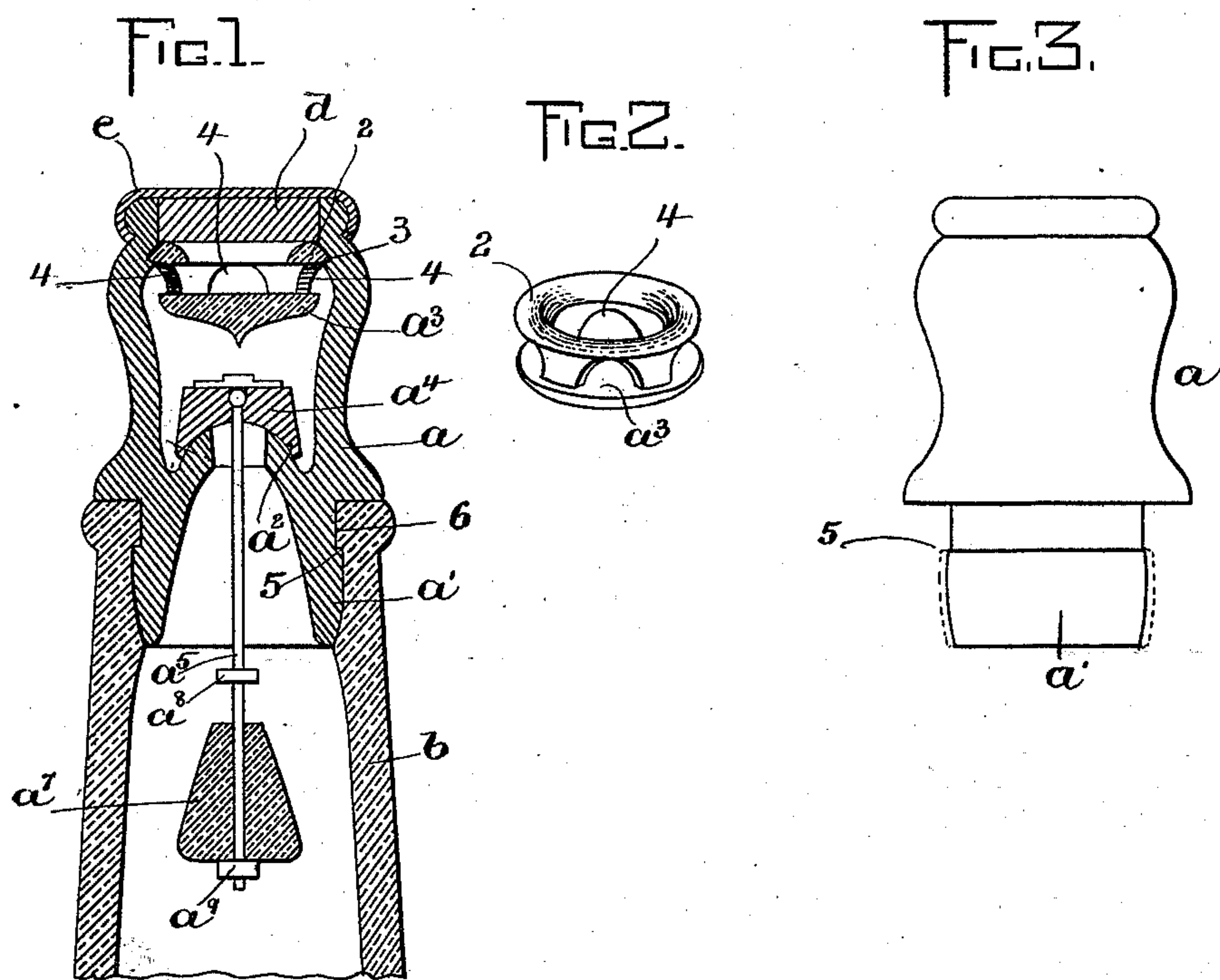


(No Model.)

G. W. STEFFENS.
BOTTLE STOPPER.

No. 561,356.

Patented June 2, 1896



WITNESSES:

A. D. Hamann

Rollin Abell.

INVENTOR:

Geo. W. Steffens
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UNITED STATES PATENT OFFICE.

GEORGE W. STEFFENS, OF BOSTON, MASSACHUSETTS.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 561,356, dated June 2, 1896.

Application filed November 1, 1895. Serial No. 567,596. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. STEFFENS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Bottle-Stoppers, of which the following is a specification.

This invention relates to stoppers or appliances to prevent the refilling of bottles; and it has for its object, first, to provide a simple device of this character adapted to be firmly engaged with the bottle by the action of the liquid contained therein, and of such construction that it cannot be refilled when the bottle is placed in either a horizontal or a vertical position.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a vertical section showing my improved bottle-stopper applied to a bottle. Fig. 2 represents a perspective view of the valve-guard removed from the stopper-casing. Fig. 3 represents a side view of the stopper-casing, showing by dotted lines the compression of the neck of the stopper preparatory to placing it in the bottle and expanding it therein.

The same letters and figures of reference indicate the same parts in all the figures.

