2 Sheets—Sheet 1.

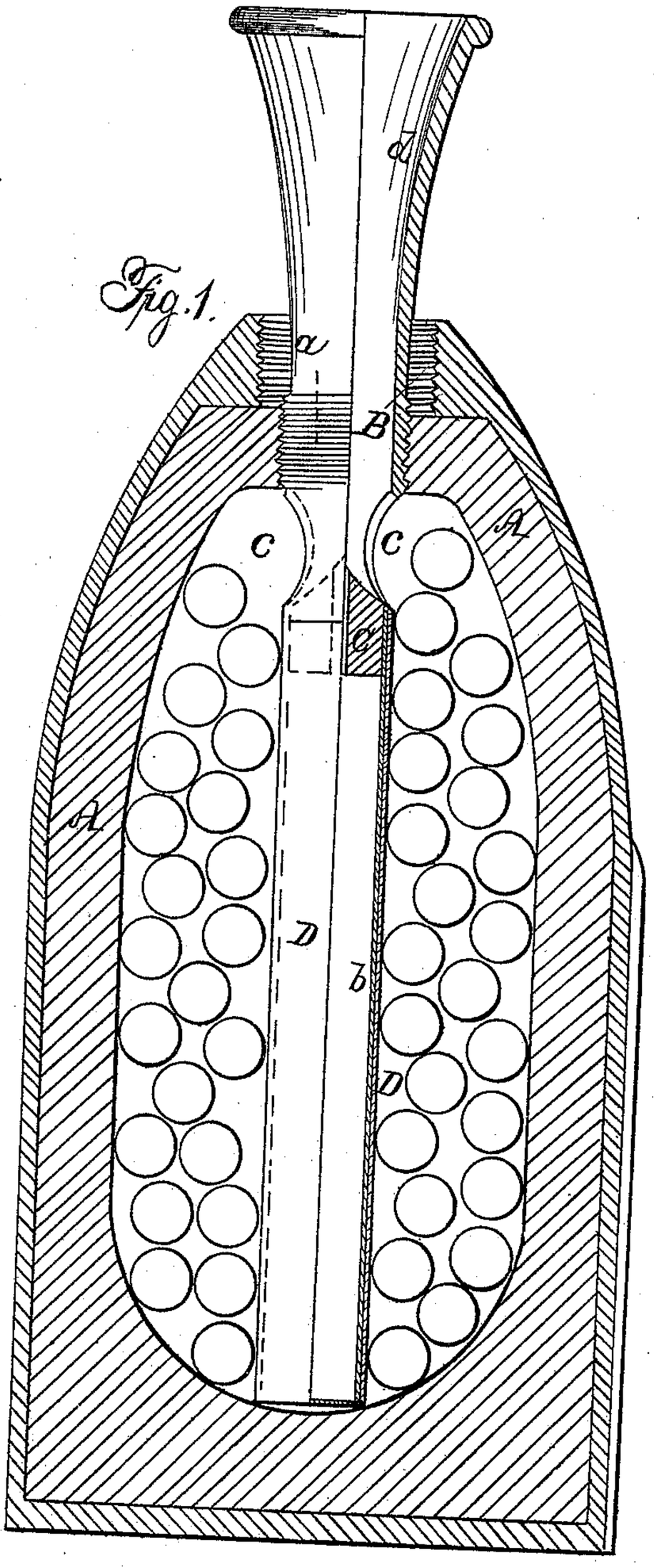
S. SAWYER.

Loading-Mandril.

No. { 3,037, / 34,041. }

Patented Dec. 24, 1861.

Fig. 1.



Witnesses;

Wm. C. Gibbons

Allen. Edwards

Inventor;

Sylvanus. Sawyer.

