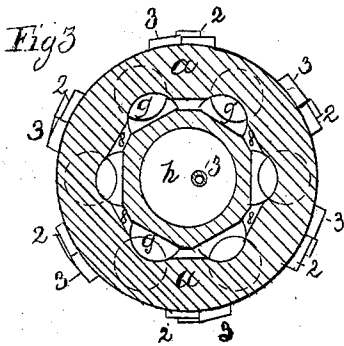
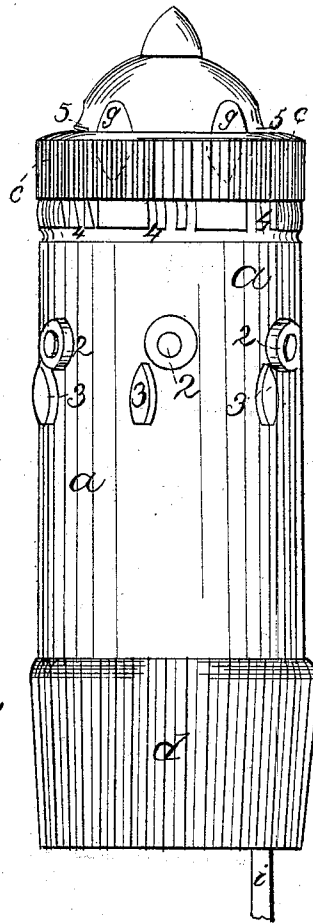
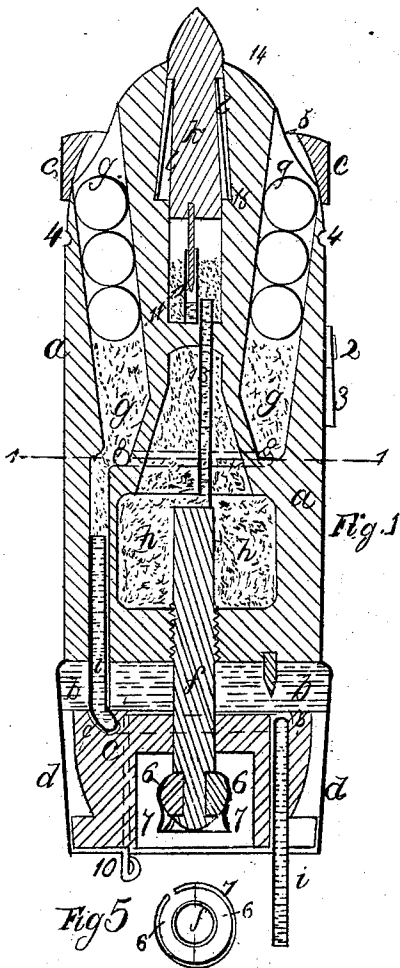


J. M. HATHAWAY.

Shell.

No. 34,685.

Patented Mar. 18, 1862.



Witness

John M. Hathaway

Samuel W. Sewell

Wm. Geo. Barold

UNITED STATES PATENT OFFICE.

JOHN M. HATHAWAY, OF NEW YORK, N. Y.

IMPROVEMENT IN EXPLOSIVE SHELLS FOR ORDNANCE.

Specification forming part of Letters Patent No. 31,685, dated March 18, 1862.

To all whom it may concern:

Be it known that I, JOHN M. HATHAWAY, of the city and State of New York, have invented and made a certain new and useful Improvement in Projectiles; and I do hereby declare that the following is 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 vertical section of my improved bomb. Fig. 2 is an elevation of the same. Fig. 3 is a sectional plan at the line 1 1, and Fig. 4 is an elevation of the plug and spring applied to cause detonation when the shell strikes.

Similar marks of reference denote the same parts.

My said invention relates to an elongated bomb or projectile with diverging barrels containing balls that are fired out just before reaching the object aimed at, and then the shell itself is exploded.

In the drawings, *a* is the metallic bomb, formed of the diameter required for the particular cannon, and of a proportionate length, and tapered at the forward end. The bomb *a* is provided with rollers 2 2 on its outside, corresponding in number with and adapted to enter the rifling grooves of the cannon, and by rolling avoid friction as much as possible in commencing to revolve the ball as projected. The wings 3 3 also serve to rotate the ball and act in case of injury to either of the rollers 2 2. At the base of the projectile is a disk of cork, rubber, or similar elastic material, *b*, and attached to this is a tapering cylinder, *d*, of corrugated metal. These parts are attached as hereinafter set forth, and their action is to keep the gases confined and prevent windage, for on entering the ball into the bore the rear end of the tapering cylinder *d* enters easily; but as shoved in, the cork or elastic base *b* is compressed, and the corrugated cylinder *d*, expanding with the force of the explosion, sets tightly to the inside of the gun.

