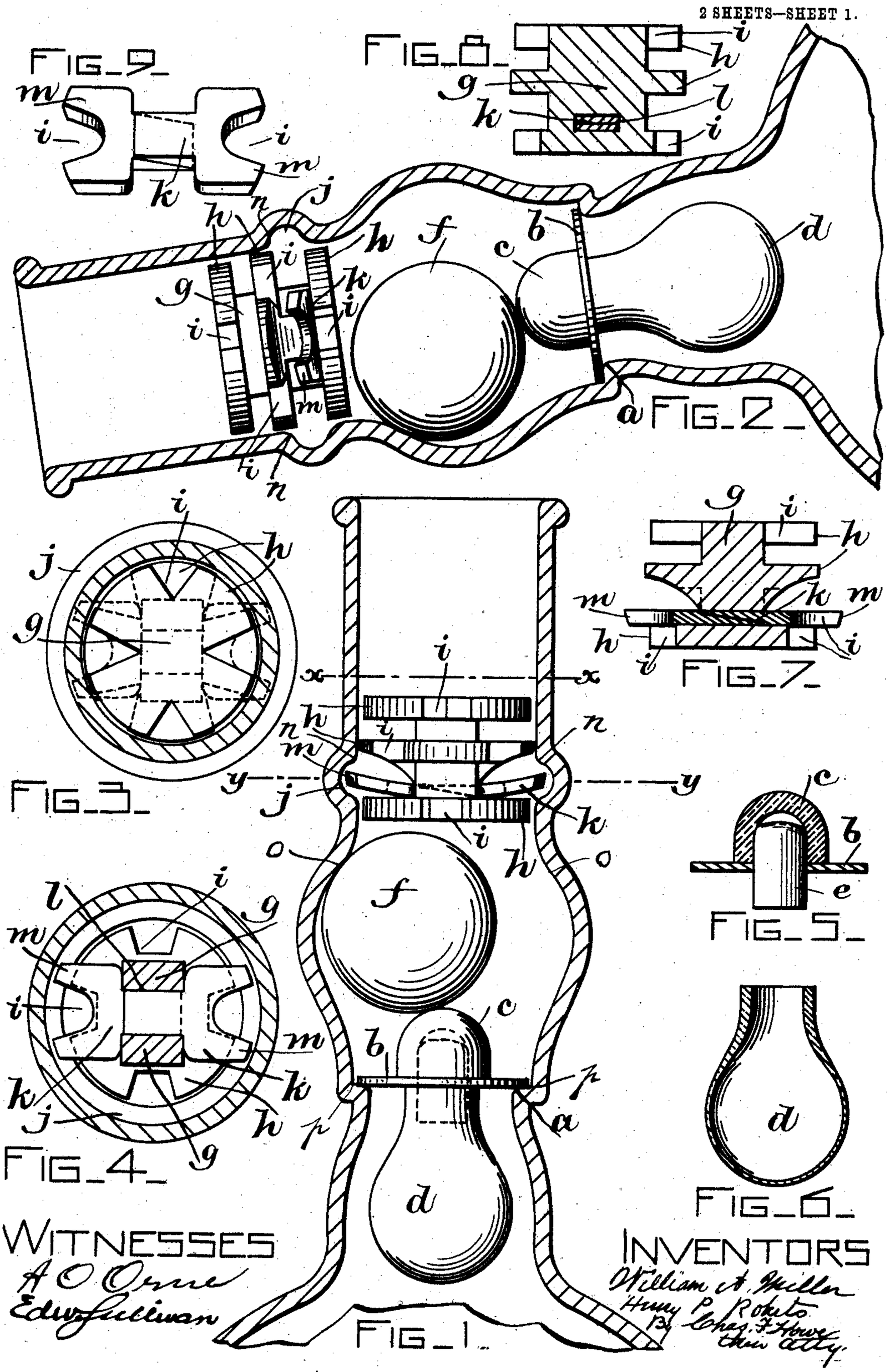
No. 864,248. PATENTED AUG. 27, 1907.

W. A. MILLER & H. P. ROBERTS.

SELF SEALING BOTTLE.

APPLICATION FILED JULY 25, 1906.

