

E. G. HOWE.
 APPARATUS FOR CLOSING VESSELS IN VACUUM.

APPLICATION FILED SEPT. 10, 1900.

NO MODEL.

Fig. 1.

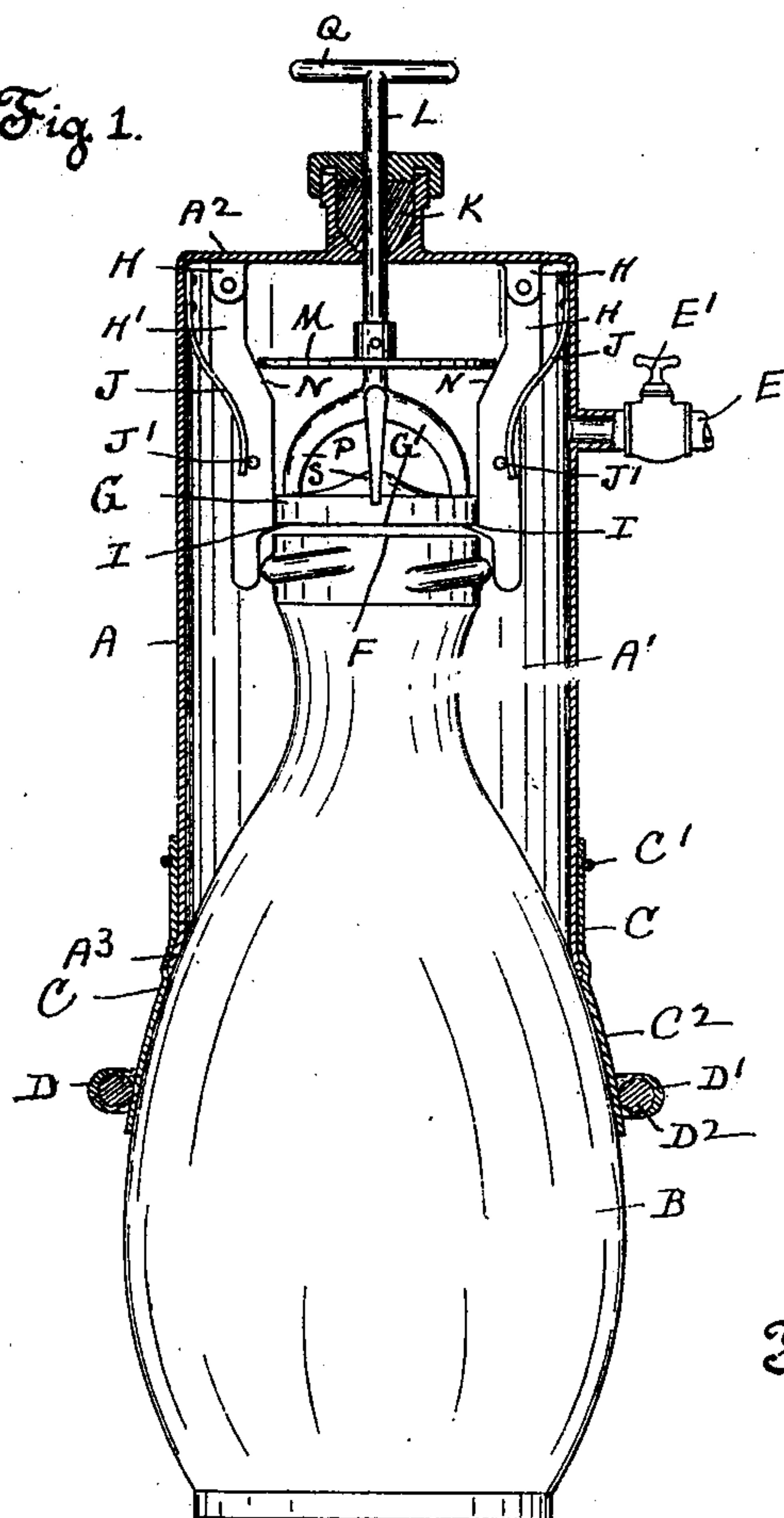


Fig. 2.

