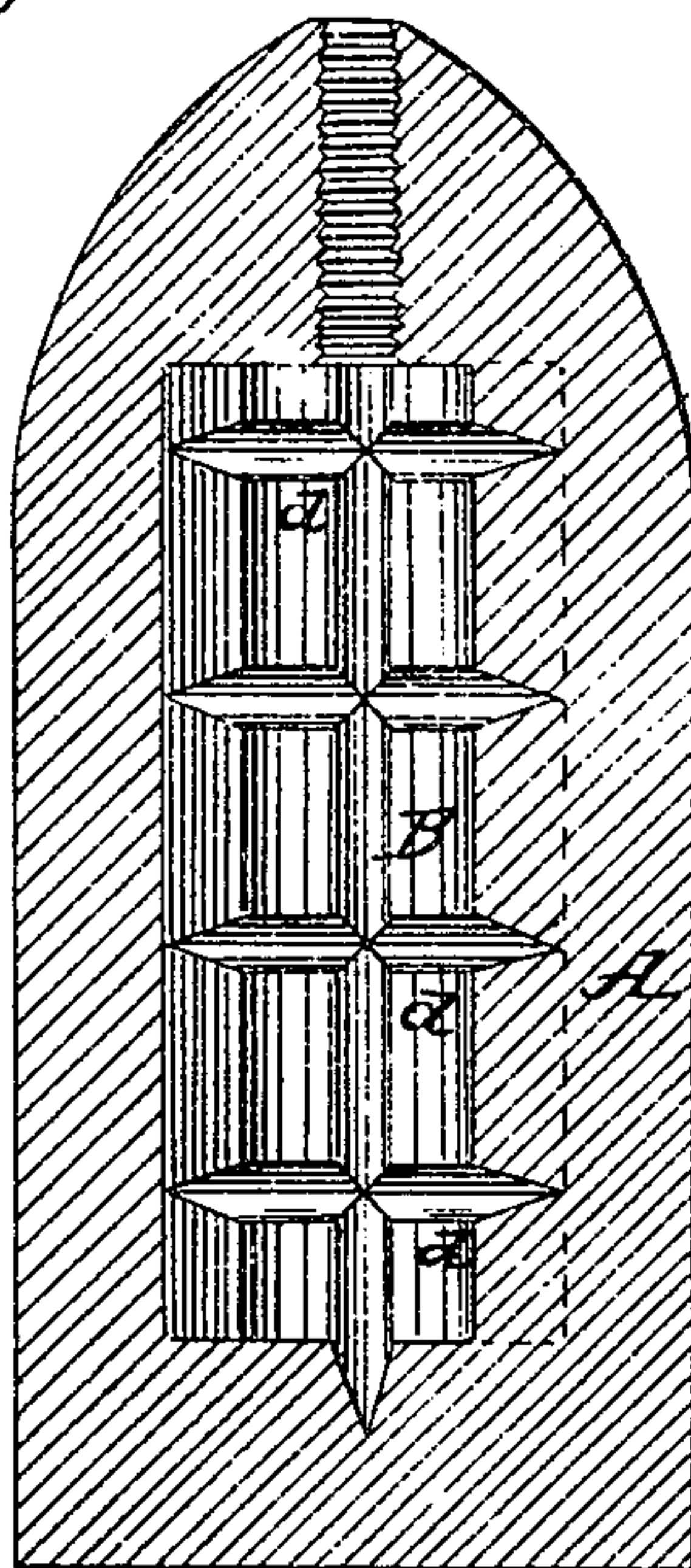


Fig. 5

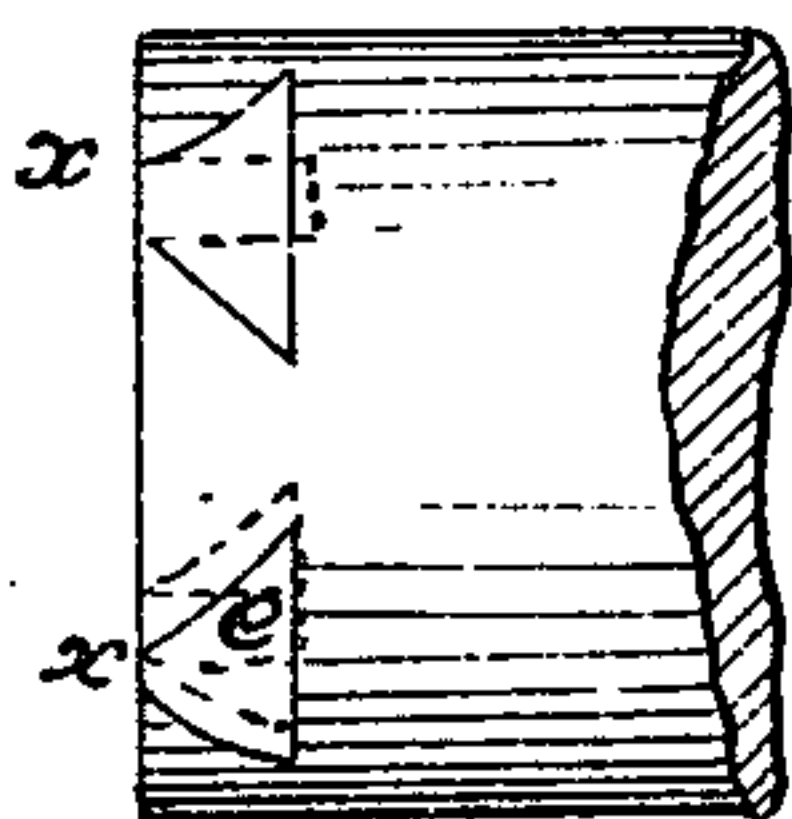