2 Sheets—Sheet 2.

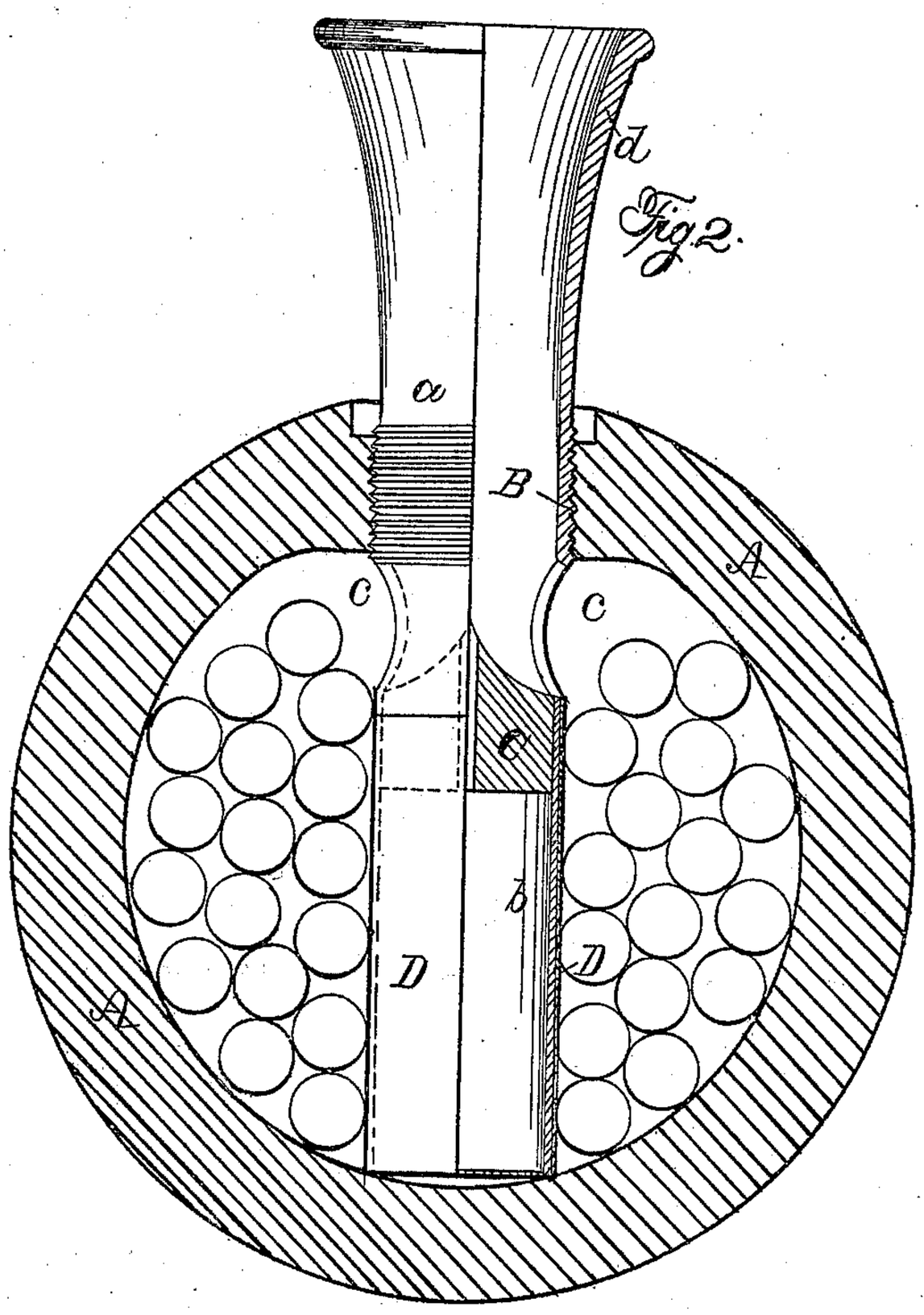
S. SAWYER.

Loading-Mandril.

No. { 3,037, / 34,041. }

Patented Dec. 24. 1861.

Fig. 2.



Witnesses;

M. C. Hebbeen

Allen Edwards

Inventor;

Sylvanus Sawyer

UNITED STATES PATENT OFFICE.

SYLVANUS SAWYER, OF FITCHBURG, MASSACHUSETTS.

IMPROVEMENT IN MANDRELS FOR LOADING CASE-SHOT, &c.

