

H. TYLER.
EXPLOSIVE-SHELL.

No. 174,325.

Patented Feb. 29, 1876.

Fig. 1.

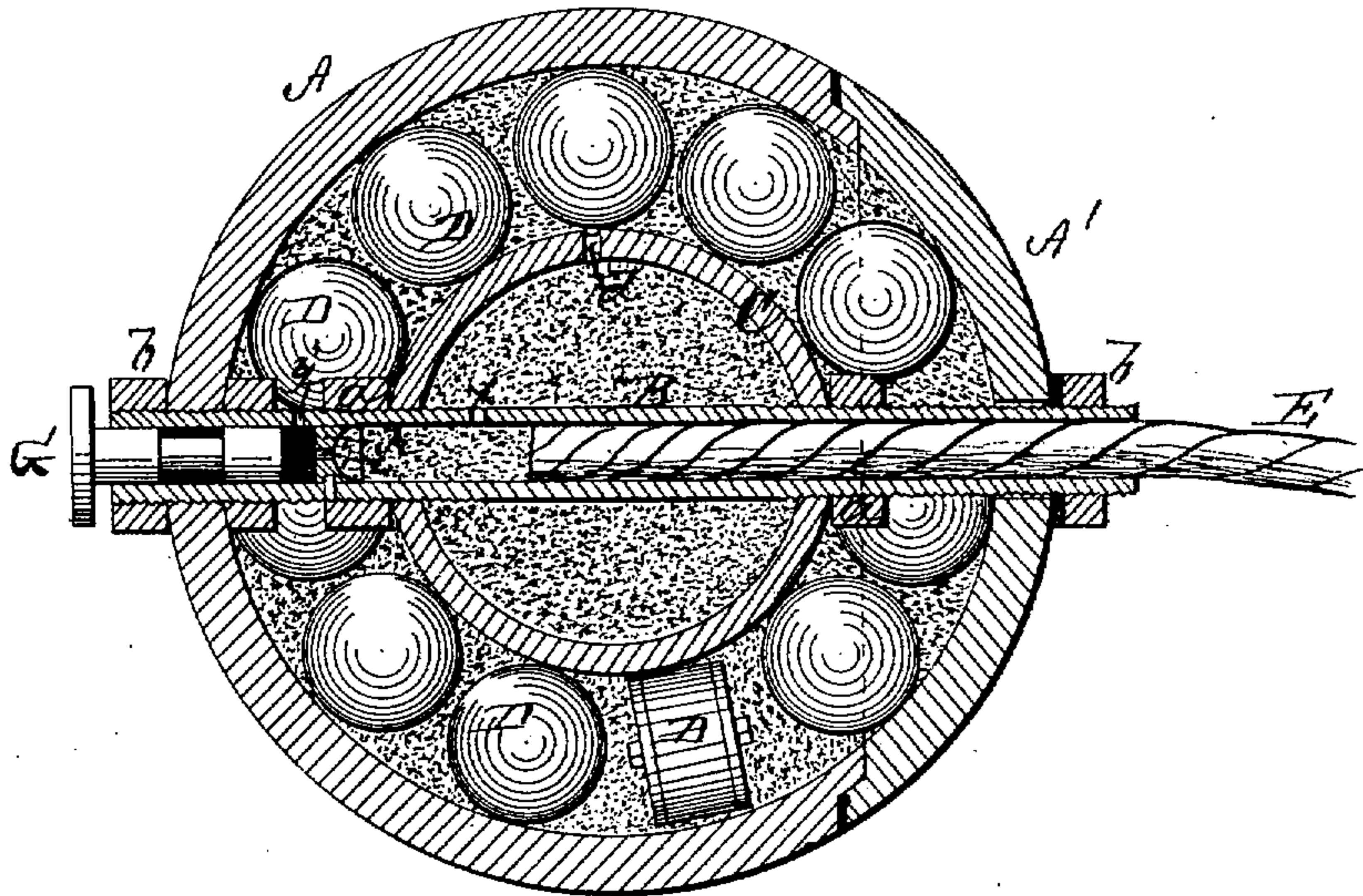


Fig. 2.