To aid in preventing windage, and also to support the forward end of the ball and prevent injury to the cannon, I employ the tapering lead ring *c*, which surrounds the front end of the ball, and when driven down by a hollow-ended ramrod fits tightly the bore of the gun, and as the ball starts forward this lead

ring is partially slugged by the ball moving before the ring, and hence the rifle-grooves are thoroughly filled. The circular grooves 4 4 in the ball prevent the ring going back too far, and the longitudinal ones insure the movement of the ring and ball together. Small pins 5 5 may be employed to keep the ring on the ball prior to loading. A corrugated band of sheet metal is to be introduced around the lead ring *c* outside to strengthen it.

In order to hold the elastic base *b* to the ball I employ the turning-disk *e* (which also acts as a fuse-regulator) and the pin *f*. This pin *f* is attached to the ball *a* and has a collar at the rear end thereof, and a divided nut or washer, 6 6, held together by the conical spring-ring 7, (see Fig. 5,) so as to keep the disk *e* and base *b* secured to the bomb-shell prior to firing; but the force of the explosion spreading the ring 7 and driving it forward, the half-washers 6 6 drop off and allow the ball *a* and base *b* to separate after leaving the cannon, so that the ball is not obstructed in its flight.

g g are a series of barrels cast in the bomb *a*, diverging as shown, and these are connected to each other by a circular channel, 8, (see Fig. 3,) and these barrels are to be loaded with powder and several balls in each chamber. These being exploded just before the bomb reaches its destination, pour a well-directed shrapnel fire upon an enemy, the balls diverging slightly from the course of the bomb. *h* is a powder-chamber, to be finally exploded to shatter the bomb to pieces.

According to the particular circumstances under which this ball is to be used should the explosions be regulated. If for naval service, the barrels *g g* should be fired when the bomb strikes the vessel, and if for field action should be fired before the bomb reaches the ranks of the enemy. I have therefore shown the mode in which I contemplate effecting these objects. The fuse *i* is led through a hole in the disk *e* and attached in the bomb *a*, terminating near the cavity 8, and the side of *e* next the bomb *a* is channeled with a circular groove, 9. If the fuse *i* passes out straight, it will be short and quick; but if the disk *e* be turned, said fuse will be drawn into the groove 9, and can be left a greater or less length, as required for timing the explosion, and at the same time said fuse will be pro-

ected and not protrude beyond the disk *e*, as it is to be cut off after the disk has been turned to the desired point. A pin, 10, may be driven into the base *b*, to keep it from turning when set. The fire communicating through this fuse explodes the barrels *g g*, and then may explode the chamber *h* if a hole is left, as shown by the dotted line at 11, Fig. 1. I, however, prefer that the bomb itself be shattered when it strikes, and therefore provide the plug *k* with a wire to be driven upon a detonating-pill in the pipe 12. 13 is a pipe leading the fire to the chamber *h*.

In order to prevent any accidental blow on the plug *k* thus exploding the shell, I provide the cylindrical spring 7, that is sufficiently tapering to take the shoulders 14 on the plug and 15 on the inside of the shell. This spring 7 is formed of sheet metal cut with longitudinal incisions, so as to form a series of springs end on, the springs thus formed being bent alternately out and in, hence able to resist any slight blow, while a heavy one causes the springs to bend more and the cylinder 7 to shorten or be pressed together lengthwise, so as to permit the wire tail of *k* to strike the detonating substance in the pipe 12.

I do not claim a bomb with several barrels or chambers; neither do I claim an elastic base, *b*, or a metallic cup in themselves; nor a spring to the detonating-plug; and I am aware that conical rings of lead have been used at the tapering parts of the bomb; but

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

1. The arrangement of the diverging barrels *g g*, connected together at their base by the circular groove 8, surrounding the chamber *h*, and fired in the manner specified.

2. The lead ring *c*, provided with a corrugated sheet-metal band, in combination with the circular and longitudinal grooves 4 at the tapering end of the bomb, as and for the purposes set forth.

3. The elastic base *b*, in combination with the tapering corrugated metal *d*, in the manner and for the purposes specified.

4. The disk *e*, through which the fuse *i* passes, when fitted as set forth, to regulate the length of said fuse, as specified.

5. In combination with the base *b* and disk *e*, the pin *f*, divided washer 6, and conical ring 7, for the purposes set forth.

6. The tapering sheet-metal spring 7, constructed as specified, and applied to sustain the detonating-plug *k*, as set forth.

7. The rollers 2 2, arranged and applied as shown, to take the rifling-grooves, for the purposes specified.

In witness whereof I have hereunto set my signature this 10th day of December, 1861.

JOHN M. HATHAWAY.

Witnesses:

LEMUEL W. SERRELL,
THOS. GEO. HAROLD.