(No Model.) 2 Sheets—Sheet 1.

# D. BLUM.

## SAFETY CLOSURE FOR BOTTLES.

No. 589,926. Patented Sept. 14, 1897.

FIG. 1.

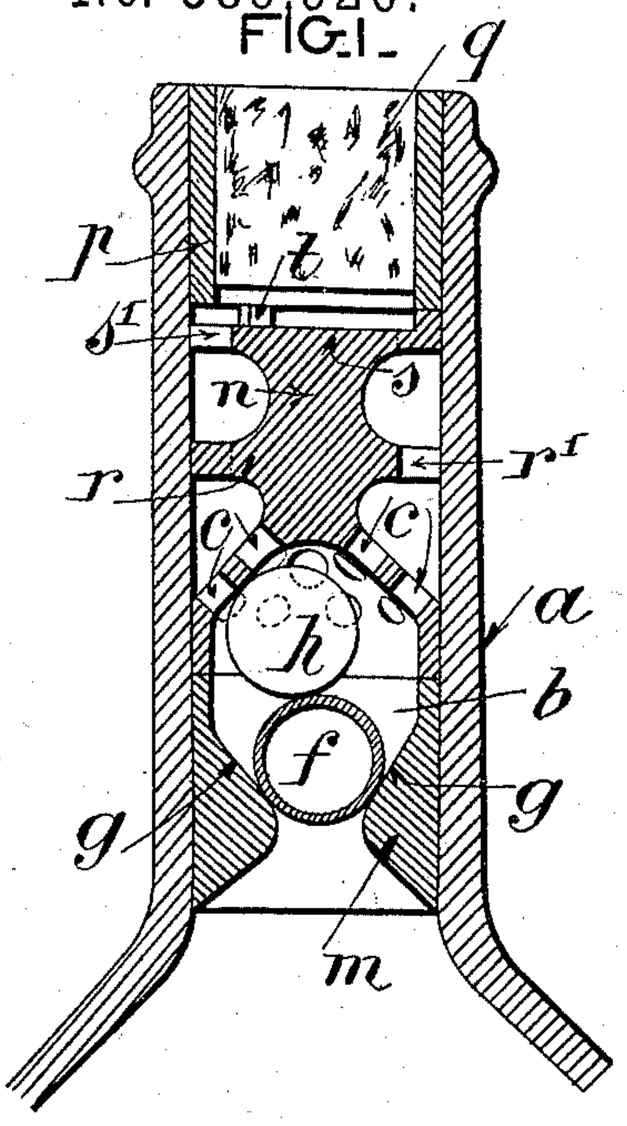



FIG. 2.