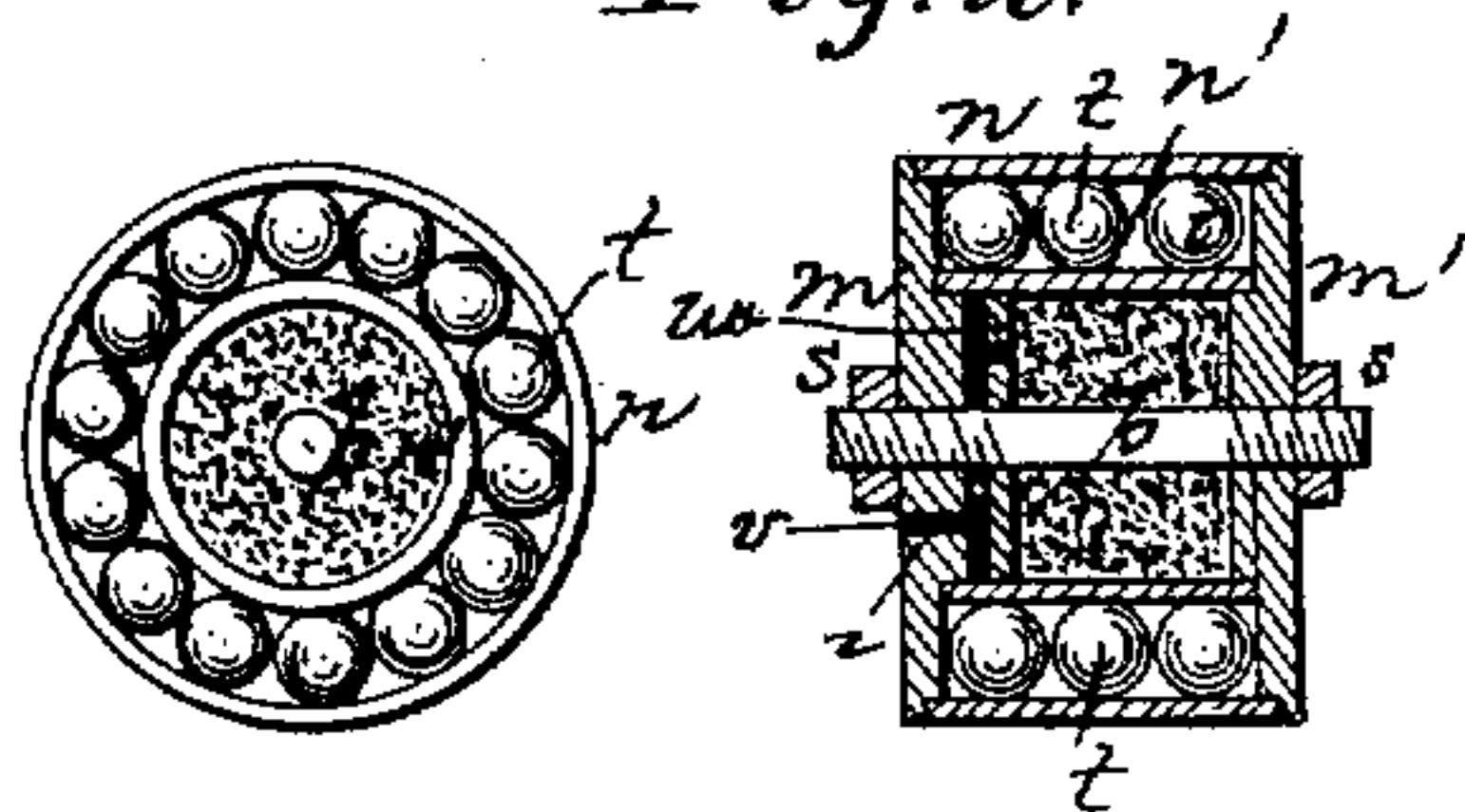
