No. 676,715. Patented June 18, 1901.

F. FRANZ.

NON-REFILLABLE BOTTLE.

(Application filed Oct. 26, 1900.)

(No Model.)

Fig. 1.

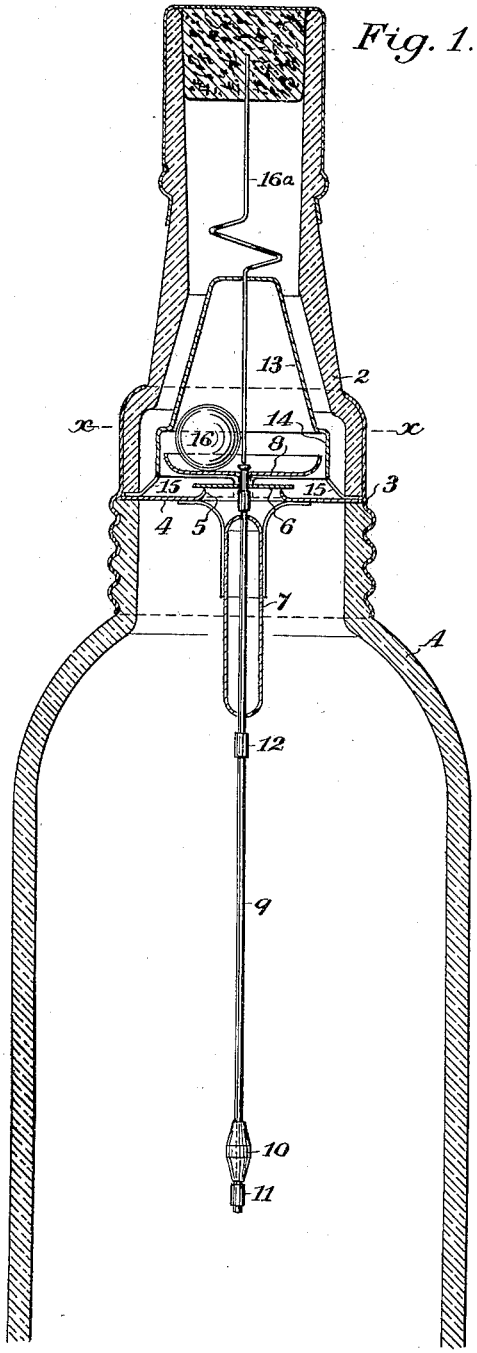


Fig. 2.

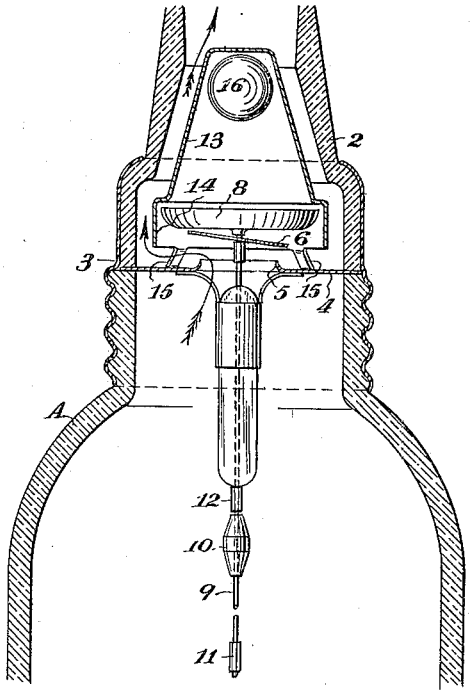


Fig. 3.

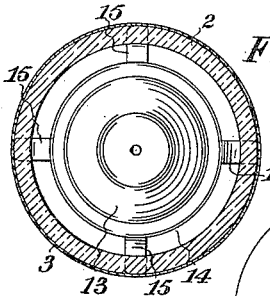
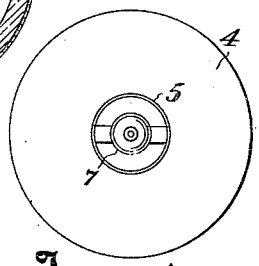


Fig. 4.