2 SHEETS—SHEET 1.



WITNESSES

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By Chas. F. Howe

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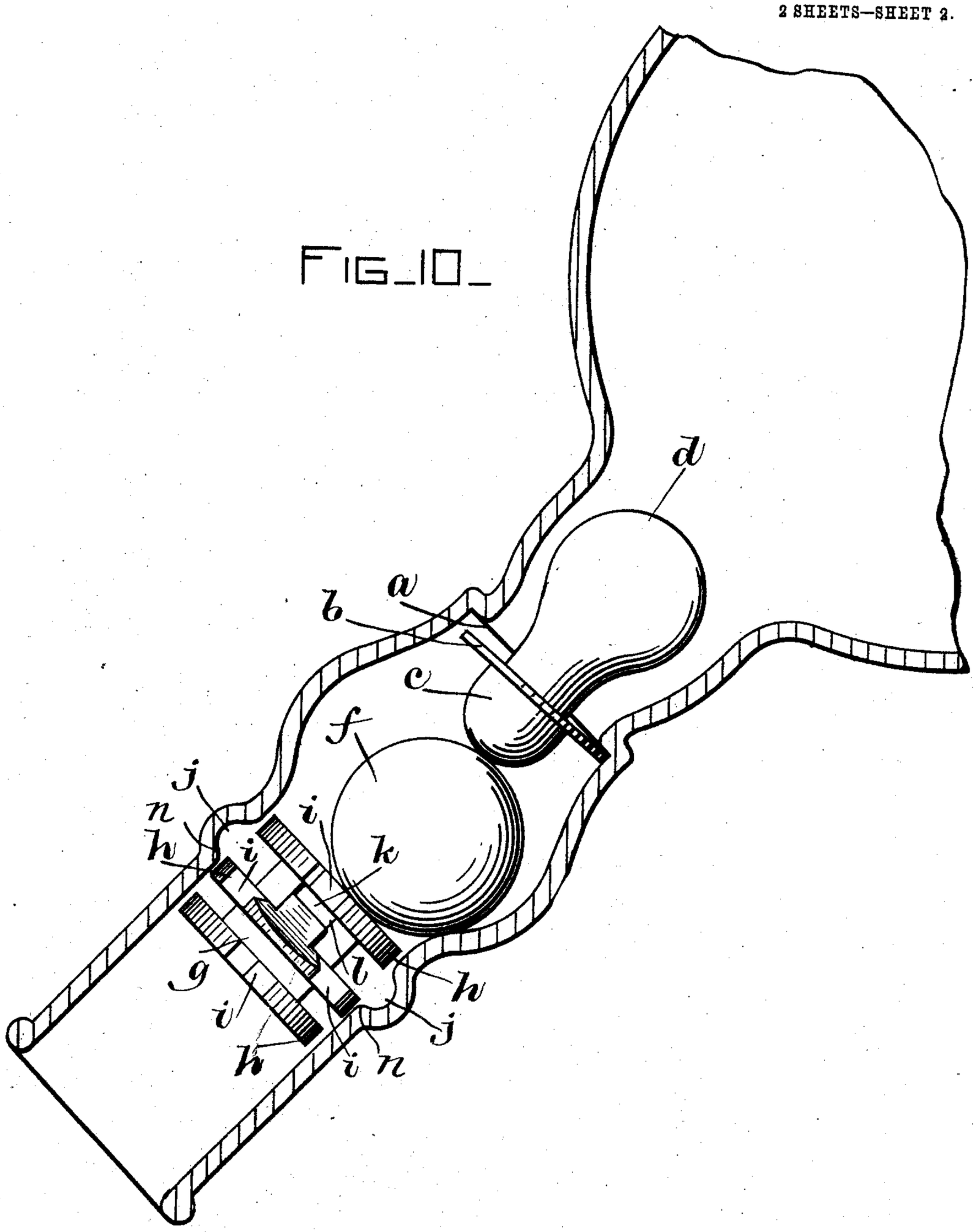
2 SHEETS—SHEET 2.

FIG. 10.



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UNITED STATES PATENT OFFICE.

WILLIAM A. MILLER AND HENRY P. ROBERTS, OF BOSTON, MASSACHUSETTS.

SELF-SEALING BOTTLE.

No. 864,248. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed July 25, 1906. Serial No. 327,611.

To all whom it may concern:

Be it known that we, WILLIAM A. MILLER and HENRY P. ROBERTS, both citizens of the United States, residing in Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Self-Sealing Bottles, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates to improvements in self sealing bottles in which a valve is located below a guard in the neck of the bottle.

