M. SHAW.

Projectile.

No. 16,753. Patented Mar. 3, 1857.

Fig: 1.

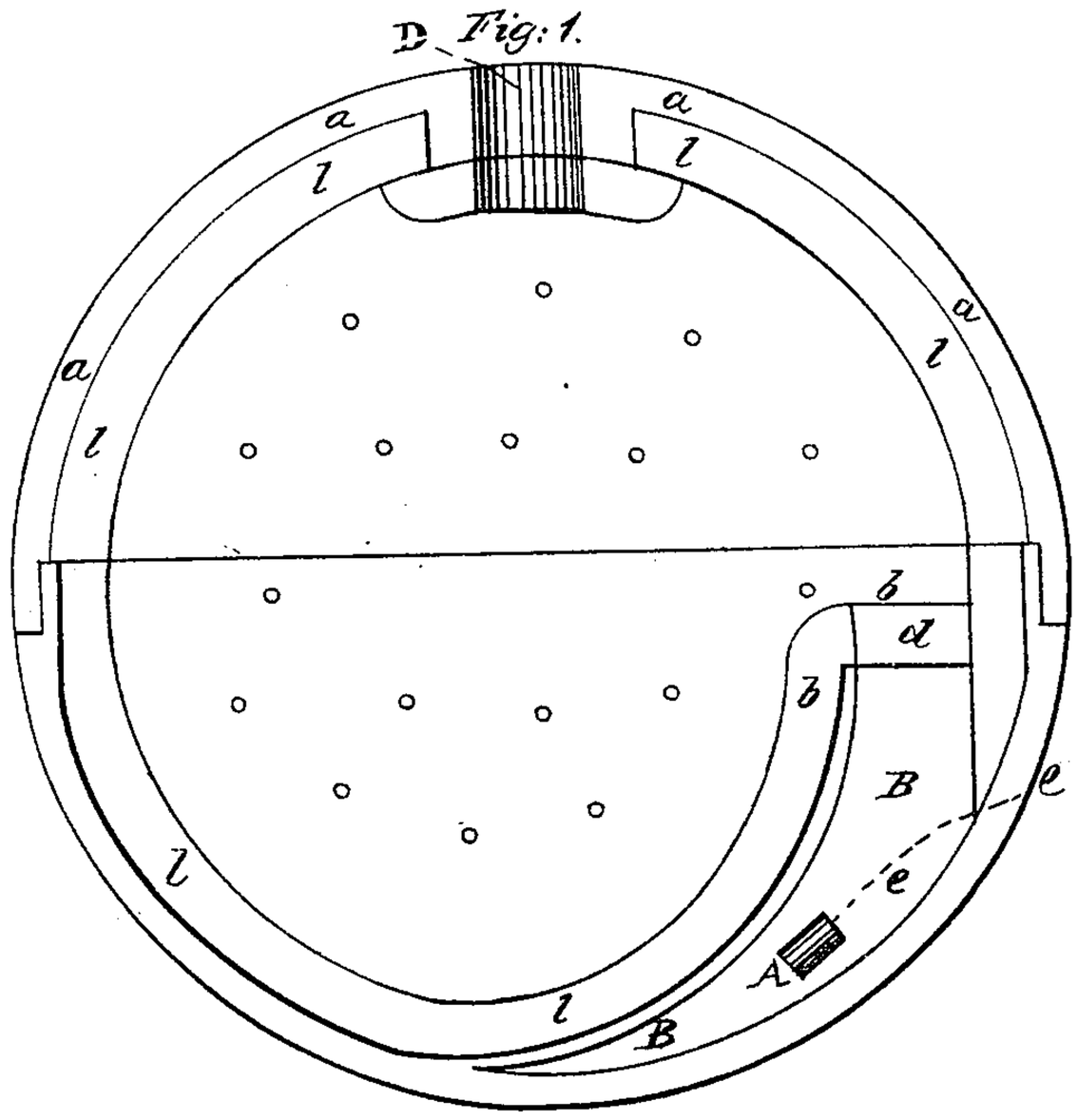
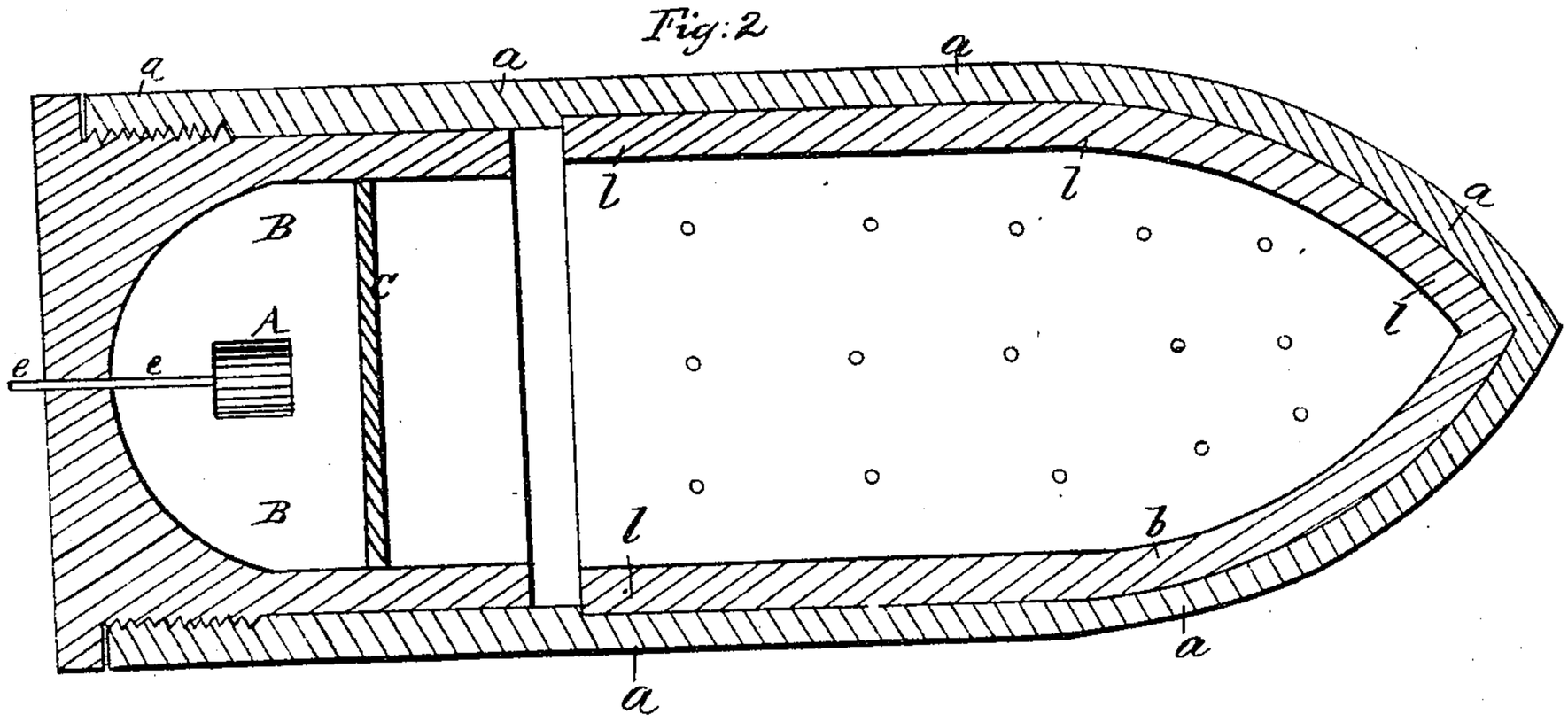