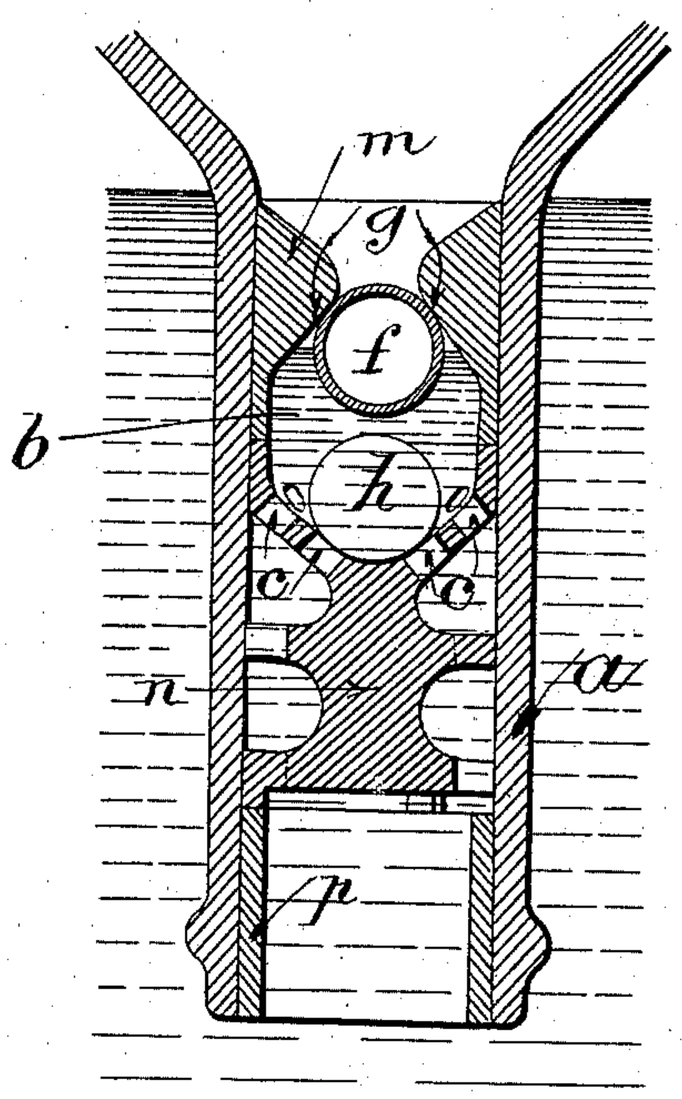



FIG. 4.

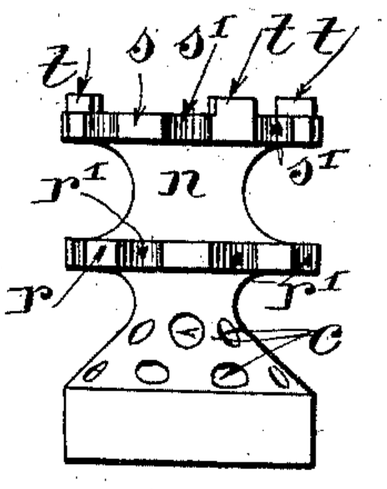



FIG 4a

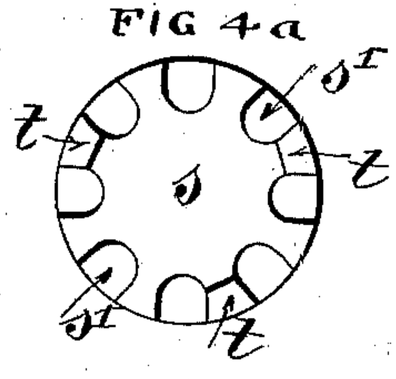



FIG. 3.

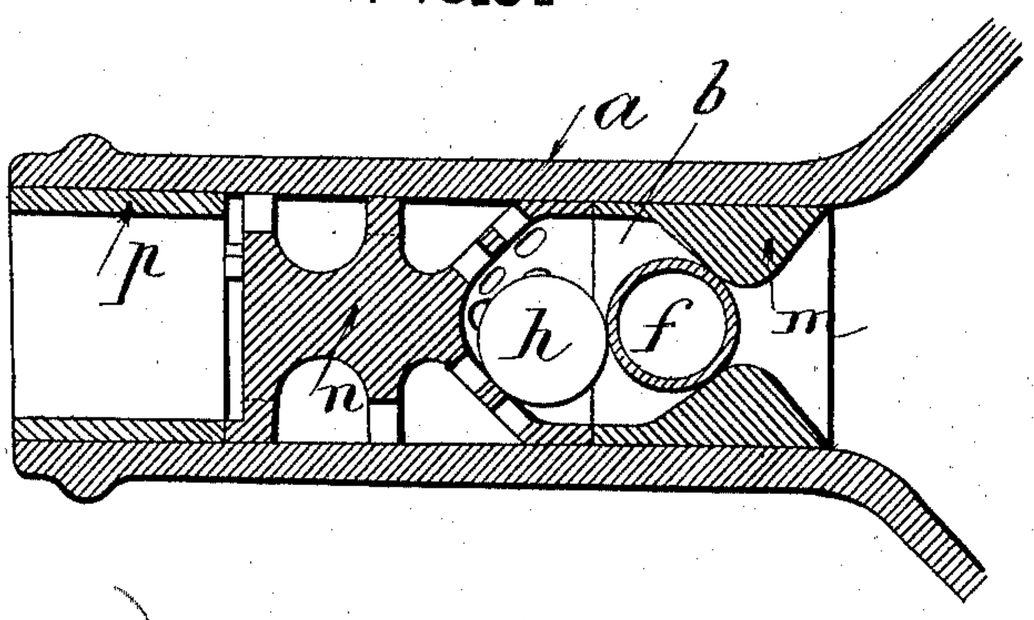
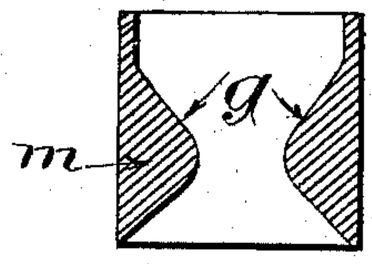