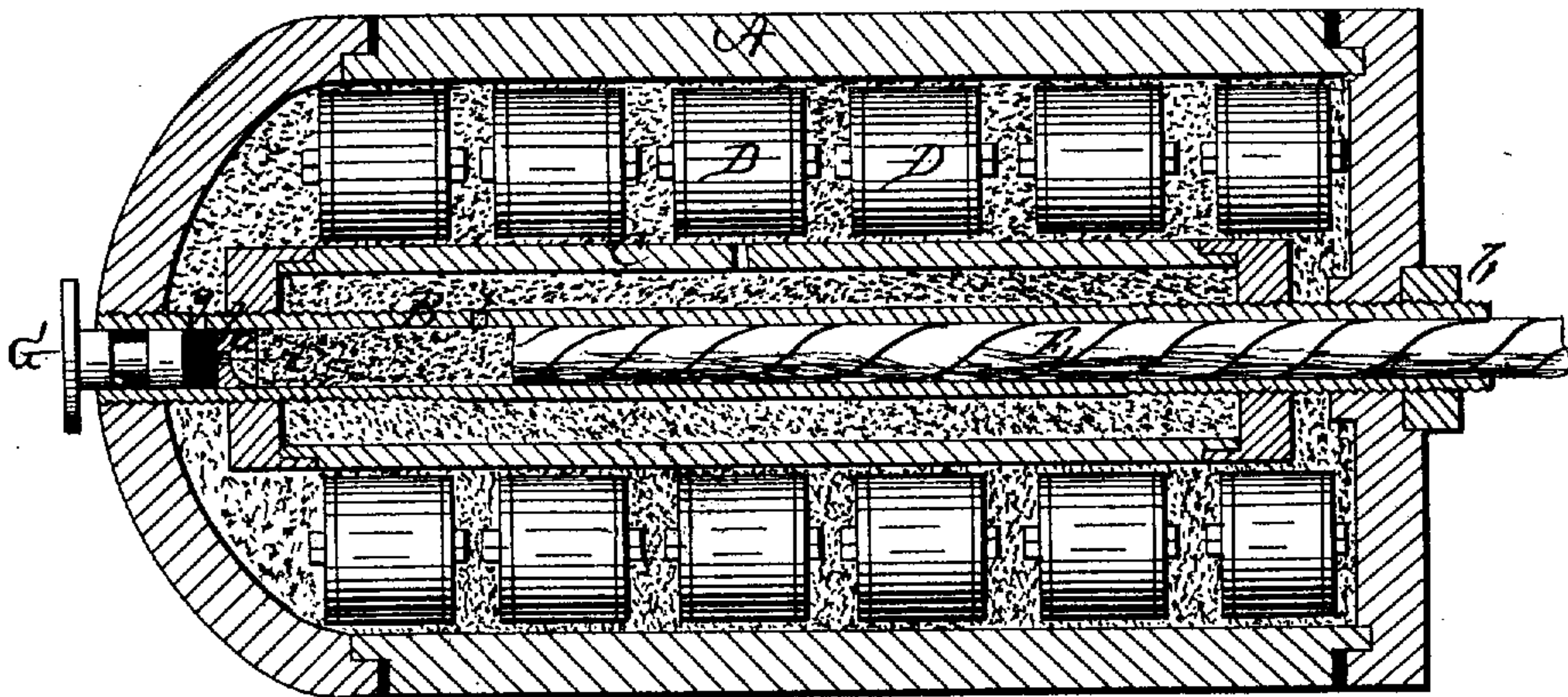