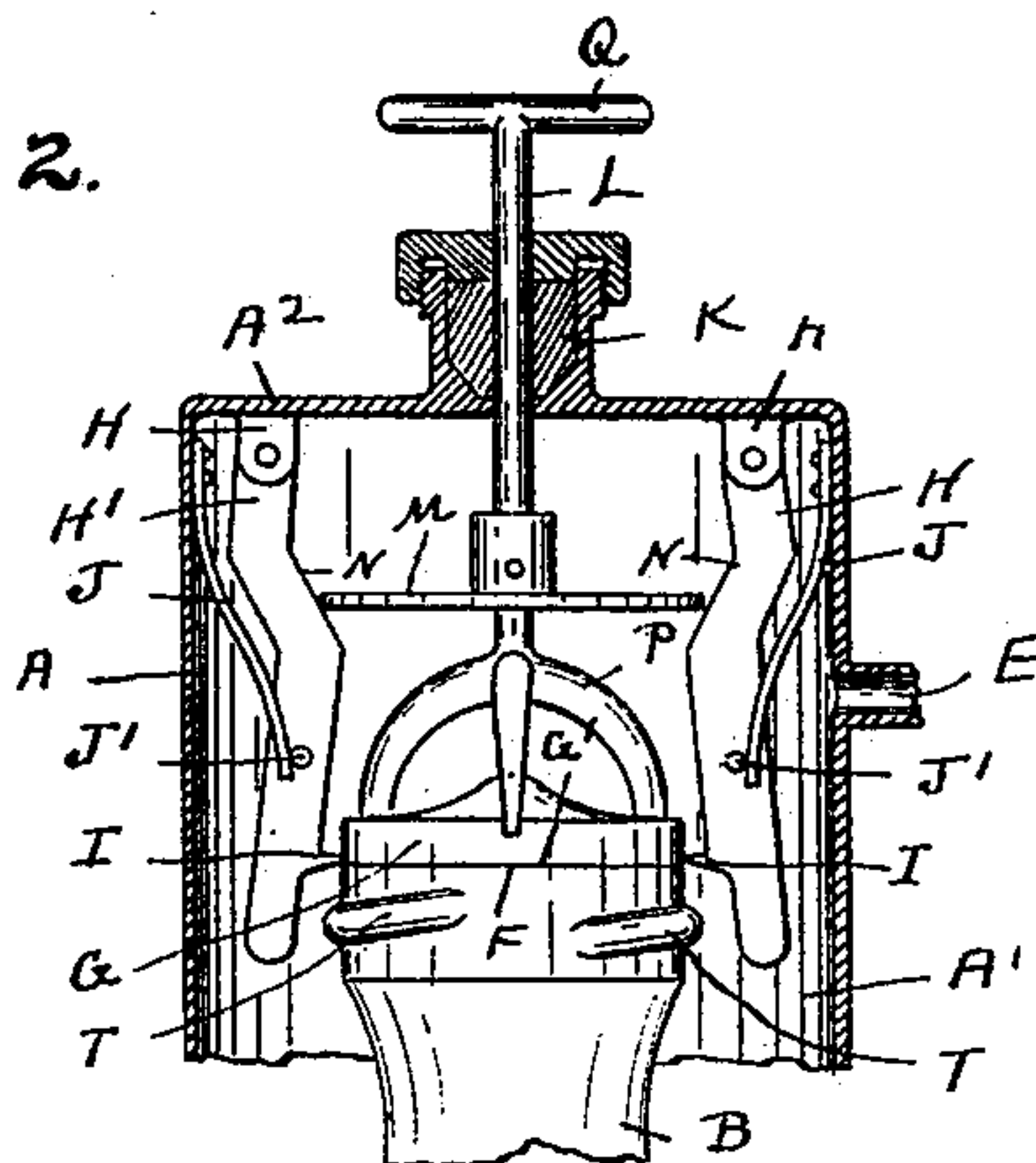


Fig. 3.