FIG. 5.



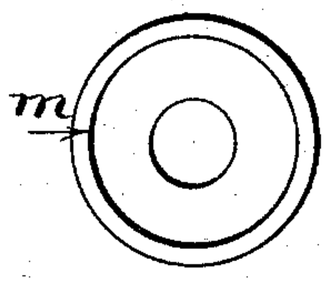




FIG 5a

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(No Model.) 2 Sheets—Sheet 2.

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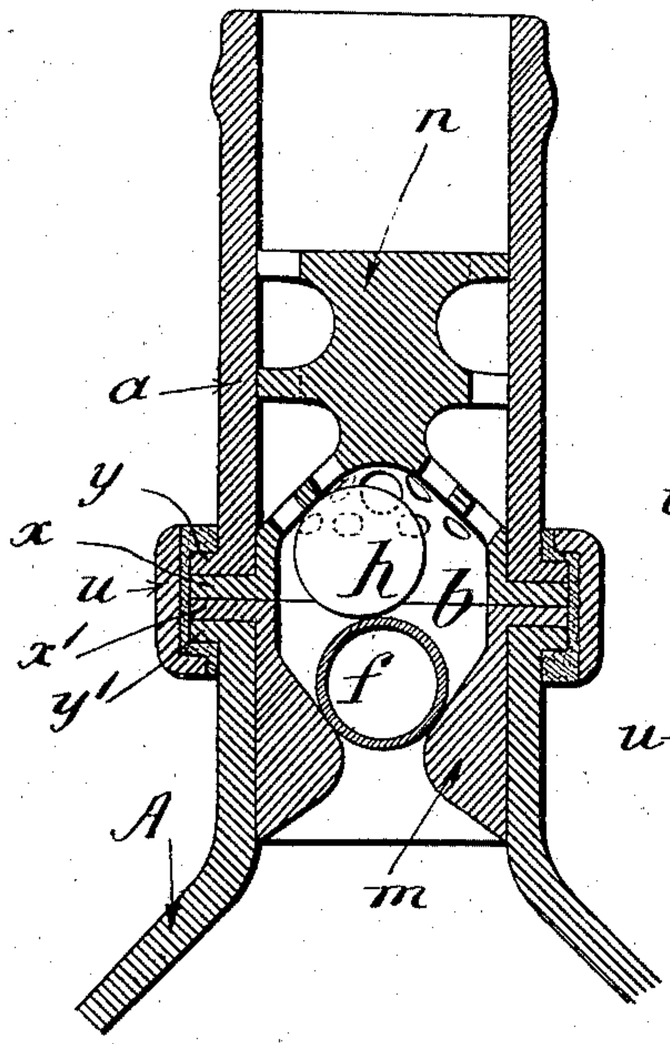
## SAFETY CLOSURE FOR BOTTLES.

No. 589,926. Patented Sept. 14, 1897.

FIG. 6.



