

No. 693,834.

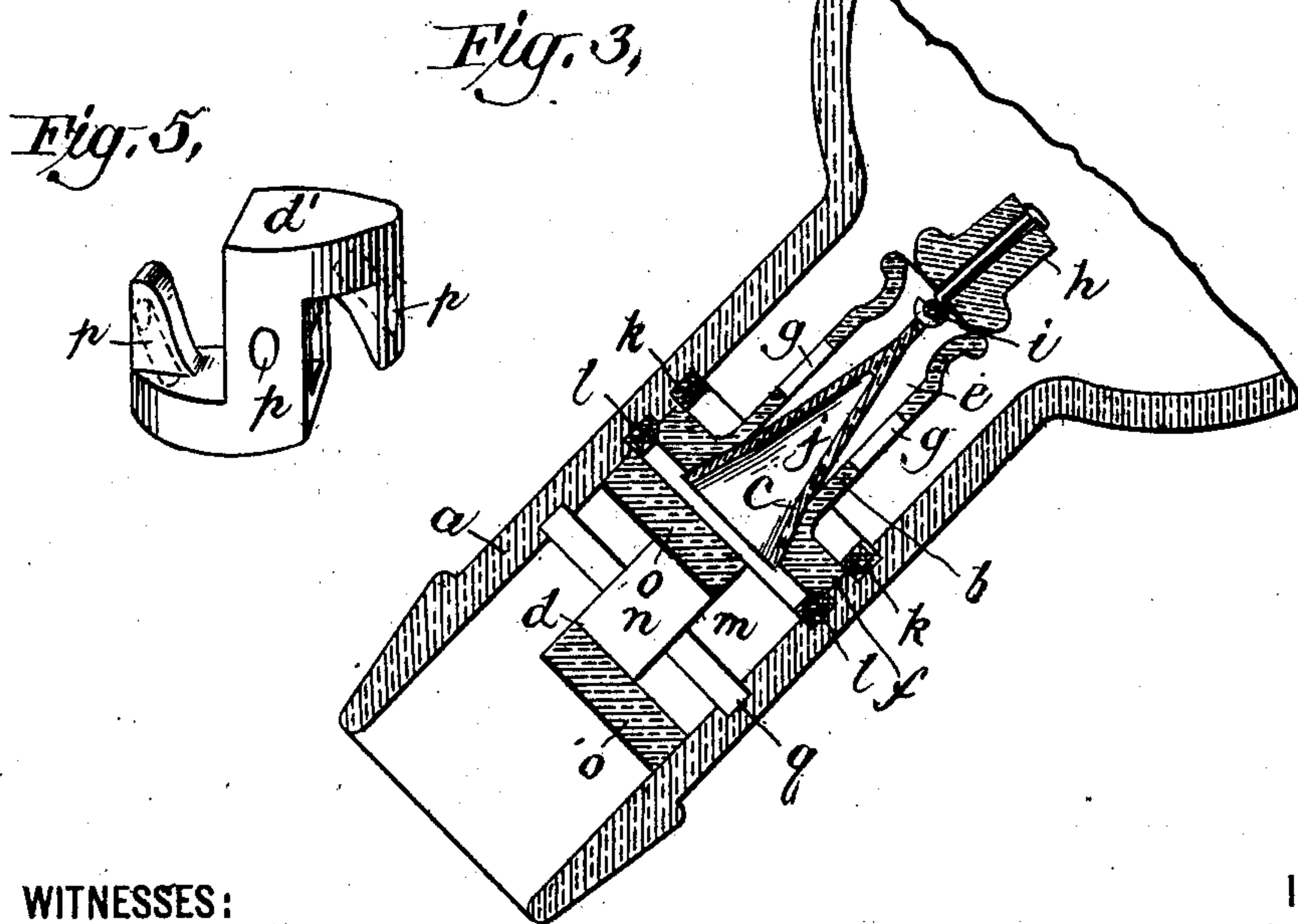