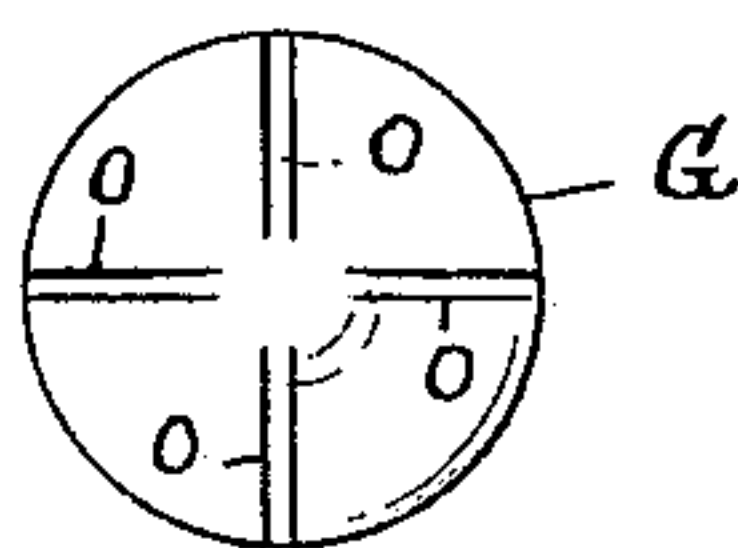
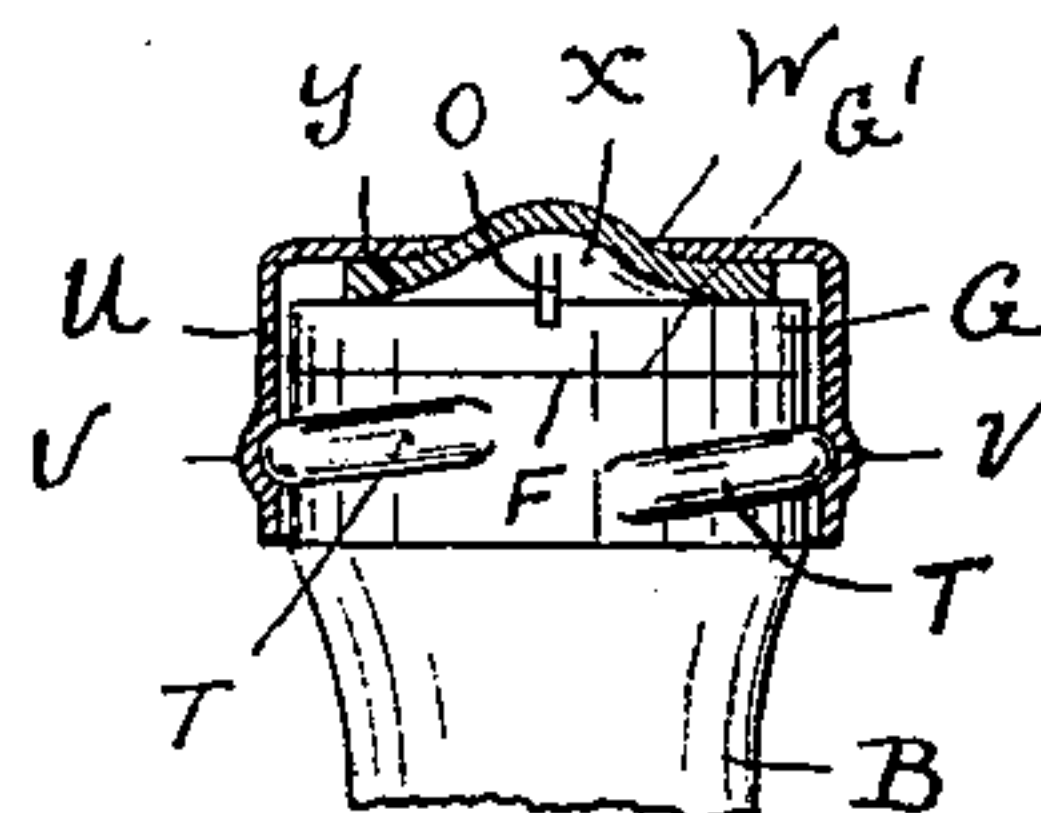


Fig. 4.



