

# UNITED STATES PATENT OFFICE.

JOHN F. SHEARMAN, OF BROOKLYN, E. D., NEW YORK.

## IMPROVEMENT IN PERCUSSION-FUSE FOR EXPLOSIVE SHELLS.

Specification forming part of Letters Patent No. 54,027, dated April 17, 1866.

*To all whom it may concern:*

Be it known that I, JOHN F. SHEARMAN, of Brooklyn, E. D., in the county of Kings and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Projectiles for Ordnance; and I do hereby declare the following to be a full, clear, and exact description of my said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a longitudinal section of my projectile. Fig. 2 is a side elevation of the same. Figs. 3 and 4 are views of the rear end of the projectile, and Figs. 5 and 6 are views of the front end of the projectile. In Fig. 5 the screw-plug is removed.

Similar marks of reference denote the same parts.

Projectiles have heretofore been made with a sliding nipple carrier or hammer held into a screw-sleeve by means of a set-screw, the end of which enters a hole in the side of said sliding nipple-carrier. In this construction the end of the screw is apt to be cut off in the sudden rotation of the projectile by the rifle-grooves, because the force necessary to overcome the inertia and rotate said nipple-carrier is derived alone from the point of the screw. Hence premature explosions sometimes occur from the nipple-carrier being loose in its flight from the before-mentioned cause.

The nature of my said invention consists in forming a groove around the nipple-carrier receiving the point of the retaining-screw, so that the shell may be rotated by the rifle-grooves without the said nipple-carrier being rotated as the projectile is suddenly started. I also make use of two or more nipples carrying percussion-caps to insure explosion when the projectile strikes; and I introduce a safety-wire between the hammer and screw-plug.

In the drawings, *a* is the shell of the projectile, with the central cavity, *b*, for the reception of the powder. *c* is a polygonal base at the back end of the projectile, over which is placed the polygonal opening of the ring *d*, which is formed hollow, as represented, in order that the pressure of the gases when the projectile is fired may expand the said ring to form a gas-check, and also fill the grooves when said projectile is used in a rifled gun.

By having the polygonal projection *c* slightly undercut or tapering toward the front of the projectile, the ring *d* of brass or other soft metal will be forced thereinto by the explosion sufficiently to hold said gas-check *d* upon the projectile during its flight, and by this mode of construction the said gas-check can be cast and finished separately from the projectile, and only requires to be driven upon the said polygonal projection *c*.

*f* is the percussion cylinder or sleeve, fitted to screw into the forward end of the projectile, and carrying within it the percussion-nipple hammer *g*, as heretofore; but I form around the said hammer *g* a groove at *i*, receiving the point of the screw *k*, so that the projectile may rotate on starting before the hammer *g* commences to turn, the said groove *i* allowing of this movement without injury to the screw *k*.

I make use of two or more nipples or cones *l*. I have shown three, and upon each of these cones a cap is to be placed, so that when the momentum of the shell is arrested by striking any object the inertia of the hammer *g* will cause it to go forward, cutting off the point of the screw *k*, and, striking the percussion-caps on the nipples *l* against the inner side of the screw-plug *m*, cause the explosion of the shell; whereas in cases where only one nipple is employed a defect in the one percussion-cap will prevent the shell being exploded.

I have shown a short piece of wire, *n*, introduced in a hole in the screw-plug *m* and passing back against the face of the hammer *g*, to afford additional security in transportation. This is to be removed by unscrewing the plug *m* previous to using the projectile.

It will be evident that if the screw *k* was introduced in such a position that its point came in front of the end of the hammer *g* the motion in starting would be allowed for, as before mentioned, or if the screw or a cross-pin was introduced in the back portion of the said hammer *g*, so that the end would project over the back end of the sleeve or cylinder *f*, the same effect would be attained.

I find that shells usually are not thick enough to withstand the concussion in firing, as they very often break to pieces in the gun, and when made sufficiently thick to obtain the necessary strength they are not broken into many pieces by the explosion. I find practically that

when the area of the cavity is one-seventh or less of the area of the projectile transversely the shell will not break in firing, and, in order to cause the shell to break into small fragments when it explodes, I fill the same with gun-cotton or other explosive material more powerful than gunpowder.

I do not claim the use of several percussion-caps in a projectile acting in different directions, according to the way in which the projectile strikes the object; but

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

1. The mode herein specified of allowing the projectile to rotate without at first revolving

the percussion-hammer for preventing injury to the screw or its equivalent that holds said percussion-hammer when the shell is projected, as set forth.

2. In combination with the plunger *g*, fitted so that it can rotate as set forth, two or more nipples fitted to said plunger, as and for the purposes specified.

In witness whereof I have hereunto set my signature this 9th day of August, 1865.

JOHN F. SHEARMAN.

Witnesses:

THOS. GEO. HAROLD,  
CHAS. H. SMITH.