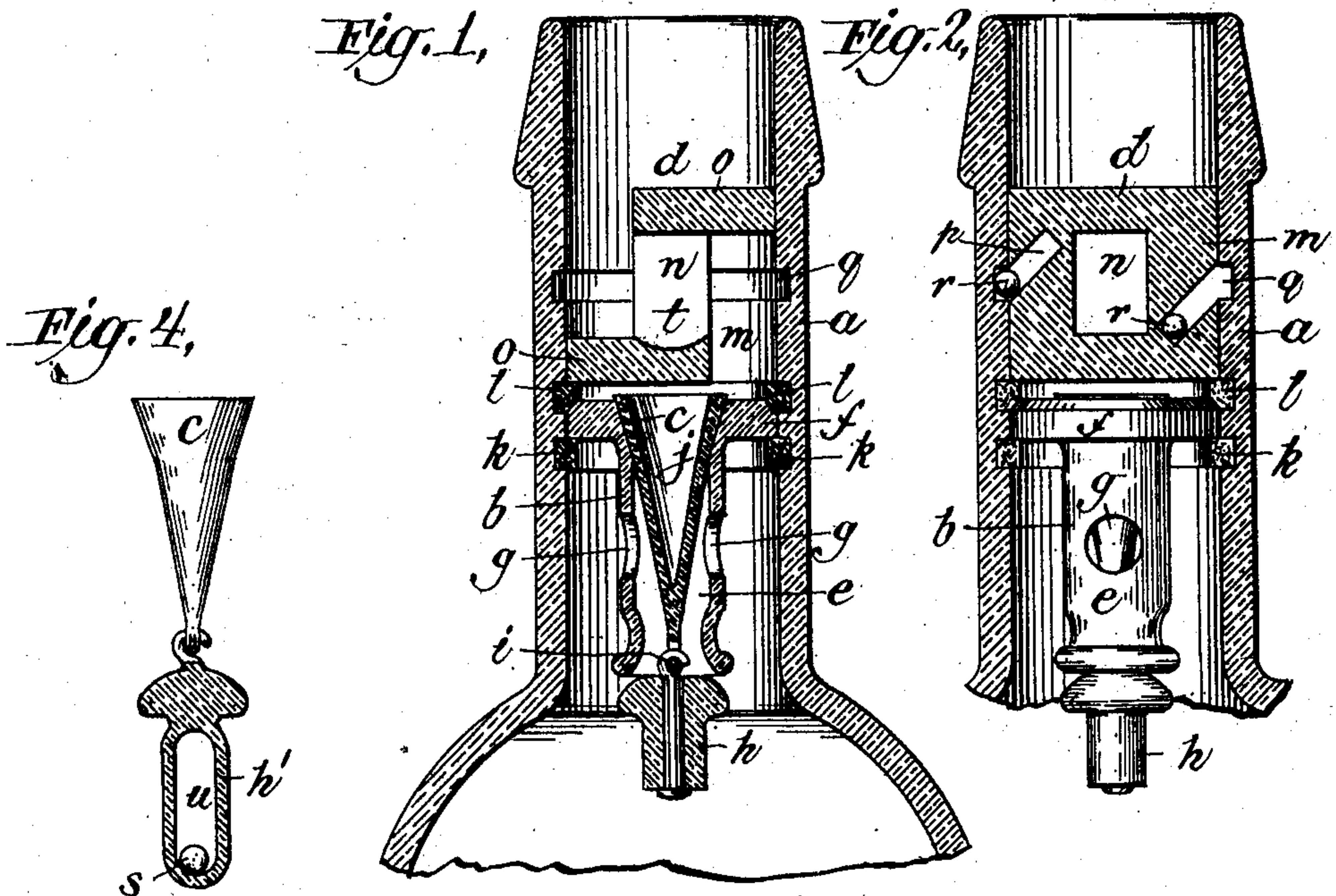
Patented Feb. 25, 1902.

