

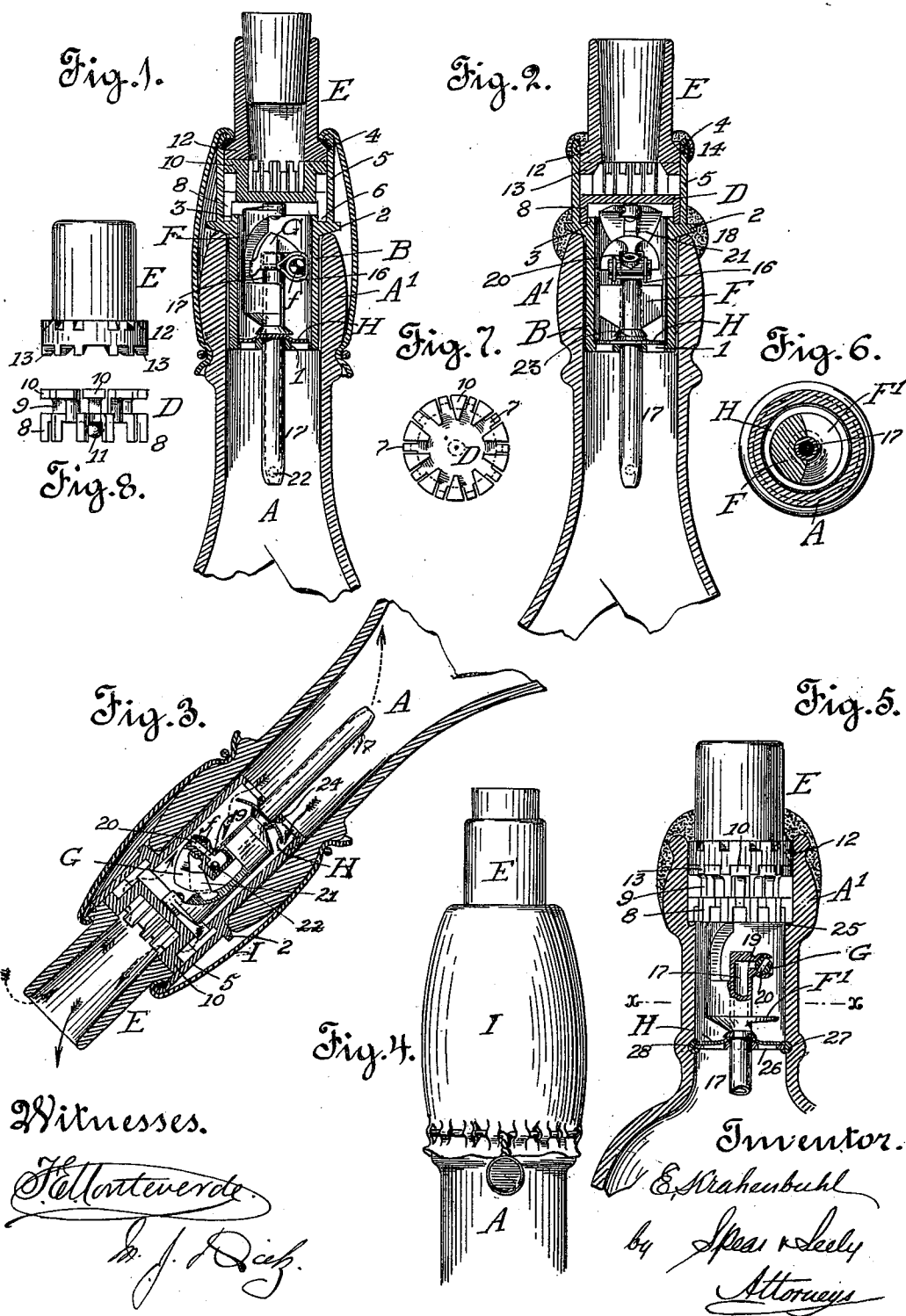
No. 666,932.