Fig. 2

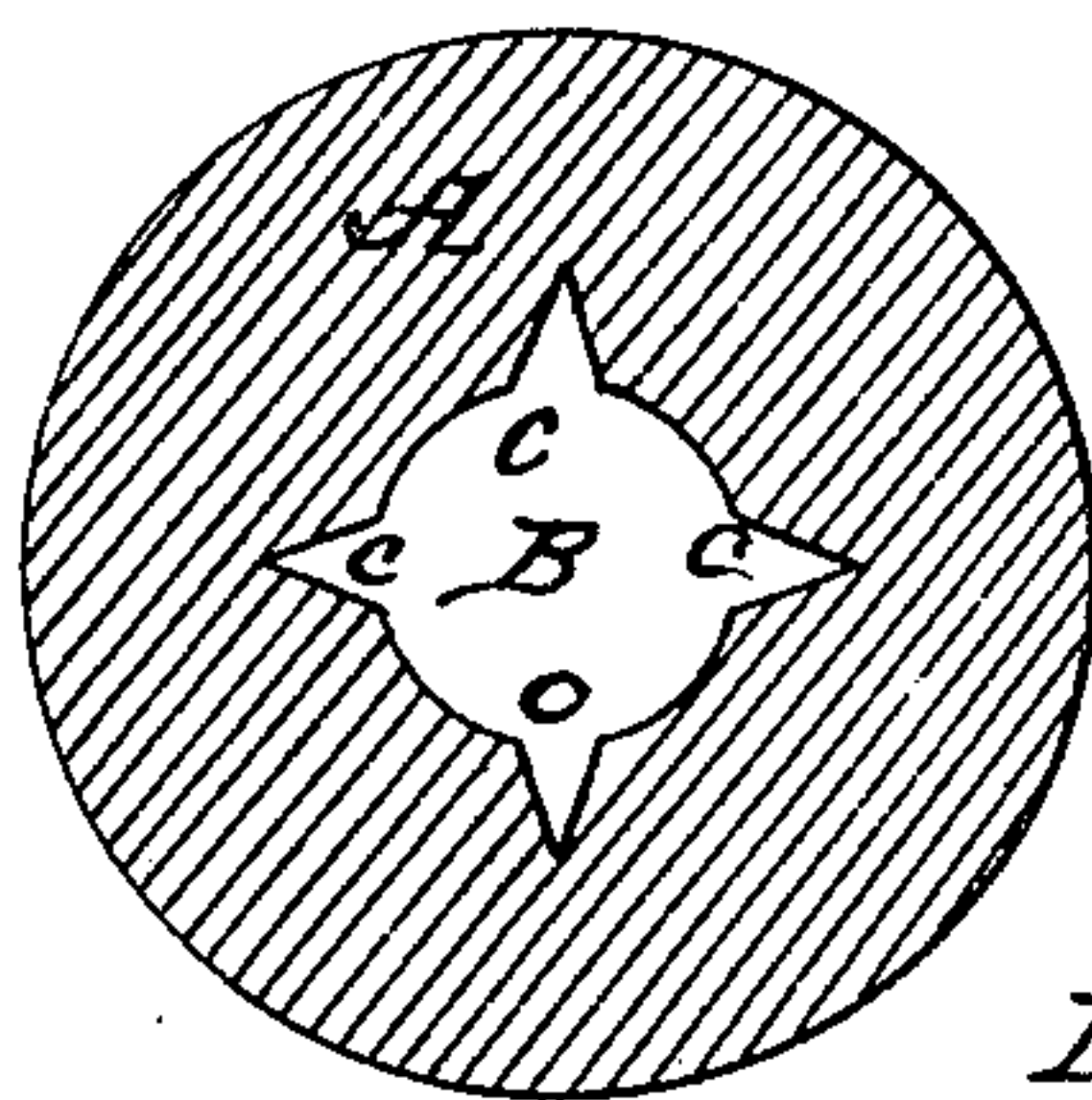


