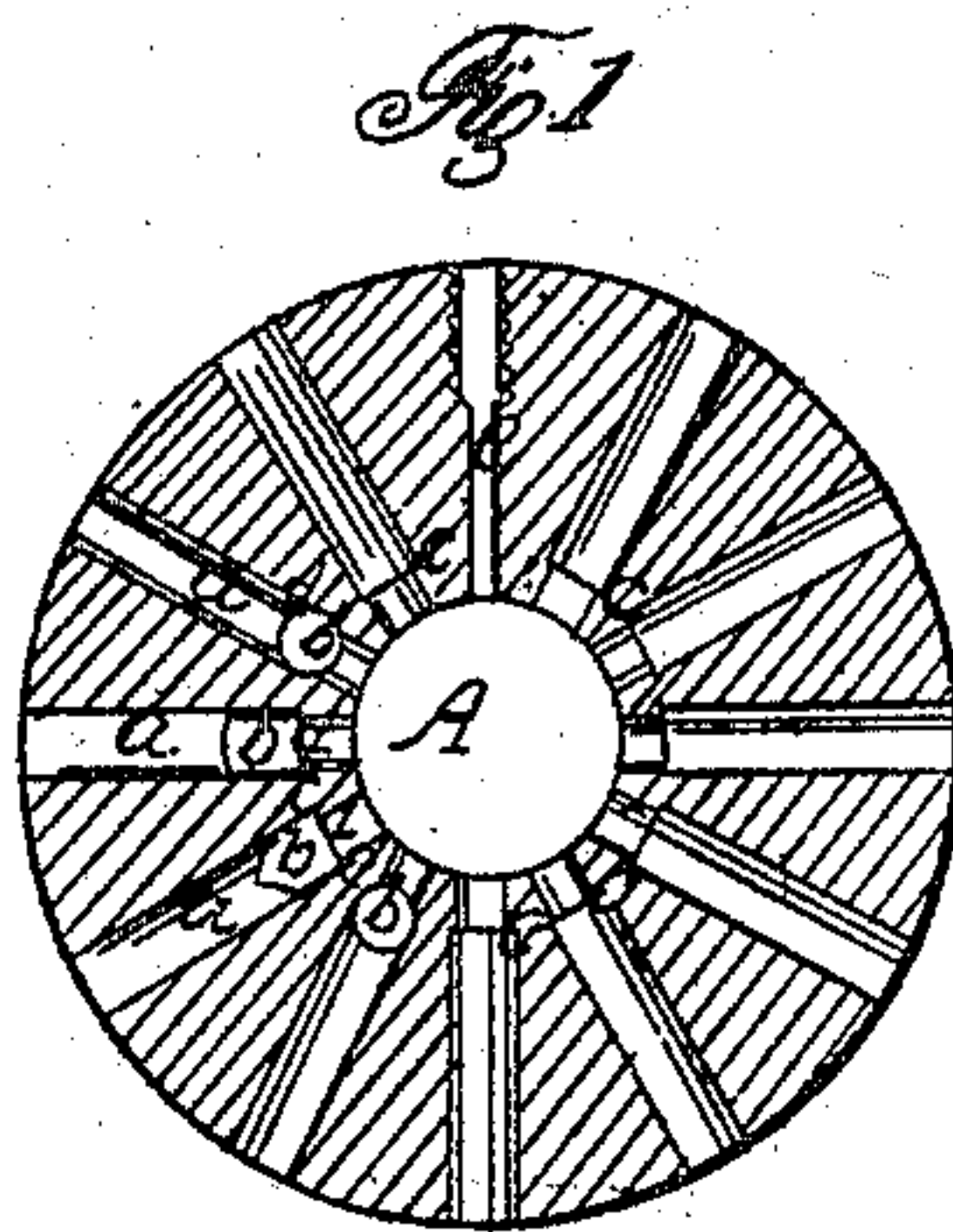
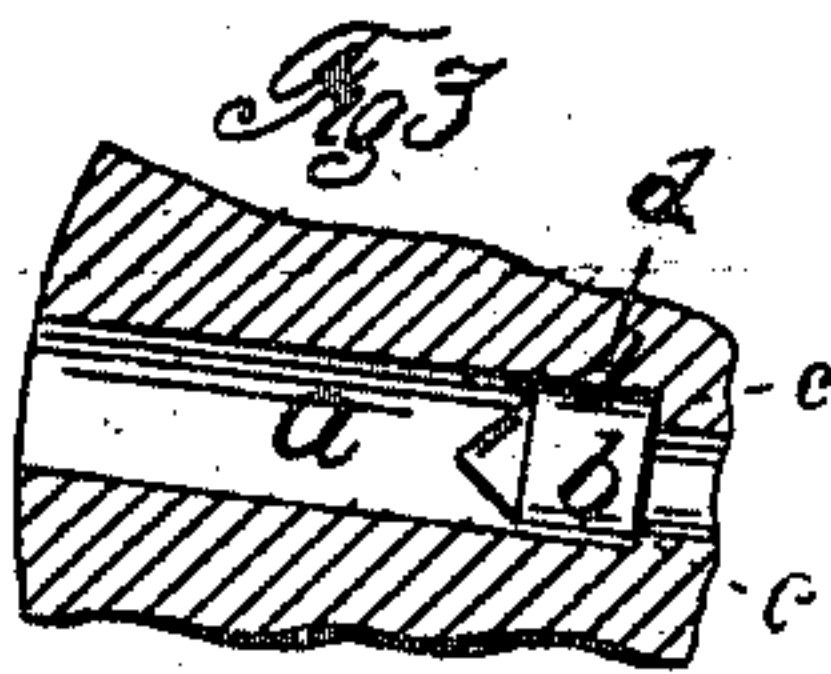