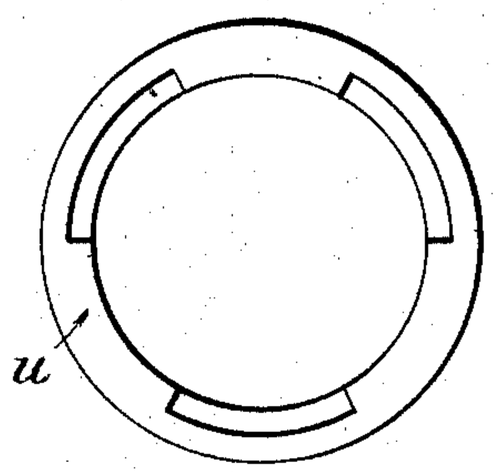




FIG 6a

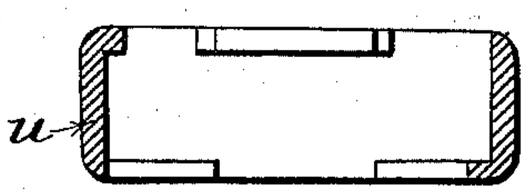
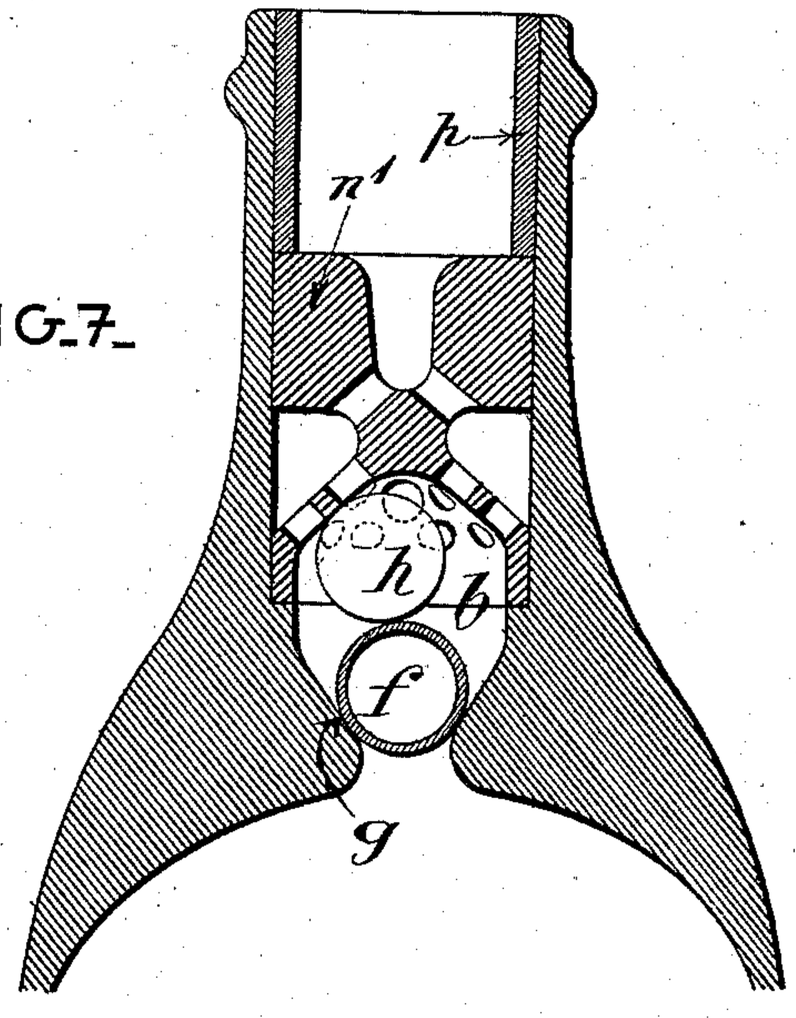



FIG 6b

FIG. 7.