Fig. 6

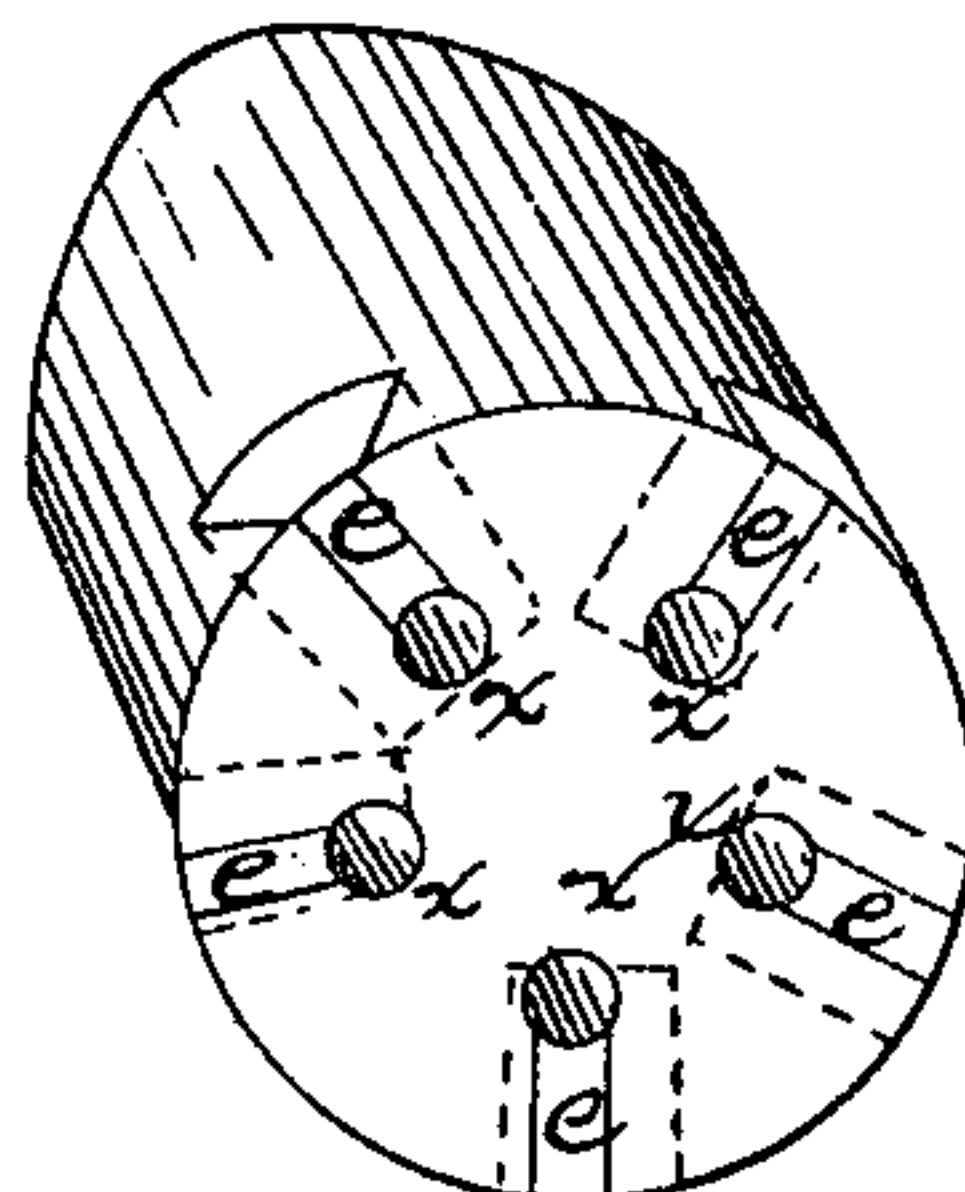


Fig. 3