J. W. CALEF.

NON-REFILLABLE BOTTLE STOPPER.

(Application filed June 1, 1900. Renewed Jan. 26, 1901.)

(No Model.)



WITNESSES:

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NON-REFILLABLE-BOTTLE STOPPER.

SPECIFICATION forming part of Letters Patent No. 693,834, dated February 25, 1902.

Application filed June 1, 1900. Renewed January 26, 1901. Serial No. 44,832. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. CALEF, a citizen of the United States, residing at North Easton, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Non-Refillable-Bottle Stoppers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in non-refillable-bottle stoppers; and it consists in the novel construction of the check-valve employed, in the novel guard employed for preventing manipulation or forcing of the valve, and in the novel means employed for preventing removal of the guard when once in place.

The objects of my invention are to improve and simplify the construction of non-refillable-bottle stoppers, to render the stopper proof against filling by shaking and other methods of manipulation, to so design the stopper that it may be formed entirely of glass or similar material which is not acted upon by the substances to be placed in the bottle, to avoid altogether the use of springs and other metal parts, to provide an efficient guard for preventing manipulation of the stopper by a wire or other instrument inserted into the mouth of the bottle, to prevent the removal of the guard when once the same is in place, and generally to make the stopper simple, compact, certain in action, and inexpensive. These objects of my invention are attained in the stopper herein described, and illustrated in the drawings which accompany and form a part of this application, in which the same reference-letters indicate the same or corresponding parts, and in which—

Figure 1 is a central vertical section of the neck of a bottle and of my improved stopper within the same. Fig. 2 is a vertical section of the neck of the bottle and of the guard, taken on a plane at right angles to that of Fig. 1, the valve not being sectioned. Fig. 3 is a central vertical section of the neck and stopper, showing the parts in the positions assumed when the bottle is inverted. Fig. 4 shows a modified form of weight which may

be employed, and Fig. 5 illustrates another form of guard which may be employed.

In the drawings, *a* indicates the neck of the bottle; *b*, the valve-casing; *c*, the valve-plug, and *d* the above-mentioned guard employed for preventing manipulation of the valve by means of an instrument inserted through the neck of the bottle.

The valve-casing *b* consists, essentially, of a tubular portion *e*, having a flanged head *f*, the diameter of which is nearly equal to the internal diameter of the neck of the bottle, and which has in its upper portion a seat for the conical valve-plug *c*. In the sides of the tubular portion *e* are apertures *g g* for the passage of air and liquid. From the lower end of the valve-plug *c* is suspended a weight *h*, the connection between the valve-plug and weight being by means of a hook on one of the said parts engaging an eye on the other of said parts. The weight *h* has a shoulder which is in close proximity to the lower portion of the valve-casing *b* even when the bottle is upright, so that the valve-plug has but little latitude of movement at any time, and therefore cannot be manipulated by shaking the bottle so as to permit entrance of fluid into the bottle, and the shoulder of the weight *h* is arranged to make contact with the edge of the valve-casing when the bottle is inclined slightly and then, with such point of contact as a fulcrum, to pull the valve-plug to or against its seat. The point of connection of the weight *h* to the valve-plug *c* is at all times nearly opposite the point at which the weight touches the valve-casing when the bottle is inclined. This is important, because for this reason and because the connection of the weight to the valve-plug is substantially a pivotal connection, as distinguished from a connection by means of a flexible chain or cord, the pull of the weight upon the valve-plug is approximately along the axis of the valve-casing, and the weight therefore tends to cause the valve to seat perfectly in closing. When the bottle is upright and substantially vertical, the pull of the weight is of course along the axis of the valve-casing, and the weight is at all times in such close proximity to the casing that when the bottle is tilted before the inclination has become sufficient to cause any ma-

terial side pull of the weight on the valve-plug such as might cause sticking of the valve in an open position the weight has touched the valve-casing, after which the pull of the weight again becomes substantially axial.