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UNITED STATES PATENT OFFICE.

ELBRIDGE G. HOWE, OF MILLBURY, MASSACHUSETTS.

APPARATUS FOR CLOSING VESSELS IN VACUUM.

SPECIFICATION forming part of Letters Patent No. 725,967, dated April 21, 1903.

Application filed September 10, 1900. Serial No. 29,482. (No model.)

To all whom it may concern:

Be it known that I, ELBRIDGE G. HOWE, a citizen of the United States, residing at Millbury, in the county of Worcester and Commonwealth of Massachusetts, have invented new and useful Improvements in an Apparatus for Closing Vessels in a Vacuum, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a bottle with the apparatus embodying my invention applied thereto, said apparatus being shown in central vertical sectional view. Fig. 2 represents the upper portion of the apparatus in sectional view, with the mouth of the bottle closed. Fig. 3 is a top view of the glass cover by which the mouth of the bottle is closed. Fig. 4 represents the mouth of the bottle closed by the glass cover shown in Fig. 3, with a screw-threaded metal cap applied thereto and having a yielding cushion between the metal cap and the glass cover, said cap and cushion being shown in sectional view.

Similar reference-letters refer to similar parts in the different views.

The object of my present invention is to provide means for closing bottles, jars, or other vessels after the air has been exhausted therefrom in order to preserve the contents in a vacuum; and it consists in the construction and arrangement of parts, as hereinafter described, and set forth in the annexed claims.

Referring to the drawings, Fig. 1 represents my improved apparatus as applied to a bottle from which the air is to be withdrawn by a suitable air-pump (not shown) and the bottle closed while the vacuum is preserved.

A denotes a case or shell conveniently made from sheet metal and inclosing a chamber A'. The case A is closed at its upper end A² and open at its lower end A³, which is preferably adapted to rest upon the bottle B or other receptacle from which the air is to be withdrawn. Attached to the lower end A³ of the shell A is a flexible band C, suitably attached to the shell A, in the present instance by a

by a clamping-ring D, preferably consisting of an annular metal shell D', crescent-shaped in cross-section and having a yielding or rubber cushion D², adapted to press against the band C² and hold it in close contact with the surface of the bottle in order to form an air-tight joint. From the upper portion of the shell or case A a pipe E, having a stop-cock E', leads to an air-pump (not shown,) by which air is exhausted from the chamber A', and also from the bottle B. The mouth of the bottle B is provided with a ground surface F to receive a ground surface G' upon the under side of a cover G, preferably of glass, by which the mouth of the bottle is closed after the air has been exhausted. The shell A is provided with lugs H, to which blades H' are pivoted, provided with shoulders I, adapted to support the cover G and hold the same out of contact with the surface F of the bottle. Springs J are attached to the case or shell A and bear against pins J' on the blades H' in order to hold the shoulders I in engagement with the cover G. The shell or case A, with the cover G supported upon the shoulders I, as represented in Fig. 1, is placed in position upon the bottle B, an air-tight joint is made between the band C and the surface of the bottle, and the air is exhausted through the pipe E by means of an air-pump from the chamber A' and the bottle B. The case or shell E is provided with a stuffing-box K to receive a spindle L, carrying a disk M, with its edge bearing against the inclined edges N of the blades H', so that by pushing the spindle L downward the blades H' are crowded outwardly, thereby releasing the cover from the shoulders I and allowing it to fall upon the surface F of the bottle in the position shown in Fig. 2. The cover G is provided with grooves O on its upper face, adapted to receive the prongs of a fork P, carried by the lower end of a spindle L, so that when the cover G has been placed upon the surface F of the bottle a slight rotation of the spindle L by means of a handle Q will rotate the cover and cause it to firmly seat itself upon the ground surface F of the bottle.