Witnesses
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A. E. Melchioh

Inventor
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by his Attorney P. Haddaway

# UNITED STATES PATENT OFFICE.

DAVID BLUM, OF PARIS, FRANCE.

## SAFETY-CLOSURE FOR BOTTLES.

SPECIFICATION forming part of Letters Patent No. 589,926, dated September 14, 1897.

Application filed January 8, 1897. Serial No. 618,467. (No model.) Patented in France November 18, 1896, No. 248,934.

*To all whom it may concern.*

Be it known that I, DAVID BLUM, a citizen of the French Republic, residing at Paris, France, have invented certain new and useful Improvements Relating to Safety-Closures for Bottles and other Receptacles, (for which I have received a French patent, dated November 18, 1896, No. 248,934,) of which the following is a specification.

My invention relates to a bottle or other receptacle for liquids, which can be emptied at pleasure and into which it is impossible to again introduce by any means a liquid after the bottle has been once closed. Such a receptacle is intended to suppress frauds of this nature with regard to liquors, spirits, &c.

The characteristic safety arrangement of my invention comprises, essentially, two spherical balls, the one being heavy and the other light and buoyant, which can be both displaced without, however, changing their relative positions in a chamber formed by two conical surfaces opposed to one another at their bases, which chamber is constituted by an appropriate construction in the neck of the bottle or of the outlet-tube of the receptacle and communicates on one side with the interior of the receptacle and on the other side with the exterior. The light ball forms a spherical valve and is constantly kept on its seat when one tries by any means to introduce liquid fraudently into the receiver and whatever be the inclination or position of this receiver. The simple combination of the two balls—the one heavy and the other light—secures the closing when the bottle is vertical, straight, or overturned, or in positions nearly vertical, and the combination of the two balls and of the chamber with double conical surface secures the closing for the horizontal and inclined positions. The emptying of the bottle is effected quite naturally, the light ball leaving its seat under the pressure of the interior liquid.

In the annexed drawings is shown the application of my safety arrangement to an ordinary bottle.

Figure 1 is an elevational cross-section of the bottle, showing the position of the parts when this bottle is in the natural vertical position. Fig. 2 is a corresponding view showing the position of the arrangement if one tries to fill the bottle by immersing it in a liquid mouth downward. Fig. 3 is an analogous view showing the position of the parts when the bottle is placed horizontally. Fig. 4 is a detail view of the protective part allowing the outflow of the liquid while preventing access to the safety device. Fig. $4^a$ is a plan thereof. Fig. 5 shows the seat of the closing-ball. Fig. $5^a$ is a plan thereof. Figs. 6 and 7 are variations of the construction of the neck of the bottle provided with this safety arrangement. Figs. $6^a$ and $6^b$ are details of part of Fig. 6.

I arrange in the bottle-neck *a* by an appropriate construction a chamber *b*, formed by the opposition of two conical spaces, the one having its apex diverted toward the body of the bottle and the other toward the neck. The conical hollow turned toward the body of the bottle is perfectly regular and communicates at its lowest part with the interior of the bottle. The upper conical hollow communicates by holes *c* with the exterior.

In the chamber *b* are placed two spherical balls, the one *f* light and bouyant, which forms a perfect joint when resting upon the under conical surface or seat *g*, and the other a heavy ball *h*, which rolls upon the upper conical surface and rests when the bottle is standing upright upon the light ball.

The two balls *f* and *h* have approximately the same diameter and there is an interval of several millimeters between them when they are in their extreme positions in the chamber *b*, but they have such diameters that they cannot exchange places in the said chamber. The light ball is hollow and may be made of glass, celluloid, or aluminium, or may be solid and made of compressed cork or other buoyant substance, and the heavy ball *h* is solid and made of glass, marble, metal, &c. I preferably construct the two balls of glass, the one hollow and the other solid. With such an arrangement fixed in the neck of the bottle it is impossible to introduce any liquid into this bottle.