The principal objects of the invention are to simplify and to improve the efficiency of the self sealing devices, to make them inexpensive, and to facilitate their adjustment in the bottle for use; and to thus produce a bottle of the above mentioned class at a slight cost above that of an ordinary bottle.

The invention consists in a bottle having a single valve and a single valve seat, devices for positioning the valve without confining its free movement in the valve chamber, devices for holding an edge of the valve to the valve seat, devices for rocking the valve on its seat, means to limit the vibration of the valve, a float within the bottle attached to the valve, a weight in the valve chamber acting to seat the valve, an arrangement of the valve touching the seat in one direction and touching a ball in the valve chamber in the other direction, so the valve may wabble edgewise on its seat permitting liquor to escape, but preventing its return to the bottle, and furthermore in certain details of construction and arrangements of parts to be pointed out.

The drawings show in: Figure 1, a longitudinal section through the bottle neck in a vertical position, showing the sealing devices. Fig. 2, a longitudinal section through the bottle neck revolved quarter way and near horizontal position, showing sealing devices. Fig. 3, a cross section at *x*—*x* of the bottle neck showing the guard. Fig. 4, a cross section at *y*—*y* of the bottle neck showing latch and associated parts of the guard. Fig. 5, a section of the valve. Fig. 6, a section of the float. Fig. 7, a section of the guard positioned as in Fig. 1. Fig. 8, a section of the guard at right angles to position as in Fig. 7. Fig. 9, a sketch showing the latch for the guard. Fig. 10, a longitudinal section of the bottle neck inclined to a pouring position.

Our bottle is made in the usual manner, and just above the junction of the neck with the bottle the seat *a* is formed in the neck of the bottle. The valve *b* of some light, thin substance, as hard rubber, covers this seat. This valve consists of a thin disk of said material, held between the glass knob *c* and the hollow glass bulb or float *d*, by means of the small cork neck *e* which passes through the disk and into the knob and bulb. The thin disk of the valve is nearly the size of the bottom of the enlarged valve chamber in the bottle neck just at the outer circumference of the valve seat *a*. This arrangement restricts the flow of fluid past the valve *b*, and thereby renders the valve sensitive to the movement of fluid past the widely spreading circumferential edges of the valve. The buoyancy of the bulb is sufficient to float the combined valve when immersed in liquid. The float *d* assists the valve to open when the bottle is held in a pouring position, because of the buoyancy of the float *d* which rocks the valve on the edge of its disk. This arrangement of the float *d* within the bottle and attached to the valve is of importance, as there may be a tendency of the valve to stick to its seat. But when the liquor does not lift the float *d* then the float acts as a weight rocking the valve on the edge of its disk in a direction tending to reseat the valve. This twofold function of the float within the bottle distinguishes this construction from those having a weight only attached to the valve within the bottle.

To insure holding the valve to its seat when the bottle is held with the neck above the position illustrated in Fig. 2, a heavy solid glass ball *f* is placed in the bottle neck beyond the valve, to rest in contact with the knob *c* of the valve.

The guard *g* consists of radiating wings *h* arranged in horizontal planes one above another, but spaced so the wings of every series will be in the vertical plane of the openings or passages *i* of other series of wings, so only irregular passages lead through the guard for the passage of liquid, thus protecting the valve *b* from any attempt to tamper therewith. This guard is secured in the bottle neck by forming a groove *j* in the bottle neck to receive the latches *k* which are made of some suitable slightly yielding substance, as for example wood.

The latches may be attached to the guard by passing their skived ends diametrically through a horizontal slot *l* in the guard, so the latches rest on the squared upper surfaces of the wings *h* of the lowest series of such wings, although we sometimes make the slots *l* of sufficient height to receive the parts of the latch without skiving the same.

The two opposite wings *h* of the series of wings immediately above the latches are beveled so the latches may take an inclined angle as the guard enters the bottle neck, and when the latches *k* snap into the groove *j*, the guard besides being thus supported in the bottle neck is secure against removal, because the ends *m* of the latches *k* project over the squared edges of the wings *h*, into contact with the groove *j* of the bottle neck, and as the space between the wings of the guard and the wall of the bottle neck is limited the latches would interfere with the edge *n* of the groove *j* in the bottle neck if the guard is pulled outward. Above the guard an ordinary stopper may close the bottle neck for shipping.