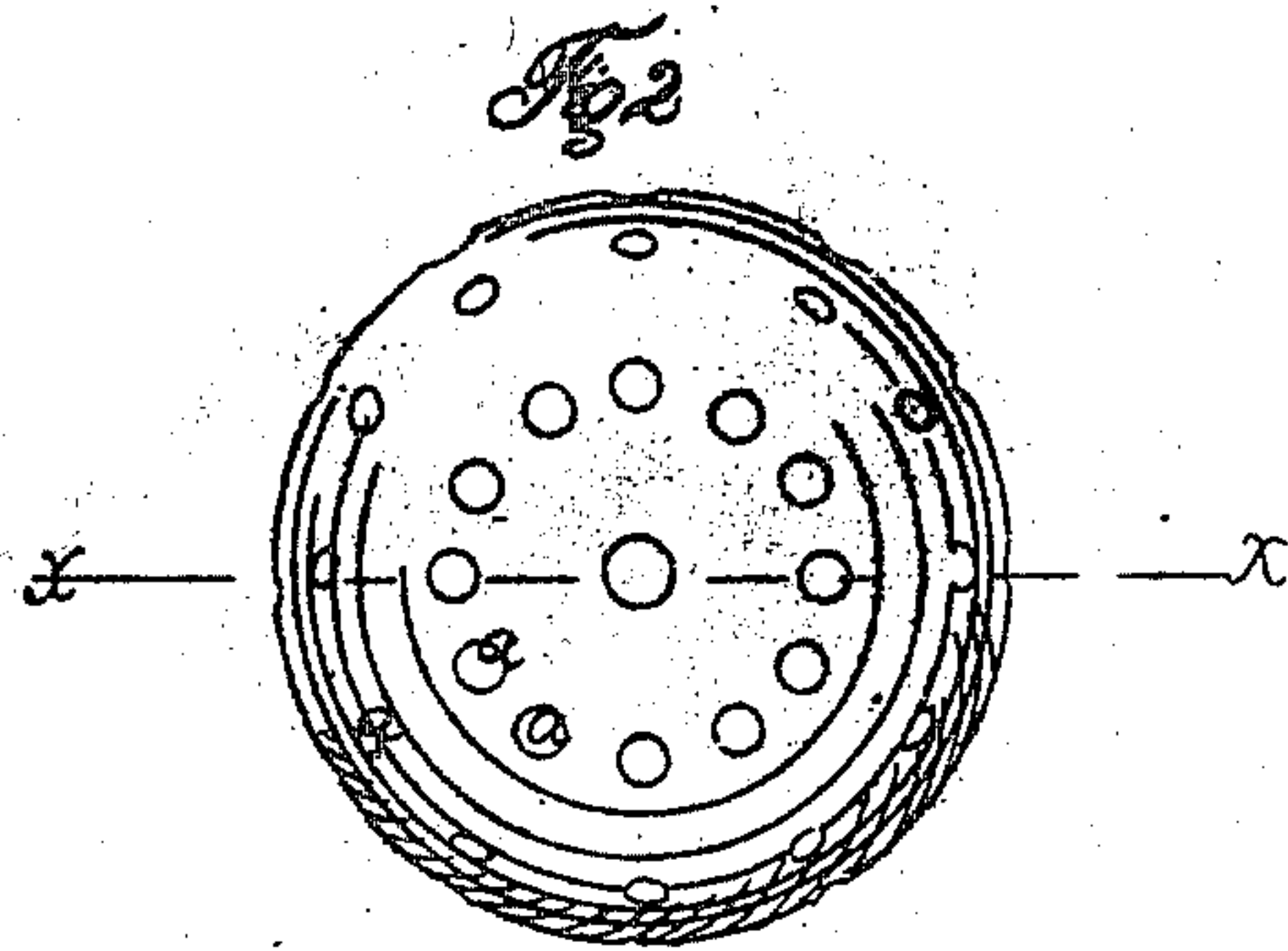