Patented Jan. 29, 1901.

E. KRAHENBUHL.
UNREFILLABLE BOTTLE.

(Application filed Mar. 5, 1897.)

(No Model.)



UNITED STATES PATENT OFFICE.

ERNEST KRAHENBUHL, OF SAN RAFAEL, CALIFORNIA.

UNREFILLABLE BOTTLE.

SPECIFICATION forming part of Letters Patent No. 666,932, dated January 29, 1901.

Application filed March 5, 1897. Serial No. 626,032. (No model.)

To all whom it may concern:

Be it known that I, ERNEST KRAHENBUHL, a citizen of Switzerland, (but having declared my intention of becoming a citizen of the United States,) residing at San Rafael, in the county of Marin and State of California, have invented certain new and useful Improvements in Unrefillable Bottles; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to devices for rendering bottles unrefillable after they have been partly or wholly emptied of their original contents.

One object of my invention is to provide a cheap and simple mechanical contrivance for preventing refilling which can be applied to a bottle without any change in its interior or exterior structure and which therefore does away with the necessity of making a special bottle to receive and retain the preventive mechanism.

A further object of my invention is to automatically exclude air from the bottle except at such times as the liquid is being poured out, at which times air is admitted to the interior.

My invention can also be applied to specially-constructed bottles where such are desirable, as is sometimes the case, and I have therefore described it in connection with different kinds of bottles and have so illustrated it in the accompanying drawings, in which—

Figure 1 is a vertical section of the neck of the bottle. Fig. 2 is a similar section taken at right angles to Fig. 1. Fig. 3 is a section similar to Fig. 1 in the position of pouring liquid from the bottle. Fig. 4 is an elevation of the same bottle-neck with an exterior sheath and seal. Fig. 5 is a modification showing my invention as applied to a bottle of special construction. Fig. 6 is a cross-section on line *xx* of Fig. 5. Fig. 7 is a plan view of the toothed guard through which the liquid flows out, but which prevents the insertion of a wire into the bottle. Fig. 8 is a detail elevation of the two members constituting the guard which prevents access to the automatic valve, preventing refilling.

A represents the neck of a bottle of a well-known kind, having the enlarged or thickened bead *A'* at the top. The inside of the

neck is smooth and unbroken. Within the neck after the bottle is filled is placed the separate preventive and corking device, which may, however, be assembled together in and after the bottle is filled. This device consists of a chamber *B*, having a perforated or grated bottom 1 and provided with a flange 2, which rests upon the upper edge of the bottle-neck, and with another flange 3. From the flange 2 rises upwardly a rim 5, forming an exterior cup or receptacle and having a circular groove 4 near its upper edge. The flanges 2 and 3 and the rim 5 form a shallow circular groove 6. The chamber *B* and rim 5 and their flanges are preferably formed in one piece. It is to be remarked, however, that if it be considered objectionable for any reason to have the rim 5 projecting so far above the bottle-neck as illustrated the flange 2 may be formed at the upper edge of rim 5 or at any point between its base and upper edge, in which case part or all of such rim would be inserted into the bottle-neck, but occupying the same position relatively to the chamber *B*. This chamber, with its rim 5 and flanges, may be of any suitable non-corrodible material, as glass, porcelain, hard rubber, enameled metal, or aluminium, and may be secured within the neck in any suitable way, as by interior cementing or by exterior sealing. It is not, however, necessary to so secure it, as will be hereinafter explained.

Set within the cup or rim 5 is a circular plate *D*, Fig. 7. This plate is provided with radial arms 7, turned downward at right angles to form legs 8, separated from each other. These legs rest in the groove 6, and hence elevate the plate somewhat above the bottom of the cup 5. This groove 6 serves also as a check and preventive to the introduction of wires, &c. The air in penetrating into and the liquid in escaping from the bottle pass between these legs. On the upper face of plate *D* is a series of vertical projections 9, bent at right angles to form radial triangular teeth 10, which register with the spaces between the legs 8. The plate *D* is also provided with a downwardly-projecting pin or stud 11.