If the bottle is standing upright, the heavy ball rests by its weight upon the light ball and presses the latter upon its seat. Therefore an introduction of liquid is impossible, Fig. 1.

If the bottle is turned with its mouth ver-

tically downward, Fig. 2, and one introduces into the neck from below upward a liquid under pressure, the latter rises in the chamber *b*, and with it the floating-ball *f*, which rests upon its seat and prevents this liquid entering the bottle.

If the bottle is horizontal or inclined and if in such a position one introduces into the neck a liquid under pressure, the latter cannot enter into the interior of the bottle, since the heavy ball *h*, being then upon an inclined plane, presses by its weight the light ball *f* upon its seat.

In order to construct the chamber *b* in the neck of the bottle, one can use various constructions. The arrangement shown in Figs. 1, 2, and 3 is one of the simplest.

The neck of the bottle *a* is in one piece, as in ordinary bottles, and it is very slightly flared outward throughout its length. The inner part of the neck is interiorly polished up to a certain height, and into this neck first is placed a conical piece *m*, polished exteriorly. It forms a perfect closure on its circumference. The bottle is then filled with liquid. The two balls *f* and *h* are placed in the conical cavity of the piece *m*, superposing them, as aforesaid, and upon these balls is placed the safety-piece *n*, which is introduced without friction into the neck. Finally, in order to fix the whole in place and to prevent it from being taken out a ring *p* is placed in the neck, which reaches the mouth of the neck. The upper edge of the bottle is presented to the flame of the blow-pipe, which unites sufficiently the edges of the neck *a* and of the ring *p*. A cork stopper *q* is placed in this ring *p*, and the bottle is ready for transport. One can empty it, but it is impossible to again introduce any liquid into it.

The safety-piece *n*, which helps to constitute the chamber *b* and allows the leaving of the liquid through the holes *c*, serves also to prevent access from the outside to tamper with the balls with a metal wire or any other means. For this purpose it has two or more crowns *r* and *s* grooved in their circumference, the recesses *r'* of one crown being out of coincidence with those *s'* of the other. In order that the ring *p*, which projects in the interior, does not close the recesses *s'* of the upper crown and does not prevent the outflow of the liquids, three or four bosses or projections *t* are made upon the upper face of this crown *s*, Fig. 4.

In Fig. 6 is shown a variation of the construction. I constitute also the chamber *b* of separated molded pieces *m* and *n*, assembled and retained with the body of the bottle A and the neck *a* by means of part flanges *x x'* *y y'*, embraced by a sleeve *u* to be filled with a cement or silicate of potash or any other appropriate means, which is allowed to dry in the sleeve *u*, around the part flanges of the different assembled parts. The sleeve *u* is grooved and recessed, as shown in Fig. 6, and the part flanges of the assembled pieces are so made that by turning the sleeve *u* its part flanges engage over the part flanges *x x' y y'*, thus giving when fixed by the setting of the cement a secure fastening. Finally, in Fig. 7 the seat *g* of the valve is formed by the body itself of the receptacle. In the neck is placed a piece *n'*, which can be disposed as in the drawings and which is fixed in its position by placing in the neck the ring *p*, which is united at its upper part with the border of the neck, as described before. This disposition, consisting of forming the seat of the valve with the body of the receptacle, will be especially applicable for metallic receptacles and the like.

I claim as my invention—

A safety-bottle having a neck *a* slightly flared and polished in the interior in combination with block *m* polished exteriorly and forming a closure by reposing upon the polished part of the neck, said block having a conical cavity forming a valve-seat *g*, and a block *n* placed freely in the neck over the piece *m*, having in its base a conical cavity, and a buoyant ball *f* and a heavy ball *h* in said cavities, a glass ring *p* placed in the neck over the block *n* and united at its upper extremity with the border of the neck.

In witness whereof I have hereunto set my hand in presence of two witnesses.

DAVID BLUM.

Witnesses:
GEORGES DREYFUS,
EDWARD P. MACLEAN.