Specification forming part of Letters Patent No. 34,041, dated December 24, 1861.

To all whom it may concern:

Be it known that I, SYLVANUS SAWYER, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Loading Ordnance-Shells; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, taken in connection with the accompanying drawings, making part of this specification, in which.

Figure 1 represents the application of my invention to the shell patented to me November 13, 1855, with the "loading-mandrel" in the position in which it is used to introduce the balls or other matters within the shell; and Fig. 2 represents the application of the invention to an ordinary spherical shell.

The subject-matter of my invention relates to an improved method of introducing and fixing the charge in an ordnance-shell by which the work is more readily and perfectly accomplished than by the means heretofore in use. By the ordinary mode of loading, the shell is first filled with leaden balls, and the interstices are then filled with melted sulphur, rosin, or other similar material, to fix them. A hole is then bored through the center of the mass through the fuse-hole, to form a cavity to receive the bursting-charge. By this means some of the balls are disfigured, and also sometimes loosened, so that they have to be removed, which causes the shell to be out of balance, and thus diminishes both the range and accuracy of its flight.

My invention consists, in the first place, in forming a central chamber or cavity for the bursting-charge within the mass of missiles by means of an instrument which I term a "loading mandrel," which is inserted or screwed into the fuse-hole of a shell and thereby fixed in a central position, around which the balls are packed, and through which they are introduced in a manner to be hereinafter described, and through which also the fixing material may be introduced, if desired.

My invention consists, in the second place, in the employment, in connection with the mandrel, of a thin case or sheath of tin or other appropriate material which surrounds that part of the mandrel within the shell, which case is left within the shell when the mandrel is withdrawn, and forms a chamber for the powder, and retains the balls in position after the mandrel is removed.

In the drawings, A represents the shell, which in Fig. 1 is of a cylindro-conical form; and in Fig. 2, of the ordinary form of spherical shell.

B is the fuse-hole.

C is the loading-mandrel, shown in position as it is when the shell is to be charged. It is provided at *a*, where it passes through the shell, with a screw which fits the screw in the shell that holds the fuse-stock, which serves to place the mandrel centrally in the shell, and to retain it firmly in that position while the missiles are introduced. The part *b* within the shell is made cylindrical and of a length nearly sufficient to reach from the interior surface of the shell opposite the fuse to within a little more than the diameter of the largest balls with which the shell is to be charged from the fuse-hole. This part is shown as made hollow for the purpose of making it light. The part *d* outside of the shell is formed into a funnel the orifice of which is continued through the screwed part of the mandrel and terminates in two orifices, *c c*, on either side just within the shell, through which the balls or other matters can pass into its cavity.

D is a case or sheath, made of thin tin or other suitable material, which is closed at one end, and is made of a size to pass freely onto the mandrel upon which it is placed when it it is put into the shell, and forms a chamber to receive the bursting-charge. When the shell has been filled with balls and the mandrel withdrawn this case remains in the position that it occupied when the mandrel was inserted, and sustains the balls until they are fixed by pouring in melted rosin or other suitable material; and, being closed at the bottom, it prevents the rosin from entering the interior unless it be filled so as to overflow it.

The fixing material may be introduced, if desired, before the mandrel is withdrawn; but I regard the mode of manipulation which I have just described as the more neat and convenient.

The form and dimensions of the mandrel will require to be modified to adapt it to shells of different kinds and sizes; but the two shown in the drawings will, I conceive, sufficiently

explain the principle of its construction and use. And in regard to the tin case or sheath which is placed upon the mandrel, it may be made of any appropriate material; also, the mandrel may be used without the case by covering it with some repellant substance which will prevent the fixing material from adhering to it, in which case the mandrel must be left in the shell until the fixing material has hardened.

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

1. The loading-mandrel, constructed substantially as described, as an instrument for loading ordnance-shells or any other analogous use.

2. The employment, in combination with the loading-mandrel, of a case or sheath, substantially as described.

October 30, 1861.

SYLVANUS SAWYER.

Witnesses:
WM. C. HIBBARD,
OLIVER EDWARDS.