S. Gardiner,
Shell.

No 40,468. Patented Nov. 3, 1863.

Fig. I.

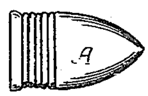

Fig. II.

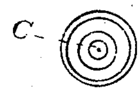

Fig. III.

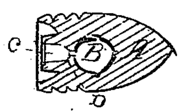

Fig. IV.

Fig. V.

Fig. VI.

Witnesses
Chas Smith
T. Schelley

S. Gardiner Jr
By Attorney

UNITED STATES PATENT OFFICE.

SAMUEL GARDINER, JR., OF NEW YORK, N. Y.

IMPROVEMENT IN CONSTRUCTING HOLLOW PROJECTILES.

Specification forming part of Letters Patent No. **40,468**, dated November 23, 1863.

To all whom it may concern:

Be it known that I, SAMUEL GARDINER, Jr., of the city, county, and State of New York, have invented a new and useful Improvement in Explosive Projectiles for Muskets and other Small-Arms, as also for Cannon of Small or Large Caliber; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of an explosive shell for muskets and other small-arms. Fig. 2 is an end view of the same, showing the fuse-chamber. Fig. 3 is a longitudinal sectional view, representing the shell, ready for filling. Figs. 4 and 5 are perspective views of the two parts of a cup made in two halves, which are to be soldered together to form the chamber which holds the explosive substance or compound. Fig. 6 is a sectional view of the said cup, representing a small hole in each end, through which a mandrel is inserted to support the cup in the center of the mold. The said mandrel also forms the small hole leading from the fuse to the chamber which holds the explosive substance or compound.

Similar letters of reference in each of the several figures indicate corresponding parts.

The nature of my invention consists in manufacturing musket and other small-arm shells, forming and casting the shell complete and at one operation, which is done successfully by forcing the heated metal into the mold by a force-pump placed in connection with the reservoir of heated metal. The machine is similar to a squirt used by type-manufacturers. The material used in manufacturing the shells is lead or any other material that will expand enough to fill the grooves of the gun, and at the same time, when the explosion takes place, to break into several parts. I recommend using a fuse which is perfectly safe in the hands of the parties who may fire it, and is more certain in its explosion, as the fuse-mixture can be so arranged as to explode in one, two, three, or more seconds. Explosive caps may also be used to set fire to the explosive material. They are not safe to handle or transport. Therefore I recommend fuse instead.

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

A is the body of the shell, made of lead or any other material which will flow freely into the mold.

B is the inside chamber for holding the explosive substance or compound. It is made of copper or any other material.

C is the cavity which holds the fuse material.

D is the small hole leading from the fuse C to the inner chamber, B. A cartridge is attached in the usual manner to the shell. When the musket or gun is fired, the powder ignites the fuse, which will burn one or more seconds, as the time of burning the fuse may have been arranged. When the explosive material in the cup is ignited, the shell immediately explodes.

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

Constructing shells for fire-arms by forcing the metal into the mold around an internal shell, B, supported on a mandrel, F, all as hereinbefore described.

In testimony of which invention I hereunto set my hand.

SAML. GARDINER, JR.

Attest:

M. M. LIVINGSTON,
J. W. COOMBS.