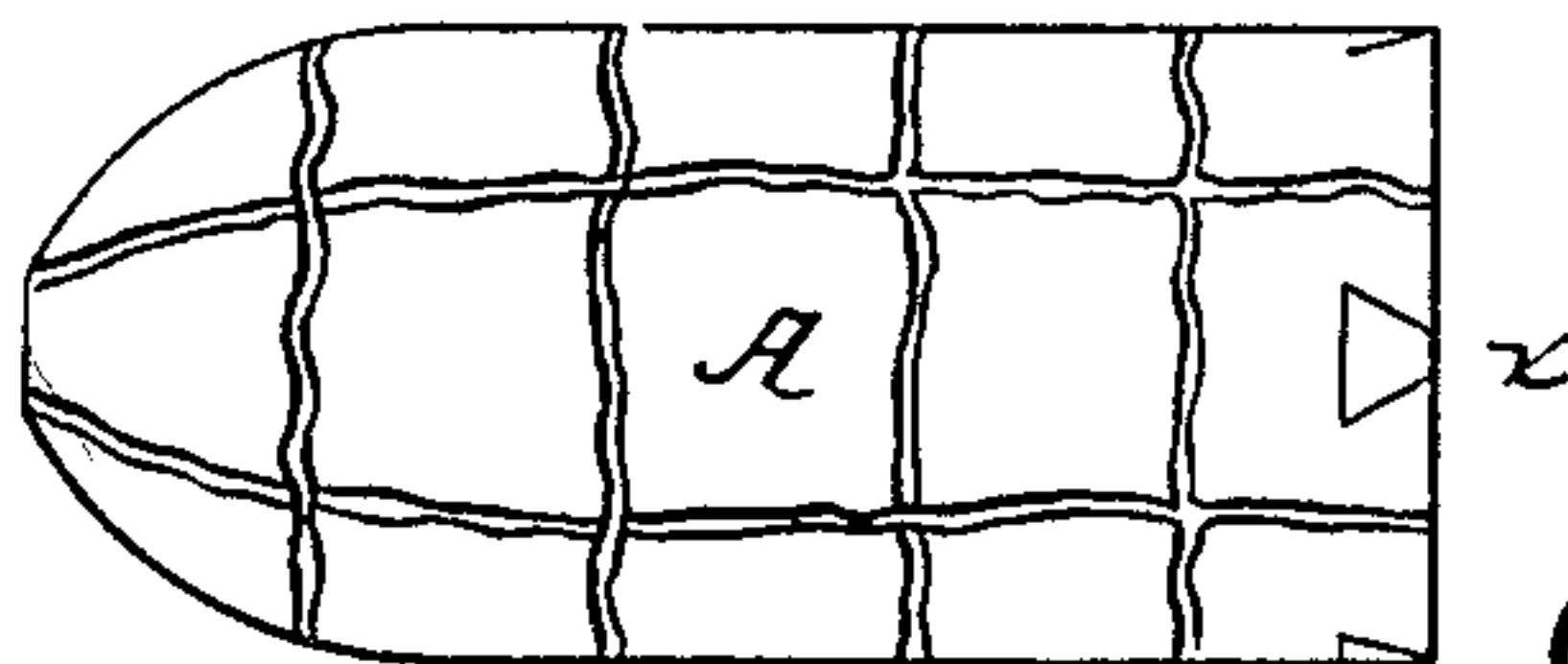
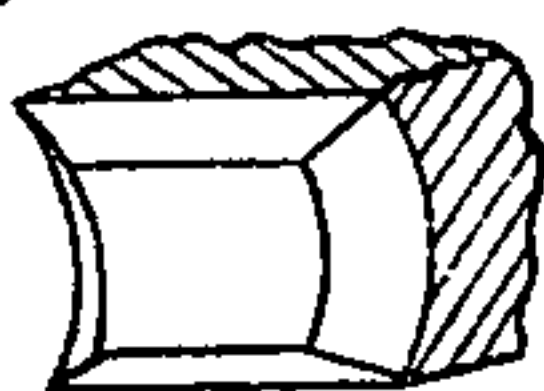