E is a hollow thimble having a widened base 12 and provided in its lower surface

with radial teeth 13. These teeth interlock with the teeth 10, as shown in Fig. 5 and as indicated in Fig. 8, where the plate and thimble are shown separately. The base-flange 12 of the thimble has its upper edge notched by grooves reaching below the edge of cup 5, so that suitable securing means, such as cement, may be introduced in these grooves in connection with circular groove 4 to secure the complete contrivance as a separate and complete device, thereby avoiding the necessity of building up or mounting the different pieces of the device at the time of bottling the contents. The hollow thimble now projects above the neck of the bottle, and its interior is preferably slightly tapered to receive an ordinary cork.

When the complete device or assembled parts are in place in the bottle-neck, they may be secured and protected there by an external sheath I, of suitable material, such as sheet metal or metal foil, so shaped as to wholly or partly encircle the neck of the bottle and capable of being contracted thereon. This sheath is open at the top, leaving at all times a free passage with access to the cork and pouring-outlet, and near its lower end means are formed for retaining it in place, such as the loops shown, into which is inserted a binding wire or pin drawn tight and secure. The upper edge of the sheath is shaped so as to rest upon the thimble E, and a seal or similar safeguard is affixed to the free ends of the binding wire or pin, as shown. This construction allows the same bottle-sheath, pin, and preventive device to be repeatedly used. The seal and sheath may bear trade-marks, warnings concerning unlawful use, removal, mutilation, &c., and insure the preservation of the original contents of the bottle. This is evident, because access to the interior can only be had by mutilating one or more of these parts or the exposed portion of the preventive device. I am aware that caps and capsules for bottles have already been devised and used; but so far as I am aware they are so constructed as to require removal wholly or partly by mutilation, and hence they are not adapted to bear a definite relation to an antirefilling device. It will be observed that in my device the pouring-outlet is entirely free when uncorked and that this sheath is not used in connection with the cork, and hence if mutilated must be so treated for some improper purpose. With my external sheath formed in one piece the sheath is put on readily and removed likewise when the seal is broken. The buyer of the bottle and each of his subsequent customers to whom the contents may be retailed can thus ascertain at a glance if the device has been tampered with. The manufacturer or bottler can take back his own bottles and can readily remove and reuse every part of it, including the sheath, and after refilling the old bottles can sell them again in a condition which guarantees the genuineness of

the contents. Of course the sheath in no way prevents the withdrawal of the cork. Instead of using the sheath, however, I may use external cementing or sealing material at the joint between the chamber and the bottle, as shown at 18, and at the joint between the thimble and the rim 5, as shown at 14 in Fig. 2. The thimble and toothed plate form an absolute guard against the insertion of a wire and yet allow a free flow of liquid, as indicated in Fig. 3.

A serious objection to this class of devices has hitherto been that the free flow of liquid from the bottles has been checked and prevented by the antirefilling devices, the liquid in many cases only trickling from the bottle. This is frequently caused by the shutting off of air from entering into the interior, the narrow neck being nearly filled with mechanism and with the escaping liquid. In connection with my preventive devices I have designed an automatically-acting air-valve normally closed, but opened by the act of inclining the bottle in order to pour out liquid, so that a free inlet for air is provided while the liquid is flowing.