In carrying out my invention, I provide a hollow casing a , made of any suitable wood and constructed to serve as a passage or outlet for liquid from a bottle, the casing being provided with a neck a' , adapted to be inserted in the bottle b . The casing is provided internally with a convex valve-seat a^2 , and above said seat with a valve-guard a^3 , constructed to permit the outward flow of liquid through the casing and to prevent the insertion of a wire or other device into the casing for the purpose of tampering with the valve, said guard being preferably constructed as shown in Figs. 1 and 2—that is to say, composed of a disk having an outwardly-projecting lip or flange 2, the margin of which may be engaged with a groove 3, formed in the internal wall of the casing, and orifices 4 formed in the flange 2, the arrangement being such that the guard a^3 prevents a wire inserted in either of said orifices from gaining access to the valve.

a^4 represents the valve, the under side of which is concave to fit the convex seat a^2 , the valve being formed so that it can rock or slide freely on the seat.

a^5 represents a rod which is secured to the valve a^4 , said rod extending downwardly through the valve into the neck of the bottle.

a^7 represents a sliding weight or hammer which is movable between stops a^8 a^9 on the rod a^5 and serves not only as a weight to hold the valve against its seat in all positions of the bottle, excepting when the bottle is inverted and held vertically, but also as a hammer to dislodge the valve from its seat when the bottle is inverted, thus preventing the valve from sticking, as it might be liable to do, particularly if the contents of the bottle contain a considerable proportion of sugar. The weight a^7 may be made of glass and has sufficient freedom of motion between the stops a^8 a^9 to enable it to strike the stop a^8 with considerable force when the bottle is inverted.

It will be seen that when the bottle is held horizontally the weighted arm will drop to the under side of the bottle, the valve moving on but not leaving its seat, so that the valve will not open until the bottle is inverted.

d represents a stopper, of cork or any suitable material, inserted in the outer end of the casing a above the guard a^3 , said stopper closing the outer end of the casing liquid-tight. The stopper d may be held in place by a metallic capsule or cover e , the edge of which may be turned downwardly over a bead formed on the outer end of the casing, as shown in Fig. 1.

At a suitable stage in the manufacture of the casing a , and preferably before the neck a' is internally bored to form the opening therethrough, I subject the said neck to powerful compression by any suitable means, so as to reduce its diameter. The wood of which the casing and neck are made is well seasoned, and the compression, reducing the diameter of the neck from its normal diameter, enables the neck to be readily inserted in the bottle, but causes a greater expansion when the liquid in the bottle saturates the neck than would have been the case without the compression. The neck is therefore expanded

to such an extent that a locking member or shoulder 5 formed thereon interlocks with a corresponding member or shoulder 6 in the bottle and prevents the casing from being withdrawn from the bottle except by breakage. This statement is made with due regard for the fact that the neck may shrink to some extent after its insertion in the bottle, particularly if the bottle is left standing in an upright position for a considerable period. I have found, however, that all the shrinkage possible will not reduce the diameter of the neck beyond its original normal diameter and will not restore the neck to the diameter caused by the compression. Hence, while the pressure of the neck on the interior of the bottle may be somewhat reduced by shrinkage, the neck cannot be disengaged from the bottle. In Fig. 3 I show in full lines the diameter of the neck after the compression thereof, the dotted lines indicating the diameter of the neck before compression. The swelling of the neck after it is inserted in the bottle would expand it to a diameter in excess of that indicated by the dotted lines if the neck of the bottle would permit. The result is that if the interior of the bottle is formed to somewhat closely fit the compressed neck of the casing the engagement of the two parts will be permanent and will be unaffected by any shrinkage of the neck of the casing.

I am aware that corks have been compressed prior to their insertion in bottle-necks; but owing to the elasticity of cork that material cannot be utilized for the purpose of my invention. Furthermore, cork not being a grained wood and being unaffected by liquid, it is not, even when compressed, caused to expand by the action of liquid.

My invention involves the use of a stopper made of seasoned wood having a grain and capable of absorbing moisture, said stopper being provided with a shoulder which is compressed prior to insertion in the bottle-neck, whereby said shoulder, when expanded by the action of liquid, is forced outwardly into immovable engagement with a shoulder in the bottle with a force that cannot be obtained by the use of cork, rubber, or celluloid.

That portion of the stopper containing the valve and valve-guard is entirely above the top of the bottle, and among the advantages of this construction it may be mentioned that it permits of the chamber being made large enough to accommodate a valve considerably

larger than if located within the neck. This projecting portion of the stopper might be grasped with sufficient force to remove the stopper if the latter were made of rubber, celluloid, or non-compressed wood; but owing to the wood being compressed before insertion in the bottle-neck it expands sufficiently to prevent such removal without breakage.

I prefer to impregnate the outer portion of the casing *a* with some composition which will make it impervious to liquid, said composition saturating all parts of the casing excepting the neck *a'*.

I do not limit myself to the details of construction herein shown and described nor to the particular form of the parts, as the device may be varied in all its particulars without departing from the spirit of my invention.

The casing having the compressed neck may be used in connection with any other suitable closing means and is not limited to the closing devices here shown.

I claim—

1. A bottle-stopper comprising a hollow casing of absorbent and expansive material and formed to serve as a conduit and provided with suitable closing means and with a neck of substantially uniform diameter which is compressed and adapted after its insertion in a bottle to expand and form a shoulder caused by the absorption of the liquid.

2. A bottle-stopper comprising a hollow wooden casing provided with a valve-seat, a valve, and a valve-guard having at its lower end a neck of substantially uniform diameter which is compressed and adapted after its insertion in a bottle to expand and form a shoulder caused by the absorption of the liquid.

3. A bottle-stopper comprising a hollow casing provided with a neck capable of expanding when moistened, a convex valve-seat within said casing, a concave valve formed to rock on said seat and provided with a downwardly-projecting rod, having stops rigidly secured thereto, a weight or hammer independent of and fitted to slide on said rod between the stops, and a valve-guard above the valve.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 26th day of October, A. D. 1895.

GEO. W. STEFFENS.

Witnesses:

THEODORE SEUTZ,
C. F. BROWN.