An important advantage of the pivotal connection of the weight *h* and valve-plug *c* is that it permits the weight, valve-plug, and their connecting parts to be formed entirely of glass or similar material which is not acted upon by the substances to be placed in the bottle. This is not the case if the valve-plug and weight be connected by a chain or cord. In addition the links of a chain are likely to become tangled, thus altering the distance between the valve-plug and weight, and a cord is apt to rot away and break, to which objections the pivotal connection is not subject.

The valve-casing *b* is held in place in the neck of the bottle by rings *k* *l*, of cork or other elastic material suitable for the purpose; but it may be held in place by other means, and I do not limit myself to the particular method of holding said casing in place illustrated in the drawings.

The valve-plug *c* is not solid, but contains a conical recess *j*, which serves to lighten the valve-plug, to pocket air in case an attempt be made to fill the bottle while the latter is in an inverted position, so causing the valve-plug to float, and to receive the first drops of any liquid which may be poured into the mouth of the bottle while the latter is upright, thus increasing the weight of the valve-plug and increasing its tendency to remain seated.

To facilitate the assembling of the valve-casing, valve-plug, and weight, the hook or eye by which the weight is connected to a similar hook or eye on the valve-plug may be on the end of a rod *i*, which passes through a central passage in weight *h* and is provided at its lower end with a head by which the weight is secured on the rod, as shown in Fig. 1, or, if preferred, the hook or eye by which the weight is so secured to the plug-valve may be integral with the weight, as shown in Fig. 4.

The guard *d* consists of a central vertical portion *m*, having within it an opening *n* for the passage of fluid, and two laterally-projecting portions *o*, projecting in opposite directions from the portion *m* and from opposite ends thereof and each closing one side of the neck of the bottle, thereby preventing the direct passage through the neck of the bottle of any instrument by which the valve-plug *c* might be manipulated. In this guard *d* are key-slots *p*, oppositely inclined, so that whether the bottle be upright or inverted a key in one of the slots will engage a groove in the neck of the bottle. The said keys are balls *r*, formed of glass or similar suitable material. To insert the guard into the neck of the bottle and secure it in place, these balls *r* are first placed in their respective slots and

are held in place therein while the guard is being inserted into the mouth of the bottle and until the orifices of said key-slots are masked by the neck of the bottle. When the guard has been pressed down into the neck of the bottle until the orifices of the key-slots are opposite the groove *q* in the neck of the bottle, one of the balls *r* will fall out slightly, thus locking the guard in place, and if the bottle be inverted although that ball which first locked the guard in place may run back into its groove the other ball will roll partly out of its groove, so locking the guard in place. If preferred, the guard may have more than two key-slots, as illustrated in Fig. 5, in which a guard having four of such slots is shown. Preferably that portion of the guard *d* which forms the bottom of the passage *n* is provided with a recess *t*, the sides of which are curved, so that if a wire or similar instrument inserted into the neck of the bottle comes into contact with the curved sides of the recess it will be deflected upward and thus prevented from reaching the vicinity of the top of the valve-plug.

To increase the efficiency of the weight *h*, it may be provided with a rolling weight *s*, located in a channel *u* in the weight, as indicated in Fig. 4.

In applying my improved stopper to a bottle the valve-casing *b*, valve-plug *c*, and weight *h* are first assembled. If the weight be constructed, as shown in Fig. 1, this assembling may be accomplished conveniently by placing the valve-plug *c* within the casing *b* and against its seat, connecting the valve-plug and the rod *i* and then passing the rod *i* through the central passage of the weight *h* and heading said rod by heating its lower end and pressing it in the manner well known to glassworkers; but if the hook or eye by which the weight is to be secured to the valve-plug is to be integral therewith it may first be separated therefrom and may be welded thereto after being connected to the valve-plug, or the connection between the valve-plug and weight may be made in other ways well known to glassworkers. The lower cork ring *k* is then pressed downward into its proper place in the neck of the bottle. The valve-casing, with its attached parts, is inserted into the neck and allowed to drop down upon the ring *k*, and the upper ring *l* is inserted and pressed down so as to hold the casing *b* stationary. The guard *d* is then inserted and fastened in place in the manner already described. The stopper being in place within the bottle, if the bottle be inclined downward the valve-plug *c* will move from its seat, provided there be liquid in the bottle, and such liquid may then flow out through one of the openings *g* in the valve-casing and opening *n* in the guard *d*, air entering through said opening *n* and the other opening *g* in the valve-casing; but as soon as the liquid in the bottle is exhausted or as soon as the mouth of the bottle is elevated the valve will be closed by the weight

h, thereby preventing the entrance of liquid into the bottle.