It will be noticed that the ball *f* is not only heavy but also large, occupying about all the axial distance

in the enlarged chamber of the bottle neck between the knob *c* and the inner surface of the guard *g*, that the ball *f* when resting between the knob *c* and the inclined portion *o* of the enlarged chamber of the bottle or resting on the guard *g* permits only very limited motion of the valve *b*, and that in all positions of the bottle in which the inclination is less than about 45 or 50 degrees from the horizontal, the valve is influenced by the ball *f* in a manner tending to reseat the valve. It is also to be noticed that the valve in moving generally swings pivotally in the crease *p* of the chamber at the circumference of the valve seat *a*, that the knob *c* always touches the ball *f* and the valve usually touches some part of the valve seat if the valve is open.

Although it is possible for the valve to entirely leave the valve seat, any such position is very unstable and immediately gives place to a position for the valve in which some part of its edge touches the crease *p* or some part of the valve seat *a*. It is furthermore to be noted that the curved surfaces of the ball *f* and of the knob *c* determine one touching point for the valve *b* when open, and the other touching point or short line at most is at the edge of the valve disk usually somewhere in the crease *p* of the enlarged chamber of the bottle neck just at the extreme circumference of the valve seat *a*, so the valve is at all times unrestrained, and free to move in any direction within the limits provided, and hence is distinguished from constructions in which the valve is restricted by the guideways and otherwise to certain directions of motion.

The bottle is first filled with liquid, then the valve is dropped to its seat, the glass ball inserted and finally the guard is pushed into place in the bottle neck. The liquid may be poured from the bottle when inclined as in Fig. 10, without spattering, as the passages *j* in the guard together with the large valve *b* provide for free entrance of air as the liquid leaves the bottle. If an attempt is made to refill the bottle when upright the ball *f* will hold the valve to its seat. If the bottle is inverted the floating valve *b* will be carried upward by entering liquid and force the valve *b* to its seat. If the bottle is held in positions near horizontal in a tank, the glass ball *f* positions the valve in contact with the seat *a*, and entering liquid will aid in holding the valve to its seat, while if the neck of the bottle dips considerably below the horizontal the float *d* will rise in the liquid within the bottle and lift the valve to its seat *a*, although the ball *f* at such times rests on the bottom of the guard. Shaking the bottle while submerged in liquid fails to fill the bottle as in all cases either the ball or the float will reseat the valve at once, as the motion of the valve is purposely limited to render it responsive to entering liquid.

Having described our invention, we claim and desire to secure by Letters Patent of the United States:

1. In a self sealing bottle, the bottle neck, a valve chamber therein, a valve seat in the bottle neck, a disk valve opening outward on the seat, a float attached to the valve and positioned beyond the seat of the valve chamber, a knob attached to the valve disk and positioned in the valve chamber, a ball weight in contact with the knob, a guard limiting motion of the ball axially from the valve seat, the walls of the valve chamber limiting motion of the ball weight beyond the axis of the valve chamber, and the parts proportioned to limit motion of the valve when open to positions responsive to entering liquor to close the valve, substantially as described.

2. In a self sealing bottle, the bottle neck, a guard and a valve seat therein, combined with a valve, means to keep the valve in wabbling contact with its seat as liquor escapes from the bottle, and positioned within the influence of moving fluid at the edge of the valve to close the valve as liquor enters the bottle, substantially as described.

3. In a self sealing bottle, the bottle neck, a guard fast in the said neck, a valve chamber and a valve seat in the bottle neck, combined with a disk valve, a float for the disk valve, a ball weight in the valve chamber touching the guard in pouring positions of the bottle, the bottle neck having a shoulder for limiting radial movement of the ball from the axis of the bottle neck, also having a crease adjacent to the valve seat for supporting the valve with part of its edge in contact with the valve seat, and means on the valve touching the ball to position the valve and limit motion of the valve edge to distances from its seat at places where not supported in contact therewith within which the valve will close to an entering fluid, substantially as described.

4. In a self sealing bottle, the bottle neck, a valve seat in the bottle neck, a guard fast in the bottle neck, a floating valve on the valve seat having a wide thin flange, a ball weight between the guard and valve of diameter substantially equal to the axial distance from guard to valve, the motion of the ball being limited radially from the axis of the bottle neck by portions of the said bottle neck to distances allowing the valve restricted edgewise rotary rocking motion from its seat to permit escape of liquid, while maintaining a portion of the valve edge in contact with said seat, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WM. A. MILLER.
HENRY P. ROBERTS.

Witnesses:
GEORGE W. JACKSON,
CHAS. F. HOWE.