Upon the pin or stud 11 is swiveled a weight F, the lower end of which has a pivot 15, which enters a central hole in the perforated bottom of the chamber 2. The body of this weight being all upon one side of a line drawn through its bearings will always fall toward the lower side of the bottle-neck in the act of pouring out liquid, Fig. 3. The central pin or pivot 15 of this weight is a tube with a closed top and open lower end, the latter projecting below the perforated bottom 1. At one side of the upper end of this tube is formed a half-bearing *f*, communicating by a passage 19 with the interior of the tube 17. Journalled in this bearing is a weighted valve G, the journal of which has a small transverse port 20. A small rubber band 16 may be used to hold the journals of the valve in position, Figs. 1 and 2. In its normal position the weighted part 21 of the valve fits within a recess formed in the weight F, as shown in Fig. 1, with the port 20 out of line with the passage 19, as shown in Fig. 5. In the act of pouring out liquid the valve swings toward the mouth of the bottle, causing the port 20 and passage 19 to register, Fig. 3. The tube 17 is preferably extended down into the bottle and provided with a small ball or float 22, of some light material. This floater prevents liquid from being pumped or forced through the air-valve, because it will rise with such liquid and close the lower or inner end of the tube 17, which end is somewhat contracted. In the position of Fig. 3 the liquid can flow freely from the bottle, as shown by arrows, while the air can also enter freely, passing through the air-valve and tube 17 into the interior. For an antirefilling-valve I prefer to use a flat and flexible disk of rubber H, mounted upon the tube 17 just above the perforated bottom 1, which will open to pressure of liq-

uid from the bottle, but will close against said bottom to pressure of liquid through the neck. At the junction of the valve-shoulder (which is preferably slightly inclined or hollowed inwardly) with the exterior of tube 17 a slight recess or groove 23 is formed in the tube of about the same thickness as the disk-rubber H, so as to keep the disk H from coming out of place. This shoulder also prevents the shifting or reversal of the valve by extra pressure from the interior, its central aperture being somewhat smaller and within its corresponding bearing, and thereby a local distention is produced toward the central part of the valve, causing the part so affected to assume locally a sunken or inverted conical shape, facing the opposite direction of the shoulder, and causing the unaffected part of the valve to project above the level of its seat and toward the perforated plate 1, against which it closes entirely and automatically, thus rendering the interior in a condition equivalent to that of a corked bottle and offering the minimum of resistance to be overcome by the escaping contents. This flexible valve being inaccessible is in no danger of being punctured and, moreover, may have additional protection from a shield F', projecting from the weight F, Figs. 5 and 6.

The devices thus far described are applied to an ordinary bottle of a well-known kind and, as will have been, seen require no change in the structure or shape of the bottle to adapt it to receive them. In order to illustrate my invention in connection with a specially-made bottle, I have shown in Fig. 5 a modified structure. The bottle-neck is in this case provided with a slightly-enlarged chamber near its mouth, producing a shoulder 25, upon which rest the projecting legs of the plate D. Hence it is unnecessary to use the interior chamber B, with its upwardly-extended rim, since the enlargement of the neck answers all the purposes of such chamber and rim. The perforated bottom is here a separate plate 26, preferably fitted with a rubber rim 27, which holds itself in a groove 28, formed in the bottle-neck, or a perforated plate fitted with a suitable elastic rim around its edge may be forcibly introduced and located within the neck of an ordinary bottle and there remain in proper position. The weight F, air-valve, preventive valve, and interlocking guard-plate and thimble are, however, constructed and used in the same manner as those previously described.

In the case of bottles provided with a beak or lip for pouring constantly from one side the weight F may be dispensed with, since its purpose is only to insure the operation of the air-valve in ordinary bottles, in which the liquid is poured out at any part of the outlet.

Instead of securing the flexible valve upon the tube 17 it may be sprung over a stud or projection formed upon the perforated bottom plate, such stud or projection being shaped so as to give the cup shape to the

valve, as before described. The stud or projection has an aperture extending through the plate when used in conjunction with the weight F, but may be solid when the weight is dispensed with, the contents of the bottle being then shaken out of the bottle in case of thick sauces.

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

1. In combination with a bottle having an antirefilling-valve, a swiveled and weighted air-inlet valve normally closed but adapted to open automatically to admit air when liquid is being discharged, and a guard for both of said valves, substantially as described.

