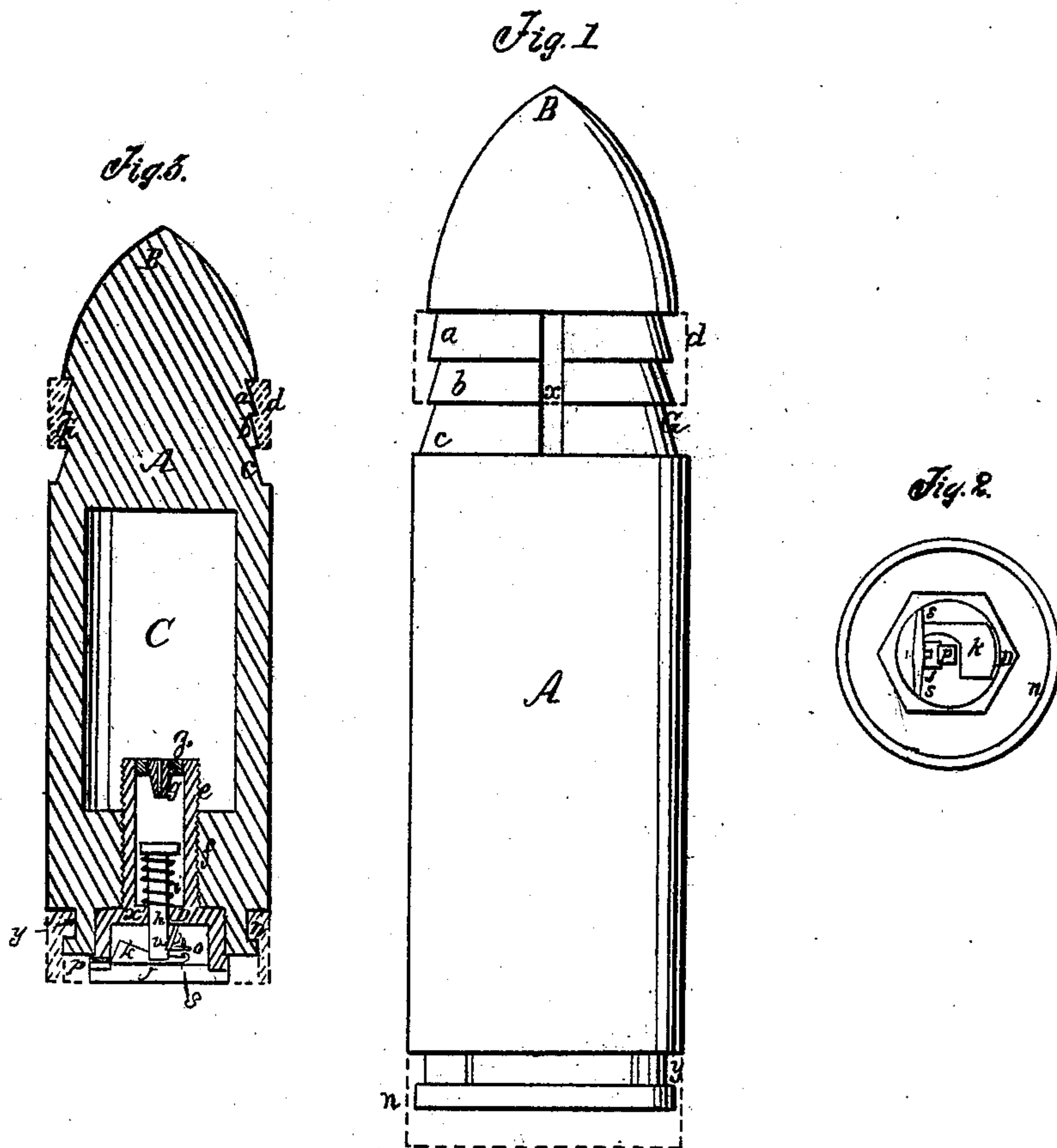


J. A. CURRAN.
Shell Fuse.

No. 47,803.

Patented May 23, 1865.



Witnesses:
Geo. Busch
W. Brown

Inventor:
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per M. H. B.
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UNITED STATES PATENT OFFICE.

JOHN A. CURRAN, OF THE UNITED STATES ARMY.

IMPROVED PERCUSSION-FUSE FOR EXPLOSIVE SHELLS.

Specification forming part of Letters Patent No. 47,803, dated May 23, 1865.

To all whom it may concern:

Be it known that I, JOHN A. CURRAN, of Thirty-Second Iowa Volunteers, United States Army, have invented a new and useful Improvement in Projectiles; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of a shell containing my invention. Fig. 2 is an end view, showing the fuse-cylinder open, its cover having been removed. Fig. 3 is a longitudinal axial section of the projectile.