Fig: 2



UNITED STATES PATENT OFFICE.

MALCOM SHAW, OF SANDWICH, MASSACHUSETTS.

IMPROVEMENT IN PROJECTILES.

Specification forming part of Letters Patent No. **16,753**, dated March 3, 1857.

To all whom it may concern:

Be it known that I, MALCOM SHAW, of Sandwich, in the county of Barnstable and State of Massachusetts, have invented a new and improved method of inclosing and confining liquid or melted iron in such a manner that it may be discharged from cannon or mortar, in combination with such means as shall cause the bursting of the confinement at the required time for the execution of its injury to the enemy; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and the letters of reference marked thereon, the same making a part of this specification, in which—

Figure 1 is a sectional view of the arrangement as adapted to round shot, and Fig. 2 its application to shot of "slug" shape.

The nature of my invention consists in having the balls or shells cast hollow and of proper thickness, and in lining the same with a non-conducting composition, so that being filled with liquid iron the heat may not be allowed to escape, which would cause the iron to become solid; also, in providing the balls or slugs with pockets containing explosive materials, to be ignited by a fuse at the required time, which shall cause the bursting of the shells and the scattering of their contents.

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

a a a, Figs. 1 and 2, represent the shell of cast-iron, which should be of thickness proportioned to the size of ball. *b b* is a coating or lining of non-conducting composition spread evenly over the surface of the iron, which protects the outward shell from the heat of the liquid iron. This composition I compose of pipe-clay, black lead, Lehigh coal, and charcoal in equal proportions, and after being spread upon the iron I wash it over with black-lead in water.

A A represent a canister of gunpowder, to which is attached the fuse *e e*, leading to the outside of the shell. This canister is first wrapped in woolen cloth, then around the cloth an envelope of leather, and placed in the pocket B B, which is afterward packed full of a mixture of sand and clay, and in case of Fig. 1 is closed by a screw-plug, *d*. In case of Fig. 2, the canister, being wrapped and enveloped as before, is placed in the pocket and surrounded with the packing of sand and clay to *c c*, which is an iron plate or disk, which being slipped into the pocket, the packing is completed with this mixture and the surface washed with the black-lead wash.

The operation is as follows: Fig. 1 being cast in halves, and properly charged and lined, as set forth, is confined together by proper means, as screws, pins, &c. At the time it is to be used the liquid iron is poured through the opening D, which being closed, the ball is introduced into the cannon or mortar, which is loaded and discharged as in ordinary cases. The fuse *e*, taking fire, continues to burn until it reaches the gunpowder, which explodes, bursting asunder the inner shell of the pocket, which is purposely made thinner than the outer shell, afterward bursting the outer shell and scattering the contents. In case of Fig. 2, the shell being prepared as in Fig. 1, and the liquid iron poured in at the back end, the pocket B is then screwed in by means of a thread cut upon the shell and pocket, after which it is loaded and discharged as before, with the same effect. The small holes represented in the shell are for vents to allow the escape of gases which may be forming in composition lining, thus preventing premature explosion.

I am aware that double shells with separate chambers for explosive and incendiary materials have been used. I therefore do not claim such, independent of the devices combined therewith; but

What I do claim is—

The improvement upon this kind of shell, whereby I am enabled to use melted metal as the incendiary material, and which consists in lining the chamber of the incendiary material with some non-conducting and refractory substance—such as pipe-clay, black-lead, &c.—and perforating the iron to allow the escape of the gas therefrom, thereby providing against premature explosion and retaining the heat in the melted metal.

MALCOM SHAW.

Witnesses:

JOHN C. ELLIS,

SETH F. NYE.