E. T. MILLER.

Shell

No. 11,901.

Patented Nov 7, 1854.



Elliott & Miller  
Attorneys } Joseph R. Hays and  
                  } John Hays

# UNITED STATES PATENT OFFICE.

ELLIOT T. MILLER, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN BOMBS, SHELLS, OR GRENADES.

Specification forming part of Letters Patent No. 11,901, dated November 7, 1854.

*To all whom it may concern:*

Be it known that I, ELLIOT T. MILLER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Bomb, Shells, or Grenades, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a section of the shell upon the line *xx*. Fig. 2; Fig. 2, a plan or elevation of the shell; Fig. 3, a section through one of the barrels *a*, seen in Fig. 1, with a slug, *b*, therein drawn on an enlarged scale.

The nature of my invention consists in perforating bombs or shells with cylindrical apertures or barrels *a*, communicating with the powder-chamber *A* in such manner that shot or other missiles, *b*, with which said barrels are loaded, shall be projected therefrom simultaneously in all directions radiating from the center of the shell.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In casting my improved bomb or shell I set a spherical core in the center of the mold for the purpose of forming the powder-chamber *A*. Radiating from and joining to this central core I place a large number of cylindrical cores to form the barrels *a*, which are constructed by a smaller diameter near the powder-chamber *A*, so as to form a shoulder, *c*, the use of which will be described in the operation of loading. The number of barrels is limited only by their size, and the size and strength of the shell, the strength of the shell being sufficient to prevent its bursting. The fuse is constructed like those used in the common shell. It is evident that the barrels *a* may be made by drilling through the shell instead of coring them, as described above. The balls or slugs *b* used in the barrels *a* can be made as grenades, or in

any other convenient manner, and of any suitable material.

I will describe the operation of loading and firing my improved shell, as follows: Cover the balls or slugs *b* with patch *d* to insure a close yet yielding fit in the barrels *a*, which may be rough or untrue from the manner of construction. Force the balls *b* down upon the shoulders *c*, as seen in Figs. 1 and 3. These shoulders prevent the balls from being forced into the chamber *A*, and by the resistance they offer indicate when the ball is driven home. The powder-chamber *A* is loaded either through the fuse-hole *e*, or through one of the barrels *a*. The first method is preferred as being the least dangerous. Regulate the fuse to the distance when the shell is to be exploded. Then place it into the fuse-hole *e*. Now load a cannon or mortar with the shell above described for a projectile, and fire in the accustomed manner. From the discharge of the powder the fuse is ignited. The effect produced by the explosion of the powder in the chamber *A* in the shell is to drive the missiles *b* from the barrels *a* simultaneously in all directions radiating from the center of the shell. This is an advantage over the common shell, which is burst by the explosion of the powder, the pieces of the shell in this case flying from the point of least resistance to the force exerted to burst the shell, which direction is likely to be any other than the one desired.

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

The combination of the barrels *a* and chamber *A*, in the manner and for the purpose herein set forth, and constructed substantially as herein described.

ELLIOT T. MILLER.

Witnesses:

EBEN HOYT, Jr.,

JEREMIAH R. O'CALLAGHAN.