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

1. In a bottle-stopper, the combination, with a valve-casing having a valve-seat and an open inner end against which a weight may pivot, of a conical valve-plug projecting into the casing from the outer end thereof and terminating near the inner end, and a weight, directly pivoted to the inner end of the valve-plug and having a shoulder which is in close proximity to the valve-casing when said casing is upright, and is arranged to make contact with the casing when the latter is slightly inclined, and then to swing about such point of contact as a fulcrum, thereby tending to draw the valve-plug to its seat, the point of connection of the valve-plug and weight being nearly opposite to the point about which such weight will pivot when the casing is inclined, whereby the direction of pull of the weight upon the valve-plug is substantially axial.
2. In a bottle-stopper, the combination, with a tubular valve-casing open at both ends, having a valve-seat and a flange by which it may be secured in the neck of a bottle, and having openings in its sides for the passage of liquid, of a conical valve-plug projecting into the casing from the outer end thereof and terminating near the inner end, and a weight, directly pivoted to the inner end of the valve-plug and having a shoulder which is in close proximity to the valve-casing when said casing is upright, and is arranged to make contact with the casing when the latter is slightly inclined, and then to swing about such point of contact as a fulcrum, thereby tending to draw the valve-plug to its seat, the point of connection of the valve-plug and weight being nearly opposite the point about which such weight will pivot when the casing is inclined, whereby the direction of pull of the weight upon the valve-plug is substantially axial.
3. In a bottle-stopper, the combination, with a device adapted to be inserted into the neck of a bottle, and having a plurality of key-slots, of keys adapted to fit within said slots and to engage a groove within the neck of a bottle, when the said device is in place therein, thereby preventing the removal of said de-

vice, one of the said key-slots being inclined upwardly from the groove and the other inclined downwardly therefrom, so that whether the bottle be upright or inverted, one of said slots is inclined downward relatively to the groove and its key tends to engage the groove in the neck of the bottle.

4. The combination, with a bottle having an internally-grooved neck, of a device adapted to be inserted into said neck and having a plurality of key-slots, and movable keys adapted to fit within said slots and to engage a groove in the neck, thereby preventing the removal of said device, one of the said key-slots being inclined upwardly from the groove and the other inclined downwardly therefrom, so that whether the bottle be upright or inverted one of said slots is inclined downward relatively to the groove and its key tends to engage the groove in the neck of the bottle.

5. A guard for bottles, consisting of a device adapted to be inserted into the neck of a bottle and to be secured in the neck thereof, and having two oppositely-projecting transverse portions each adapted to close one side of the neck of a bottle, said transverse portions being connected by a central portion in which is an aperture for the passage of liquid and in which are also key-slots adapted to contain keys which may engage a groove in the neck of the bottle, one of said key-slots being inclined upwardly from its orifice inward, and the other key-slot being inclined downwardly from its orifice inward.

6. A guard for bottles, consisting of a device adapted to be inserted into the neck of a bottle and to be secured in the neck thereof, and having two oppositely-projecting transverse portions, each adapted to close one side of the neck of a bottle, said transverse portions being connected by a central portion in which is an aperture for the passage of liquid, the bottom wall of such aperture being provided with an upwardly-inclined portion by which instruments inserted through said aperture may be deflected upwardly.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH W. CALEF.

Witnesses:

HARRY M. MARBLE,
SAML. W. ADAMS.