Fig. 4



witnesses
Harry King
A. H. Dunkel

Inventor
Ellis Drake
by Niedersheimoxe Norris
his ally

United States Patent Office.

ELLIS DRAKE, OF STOUGHTON, MASSACHUSETTS.

Letters Patent No. 109,600, dated November 29, 1870.

IMPROVEMENT IN PROJECTILES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ELLIS DRAKE, of Stoughton, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Projectiles or Shells; and I do hereby declare the following to be a full, clear, and exact description of the same, which will enable others to make and use the improvement, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a central vertical section.

Figure 2 is a horizontal section.

Figure 3 is a side section after the shell has been exploded.

Figure 4 is a perspective view of square section after explosion.

The object of my invention is to contrive and provide, at a reasonable cost, an explosive shell, having the quality of breaking into nearly equal segments upon explosion thereof; and also the greatest possible range and accuracy of flight practicable with a hollow projectile; and

My invention consists—

First, in making a shell with annular and straight grooves crossing each other at right angles in the cavity or charge-chamber of the same. I use, in connection with a shell of the form shown, a compound of greater power and rapidity of explosion than the best gunpowder, and upon experiment it is found that such a combination produces a projectile which, when exploded, breaks into nearly equal segments, and is equally effective with those made of a series of grooved or notched rings held together by bolts or some equivalent means. It will be observed that the shell above described is cast in a single piece, the cavity cored out in the form shown, and, in connection with a highly explosive compound, is quite as effective as the ring and bolt projectile, which must of necessity cost many times more than my shell.

The second part of my invention consists in combining with a projectile a series of expanding lugs or buttons, equal in number with the grooves of the gun in which the same is to be used and operated, in the manner hereinafter described.

A in the several figures of the drawing represents the body of a projectile or shell, the interior portion or cavity of which is corrugated or grooved in the manner shown in the drawing, so that when the same is charged with a highly explosive compound and exploded, the sections into which it is broken will correspond with the grooves or corrugations upon its interior surface.

The concentrated explosive compound is placed within the small cavity or recess B, and fills up snugly the corrugations or angular portions *c c d d*, and when fired the sudden explosion of the same separates the shell at the said angular parts.

This is an important feature in the construction of projectiles or shells, since by experiment it has been found that by the use of highly explosive compounds the shell is parted at the angle or bottom of the groove.

In Figures 5 and 6 are shown the peculiar form of the expanding lugs or buttons, in which the letters *c c* designate a series of radial lugs, formed of metal, of a suitable character.

In the present instance they are inserted in the periphery of the shell in a dovetailed form, so as to be held in place, and prevented from being torn loose from the shell by friction against the grooves of the gun. Spaces or openings *x x* are left at the base of the lugs.

When a shell is provided with this improvement, the gas, upon firing, expands into the spaces or openings *x*, at the base of said lugs, and forces out radially the lugs *c c* into the grooves of the gun, for the purpose of giving twist to the shot.

It will be seen that the pressure of the gases of the exploded charge in the gun is utilized to expand or force out the lugs or buttons without upsetting or bending the metal, and hold the same in the grooves of the gun with any pressure desired, as the same may be varied by altering the area of the openings at the base of the lugs.

Having thus described my invention,

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

1. A projectile or shell, cast in one piece, with cross-grooves *c c* and *d d*, substantially as and for the purpose set forth.

2. In combination with a projectile or shell a series of expanding lugs, operated in the manner substantially as described.

3. A space formed at the base of a lug or button, whereby the same may be operated upon by the force of the explosion, and radially forced out or expanded, for the purpose specified.

To the above I have signed my name, this 8th day of November, A. D. 1870.

ELLIS DRAKE.

Witnesses:

JAMES L. NORRIS,
W. H. FINCKEL.