Similar letters of reference indicate corresponding parts.

A is a shell with a pointed end, B, and a cavity or magazine, C, for powder, intended to be used in rifled ordnance. The forward part of the shell is solid, and access to the magazine is had through the back part of the shell, which is perforated and turned out, as seen in the sectional figure, to receive the fuse-cylinder D. The center of gravity of the shell is forward of the middle of its length. The shell is grooved around its hinder end at *y* to receive a soft metal ring, which will be expanded by the pressure of the gases arising from the explosion of the charge, so as to fill the grooves of the gun. The forward part of the shell has a groove, G, where the pointed end meets the enlarged diameter of the rest of the shell. The bottom of this groove consists of three or more inclined planes, *a b c*, of different heights, declining successively toward the forward end of the shell, as shown in the drawings. Longitudinal grooves *x* are also made in the bottom of the groove G, cutting the said planes transversely. The bottoms of these grooves *x* also incline in the same direction with the planes *a b c*. A ring, *d*, of soft metal, is run in the groove G and properly fitted therein, so as to occupy the forward portion thereof, about as shown in the drawings, the longitudinal grooves *x* preventing the ring, when the gun is fired, from rotating in the groove G. The rammer of the gun is to be constructed so as to embrace the point of the shell and strike against the forward end of the soft metallic ring *d*, so that when force is applied to the rammer, to drive the shell into the gun, the ring

will be forced farther back in its groove, riding upon the inclinations thereof and becoming expanded in diameter so as to fill the windage-space wholly or partially. When the gun is fired and the projectile is started, the inertia of the ring *d* will cause it to slide still farther upon the inclined planes of the groove and effectually fill the grooves of the gun, while at the same time the expansion of the gases behind the shell expands the ring *n*, which is also to be made of soft metal. The opening in the rear of the shell communicating with the magazine C is provided with a screw-thread, *f*, by means of which the fuse-cylinder D is fitted to the shell. This cylinder is closed at each end by caps *g* and *J*, which are secured therein by means of screw-threads cut thereon and on the ends of the cylinder within. The cap *g*, furthermore, is fitted with a nipple which projects inward, on which a percussion-cap is to be fitted. The nipple extends through the cap *g*, and, being perforated, the explosion of the percussion-cap causes the powder in the magazine to ignite. The fuse-cylinder is divided into two parts of unequal length by a perforated diaphragm, *x*, the shorter part, *y*, being of greater diameter than the longer part, and fitting a cavity made for it in the heel of the shell. A plunger, *h*, made solid and heavy, is fitted within the cylinder, so as to explode the cap, as hereinafter explained. The plunger has a disk-shaped head on that end which is nearest the nipple, for the double purpose of causing it to strike the cap without fail when it descends, and also to form a bearing for a spring, *i*, which surrounds its adjacent end. That part of the plunger which receives the spring—that is to say, about one-half its length—is round and the remainder is made square to fit the perforation in the diaphragm *x*, which is also square. *j* is a spring-detent of elbow shape, which is securely fixed in the outer face of the diaphragm *x*, near its opening. Its elbow projects horizontally away from the side of the plunger, and it has an eye or slot cut in it, as seen in Fig. 2.

K is a pendulous lever, which is suspended in the sides of the enlarged part of the cylinder by means of its arms *s*. O is a hook which projects downward from it in such a position as to take into the eye or slot of the spring-detent. A notch, *u*, is cut on one side of the plunger at such a distance from its end as to

permit the detent *j* to fall therein and hold the plunger up in the fuse-cylinder, as shown. The pendulous lever *K* is so shaped as to permit the plunger to pass up along its side, the top of the plunger reaching nearly to the cap *J*. The upper end of the spiral spring *i* is compressed between the disk-head of the plunger and the inner face of the diaphragm *x*, when the plunger is held by the detent in the position shown in Fig. 3.

p is a pin, which is screwed into the side of the cylinder just below the cap *J*, and which takes into a recess (not shown) in the face of the lever *K*, so as to hold and lock it while the fuse is not wanted for use and when it is being transported.

The magazine having been charged and a cap having been placed on the nipple *g*, and the plunger secured in the position shown in Fig. 3, the locking-pin *p* is withdrawn and the shell is ready for use.

When the shell has been fired, any concussion on its forward end will cause the heavy free end of the pendulous lever to be thrown forward toward the diaphragm *x*, when its hook *O* will draw the spring-detent *j* out of the notch *u* in the side of the plunger, whose spring *i* will then throw it against the cap, the explosion of which will cause the powder in the magazine to become ignited.

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

The combination of the plunger *h*, spring *i*, detent-spring *j*, weight *k*, and arm *o*, when constructed and arranged to operate as and for the purposes herein specified.

JOHN A. CURRAN.

Witnesses:

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