Fig. 3.



WITNESSES

Henry N. Miller By
Q. L. Ewert.

INVENTOR

Hiram Tyler
Attorneys

UNITED STATES PATENT OFFICE.

HIRAM TYLER, OF GENESEO, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO
WARD V. RANGER, OF SYRACUSE, AND WILLIAM H. KELSEY, OF GENESEO,
NEW YORK.

IMPROVEMENT IN EXPLOSIVE SHELLS.

Specification forming part of Letters Patent No. **174,325**, dated February 29, 1876; application filed
August 20, 1875.

To all whom it may concern:

Be it known that I, HIRAM TYLER, of Geneseo, in the county of Livingston and in the State of New York, have invented certain new and useful Improvements in Explosive Shell; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to shells for cannons; and it consists in a shell within a shell, with smaller shells or balls placed in the space between the two shells. It also consists in the combination of parts, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal section of a spherical shell embodying my invention. Fig. 2 shows the construction of the smaller or intermediate shells. Fig. 3 is a longitudinal section of an elongated shell embodying my invention.

A A' represents a spherical shell of any suitable dimensions made in two sections, the edges of the two sections overlapping each other, and suitable packing inserted between them to make a gas-tight joint. B is a tube passed through the centers of the two sections, and having nuts *b b* screwed upon its ends, thereby connecting the two sections of the shell firmly together. Before thus uniting the two sections of the outer shell a smaller shell, C, is placed on the tube B, and held in the center thereon by means of jam-nuts *a a*. In the space or chamber formed between the two shells A A' and C are placed a number of smaller intermediate shells, D D, and the remainder of said space or chamber, as well as the entire shell C, are filled with powder. In the inner shell C is a vent, *d*, forming communication between the two charges. In the inner end of the central tube B is inserted a fuse, E, which extends inward to about the center

of the tube. A suitable distance from the outer end of the tube, within the same, is secured an anvil, *h*, with vent *i* through it. The space or part of the tube between the anvil *h* and inner end of the fuse is filled with powder, and in this part of the tube is a vent, *x*, communicating with the charge in the inner shell C. In the outer end of the tube B is inserted a plunger, G, for igniting fulminate placed between it and the anvil by percussion.

In Fig. 3 I have shown an elongated shell constructed on the same principle as described for the spherical shell, the two main shells in this case, however, being made of three sections instead of two. The number of sections of which the shell is made is immaterial.

When this shell is fired from a cannon, mortar, or other ordnance, it is exploded either by percussion or by the fuse, or both, and as the inner shell C bursts, it, in addition to the charge between the two shells, scatters the smaller or intermediate shells or balls in every direction, and gives them an impetus that carries them beyond the point where the main shell exploded. It will, of course, be understood that the two main shells explode simultaneously. If the shell is exploded by percussion the fire is communicated through the vent *i* to the interior of the tube B, and through a vent, *y*, to the space between the two main shells.

The intermediate shells D are, preferably, constructed of two heads, *m m'*, having each on the inner side two concentric circular shoulders, which form inner bearings for two cylinders, *n n'*, and the parts are held together by a central bolt, *p*, with nuts *s* on the ends. The shoulders on the heads, against which the cylinders are placed, prevent said cylinders from collapsing by the explosion around the shell in the main shell. The space or chamber between the two cylinders is filled with a number of small balls, *t*, as shown in Fig. 2. In the head *m* is a vent, *z*, in which is placed a fuse, *v*, passing on the inner side of said head, and through a hole in a plate, *w*, placed loosely on the rod *p*, the space between said plate and

the opposite head m' within the inner cylinder n' being filled with powder.

Now, as the intermediate shells $D D$ are thrown outward by the explosion of the main shells the fuse v is ignited and burns comparatively slow, but soon ignites the charge in the inner cylinder n' , exploding the shell and scattering the balls t in all directions. As soon as the charge is ignited the plate w at once closes the vent z , so that the full force of the powder is exerted on the explosion of the shell and the scattering of the balls.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A shell for ordnance, consisting of a shell within a shell, both forming chambers and both containing powder, communicating one with the other, and a number of intermediate

shells or balls placed between the two main shells, and surrounded with powder, substantially for the purposes herein set forth.

2. The combination of an exterior sectional shell, $A A'$, an interior shell, C , a central firing-tube, B , extending entirely through both shells, and adapted to receive either a time or percussion fuse, or both, when desired, and a number of intermediate shells or balls, D , placed between the two main shells, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 18th day of August, 1875.

HIRAM TYLER.

Witnesses:

H. A. HALL,
J. M. MASON.