No. 647,546. Patented Apr. 17, 1900.

A. F. WARREN.

SHRAPNEL SHELL.

(Application filed Nov. 22, 1899.)

(No Model.)

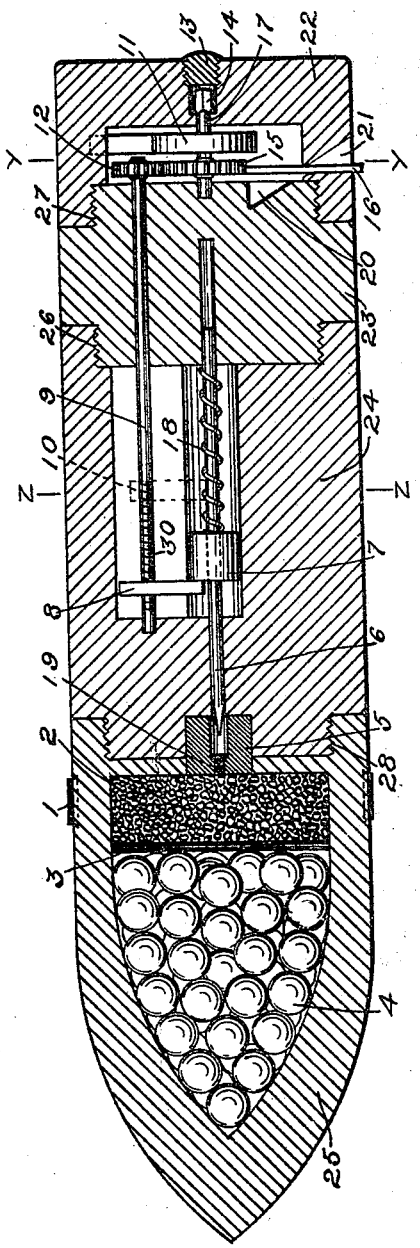

FIG. 1.

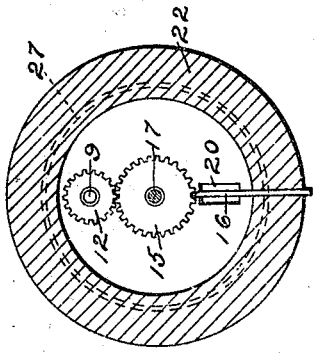

FIG. 3.

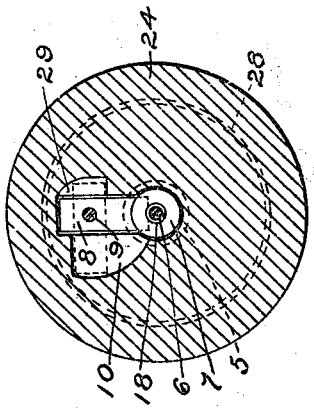

FIG. 2.

WITNESSES.

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SHRAPNEL SHELL.

SPECIFICATION forming part of Letters Patent No. 647,546, dated April 17, 1900.

Application filed November 22, 1899. Serial No. 737,967. (No model.)

To all whom it may concern:

Be it known that I, ALVA F. WARREN, a citizen of the United States, residing at Providence, in the State of Rhode Island, have invented a new and useful Improvement in Shrapnel Shells, of which the following is a specification.

The nature of my invention consists in the improved construction and arrangement of the parts of the shell and in the construction of the firing mechanism, as I hereinafter set forth.

In the accompanying drawings, Figure 1 represents a central longitudinal section of a shrapnel shell embodying my improvement. Fig. 2 represents a cross-section taken at the line *x x* of Fig. 1. Fig. 3 represents a cross-section taken at the line *y y* of Fig. 1.

In the drawings, 24 represents the chambered body portion of the shell, to which the head 25, provided with the windage-band 1, is secured by means of the screw-thread 28, and to the rear of the body portion 24 is secured the plug-piece 23 by means of the screw-thread 26, and to the plug-piece 23 is secured the end cap 21 by means of the screw-thread 27. Within the chamber of the head 25 are placed the numerous small balls 4, and at the rear of the said balls is placed a quantity of guncotton 3, and back of the guncotton is placed the charge of powder 2, the firing-chamber being then closed by means of the percussion firing-tube 5, in which the explosive cap 19 is held, the said firing-tube being held in proper position when the head 25 and the body portion 24 are screwed together. Within the chamber of the body portion 24 is placed the firing-pin 6, to which is secured the weight 7, and upon the shank of the firing-pin is placed the spiral spring 18, which serves to throw the firing-pin forward to cause the explosion. The firing-pin 6 is retained in its rearward position for disengagement by means of the block 8, which is held loosely in the chamber 31 of the body portion 24, which chamber is made to conform to the contour of the said block, with the exception of the opposite recesses 10 and 29. (Shown in the transverse section, Fig. 2.) The block 8 is threaded to fit the screw 9, which is caused to rotate by means of the gear 12, secured to the end of the screw, and the gear 15, screwed to the winding-shaft 17, the end 14 of which is squared to fit a suitable winding-key, and to the shaft 17 is secured the convolute spring 11, which serves to impart a reverse rotary movement to the winding-shaft. The end of the shaft 17 is covered by means of the screw-plug 13, and the spring 11 is held in its wound condition by means of the locking-pin 16, one end of which enters the space between the teeth of the gear 15 and the other end projects slightly beyond the outer surface of the shell, whereby when the shell is being fired from the gun the locking-pin will be thrown out from between the gear-teeth as it leaves the cartridge, the said pin being forced into the opposite recesses 20 and 21, and upon the release of the gear 15 from the locking-pin 16 the unwinding action of the spring 11 will cause the rotation of the screw 9, which will cause the backward movement of the block 8 and the engaged firing-pin against the forward action of the spiral spring 18 until the said block arrives at the end of the screw-thread 30 and opposite the recesses 10 and 29. (Shown in Fig. 2.) Then the block 8 will be prevented from further backward movement by the unthreaded portion of the screw-shaft and then be turned away from contact with the weight 7 and into the said recesses, as shown by the dotted lines in said Fig. 2, thus allowing the spring 18 to throw the firing-pin forward to explode the cap 19 to ignite the charge of powder and kill the enemy.

The position of the block 8 on the screw 9 may be graduated for time explosion as desired.

I claim as my invention—

1. In a shrapnel shell, the combination of the percussion firing-tube; the spring-actuated firing-pin; the screw-shaft; the screw-actuated block which engages with the firing-pin; the spring for actuating the screw-shaft; the gears; the locking-pin; and the recess in the side of the chamber of the body portion, into which the block is moved by the action of the spring upon the arrival of the block at the end of the screw-thread, substantially as described.

2. In a shrapnel shell the combination of the percussion firing-tube; the spring-actu-

ated firing-pin; the screw-shaft; the screw-actuated block which engages with the firing-pin; the spring for actuating the screw-shaft; the squared winding-shaft for the spring; the plug for protecting the end of the winding-shaft; the gears; the locking-pin; and the recess in the side of the chamber of the body portion into which the block is moved by the action of the spring upon the arrival of the block at the end of the screw-thread, substantially as described.

ALVA F. WARREN.

Witnesses:
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