If desired, the surfaces F and G' may be covered with some cement or oily substance before the contact of the cover with the band. When the cover G has been placed in posi-

tion, as above described, the shell A may be removed from the bottle and the cover will be held firmly in position by the pressure of the atmosphere upon its upper surface S. In order to prevent the displacement of the cover after the bottle has been closed, I provide the bottle with spiral ribs T and apply a metal cap U, preferably formed of sheet metal and having spiral internal recesses V, by which the sheet-metal cap U may be screwed upon the bottle and against the top of the cover G. The metal cap U is provided at the top with a central hole W, and the top of the cover G is provided with a concentric conical projection X, which extends from the opening W when the cap U is screwed in place. A rubber or yielding washer Y is preferably interposed between the cover G and the metal cap U to secure a yielding pressure of the cap upon the cover.

When the metal cap U has been screwed in place, the cover G is held from lateral movement by the projection of the cone X and yielding washer Y through the opening W of the cap. In many cases it will be sufficient to simply release the cover G by turning the blades H' apart without rotating the cover upon the mouth of the bottle, allowing the cover to fall by gravity upon the bottle, where it will be held in position by the pressure of the atmosphere as soon as air is admitted to the chamber A'.

My improved apparatus is designed to securely close the mouth of a bottle or other vessel after the air has been exhausted and while the vacuum is maintained, and this result is accomplished by providing means for applying the cover G or otherwise closing the bottle while in the vacuum produced by exhausting the air from the bottle, and to this end I provide means for supporting the cover for closing the bottle over the opening of the bottle, so that it may be released and allowed to fall by gravity into the proper position to close the bottle while the vacuum is still maintained; but I do not wish to confine myself to the use of the specific device shown, consisting of the spring-actuated blades H', as other means for supporting the cover may be employed without departing from the scope of my invention.

By the within-described apparatus I support the cover out of contact with the mouth

of the bottle during the operation of pumping; but I can allow the cover to rest upon the mouth of the bottle and exhaust the air from the chamber A', as the pressure of the air in the bottle will lift the cover and escape; but I am able to produce a more complete vacuum in the bottle by maintaining a communication between the chamber A' and the bottle B during the pumping.

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

1. In an apparatus for closing vessels in a vacuum, the combination of a shell or case adapted to inclose the mouth of the vessel and form an air-tight joint with the vessel, means for supporting a cover within said shell above its mouth and means for releasing said cover from its support, whereby the cover is allowed to fall by gravity and close the mouth of the vessel, substantially as described.

2. The combination of a shell or case inclosing an air-tight chamber surrounding the mouth of the vessel, a cover for closing the mouth of the vessel, means for supporting said cover out of contact with the vessel and in position to fall by gravity and close the mouth of the vessel and means for withdrawing the support from said cover, substantially as described.

3. The combination of a shell adapted to inclose the mouth of a vessel, a flexible band attached to and dependent from the lower end of said shell, means for crowding said flexible band against the side of the vessel to form an air-tight joint, means for supporting a cover within said shell and vertically above the mouth of the vessel and means for releasing said cover and allowing it to fall by gravity to close the mouth of the vessel, substantially as described.

4. The combination of a shell, means for forming an air-tight joint between said shell and a vessel inclosed therein, spring-actuated blades hinged in said shell and provided with shoulders adapted to support a cover, and means for separating said blades to release the cover, substantially as described.

Dated this 6th day of September, 1900.

ELBRIDGE G. HOWE.

Witnesses:

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W. C. PRICE.