2. In combination with a bottle having an antirefilling device, a guard near the mouth of the bottle, a perforated plate held within the bottle-neck, a weight pivoted to said guard and plate, an air-passage through one of its pivots, and a swinging air-valve journaled in said weight and adapted to open and close said air-passage automatically, substantially as described.

3. In combination with a bottle having an antirefilling-valve, a liquid-proof swiveled air-valve distinct from said antirefilling-valve, a guard for said air and antirefilling valves, composed of a toothed plate, and having a stud or bearing formed at its under side for a pivoted weight and a thimble forming the liquid-exit, such plate and thimble being secured to the bottle, substantially as described.

4. In a bottle provided with an antirefilling-valve, and having a chamber in its neck provided with a supporting-shoulder, a guard for said valve consisting of a plate having downwardly-projecting supporting-legs, which rest upon said shoulder, and also having upwardly-projecting teeth, and a thimble having interlocking teeth and provided with a liquid-discharge passage, and adapted to receive a cork, substantially as described.

5. In a bottle having an antirefilling-valve, a guard for such valve consisting of a solid plate having downwardly-projecting separate legs, and upwardly-projecting radial teeth, and a hollow thimble having teeth adapted to interlock therewith, and having a discharge-passage adapted to receive a cork, substantially as described.

6. In combination with a bottle having an antirefilling-valve, a swiveled and weighted air-inlet valve normally closed but adapted to open automatically to admit air when liquid is being discharged, an air passage or tube connecting said air-valve with the interior of the bottle, a float contained within said air-passage to prevent the forcible introduction of liquid when the air-valve is open, and a guard for both of said valves.

7. In combination with a bottle having a concealed guard near its mouth, a perforated plate held within the bottle-neck, a weight loosely pivoted to said guard and plate and having an air-inlet passage, and an antirefill-

ing-valve mounted upon said weight and adapted to close automatically against said perforated plate.

8. In combination with a bottle, a perforated plate within the bottle-neck through which liquid can flow from the bottle into the neck, an adjacent and coinciding flexible valve having free edges, said valve having its center supported and entered by a permanently-concentric part provided with a shoulder or recess, so conformed as to cause the immediately surrounding parts only of the valve to expand locally, and to protrude in a sunken or cup-like manner toward and above the perforated plate, whereby said valve closes automatically against said plate, a sight-exposed outer guard within the pouring-outlet, an intermediate and concealed inner guard located in the bottle-neck above the said valve and intervening between the external pouring-outlet and the said valve for preventing access to such valve.

9. As an article of manufacture and in combination an independent, removable and interchangeable antirefilling attachment for bottles and means for protecting and fastening the same to said bottles, said antirefilling attachment being complete in itself and its working parts contained within a chamber and therein protected by a double guard, consisting of two interlocking members, viz., a sight-exposed and a concealed guard, the

former being provided with a pouring-outlet adapted to receive a cork, while the chamber itself is adapted to close the mouth of the bottle, external means for protecting and fastening said attachment or device to the bottle securely, and yet in a removable manner, and consisting of a sheath, having an upper aperture for the pouring-outlet, and retaining means or loop-holes at its lower extremities, a suitable band or wire to engage said retaining means, and locking means to secure the ends of said wire together.

10. An antirefilling attachment for bottles, comprising a chamber having a flange adapted to rest upon the edge of the bottle-mouth; a combined guard and outlet within and projecting from said chamber; a perforated bottom to the chamber forming a valve-seat; a weight pivoted in said valve-seat and having an air-tube and air-valve; and a flexible disk on said tube adapted to close automatically against said bottom, and to open automatically to liquid-pressure from the interior of the bottle, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 16th day of February, 1897.

E. KRAHENBUHL.

Witnesses:

S. W. SEELY,
M. J. DIETZ.