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UNITED STATES PATENT OFFICE.

FERDINAND FRANZ, OF SAN FRANCISCO, CALIFORNIA.

NON-REFILLABLE BOTTLE.

SPECIFICATION forming part of Letters Patent No. 676,715, dated June 18, 1901.

Application filed October 26, 1900. Serial No. 34,418. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND FRANZ, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Non-Refillable Bottles; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for preventing the refilling of bottles and like packages, and in conjunction therewith of a means whereby the closing-valve is opened by positive action when it is desired to discharge the contents of the bottle.

It consists of an annular disk having a central opening with upturned flange, the periphery of said disk fitting upon a corresponding surface of the bottle-neck for which it forms a closure. Through the central opening in the disk passes a rod having a second disk upon its upper end located at a short distance from the upturned flange of the first disk, and between the two is a loose valve which closes down upon the edge of the opening and prevents ingress or egress of the bottled contents. The top of the upper disk has an upturned flange around its edge, and a conically-shaped cap has legs or projections which fit upon the lower disk. The cone inclosing the smaller upper disk and valve and the openings between the legs of the cone allow for the escape of liquid when the bottle is to be emptied. Within the cone is a ball which normally rests upon the upper plate and by its weight assists in keeping the intermediate valve closed; but when the bottle is inverted to empty its contents as soon as the incline of the inside of the cone is lower than the horizontal line the ball will roll away from the plate, thus leaving it free. A guided rod is fixed to the upper disk and extends down through the opening of the lower disk and into the interior of the bottle. Upon this rod a weight is loosely slidable, and when the bottle has thus been tilted and the ball has rolled away from the upper disk this weight slides down the rod and striking a sleeve or collar thereon it acts by the concussion to force the closing-valve away from its seat, and thus allow the liquid to escape. Whenever the bottle lies in any position from the horizontal to an upright one, the ball will roll down the interior of the cone and press against the upper disk, so as to insure the closing of the valve and prevent the introduction of any liquid from the outside. These parts are all inclosed in an outer neck which is adapted to receive the cork or stopper, and the cone may have a small central opening in the top, through which an elastic wire fixed to the cork extends, and this wire pressing upon the top of the upper disk while the cork is in place prevents the valve being opened by any change in position of the bottle; but when the cork is removed it relieves the disk and allows the valve to be opened, as previously described.

My invention also comprises details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section through my improved bottle. Fig. 2 is a similar view, but showing the action of the interior mechanism when liquid is being poured out. Fig. 3 is a plan taken on the line x x of Fig. 1. Fig. 4 is a plan of the disk.

The bottle may be constructed in any suitable manner. In the present illustration I have shown the main part A having a sufficiently wide neck with a flat and preferably ground surface at the top. Upon this rests an independent neck portion 2, which is fitted upon the top of the bottle-neck, and may be cemented or otherwise attached after the interior parts are in place, and outside of these two is an inclosing band 3 of metal which holds the whole firmly together and prevents their being separated without the destruction of the band.

4 is a thin disk of sufficient diameter, so that its outer periphery rests upon the top of the bottle and is held in place permanently when the neck has been attached. The center of this disk has an opening, the edge being turned up to form a flange 5 with a thin edge which serves as a seat for the valve 6. This valve is loosely fitted upon a rod which extends down into the bottle and is guided, as at 7, so as to maintain it in the center of the opening in the disk 4. On the upper end of this rod is fixed another disk, as 8, of smaller diameter than the disk 4, and the loose disk 6 lies between the enlarged hub of

the disk 8 and a sleeve or collar fixed upon the rod just below. As the disk valve 6 is loose upon the rod and the space between the hub and collar or sleeve is sufficient for the purpose the valve may tilt and move freely in any direction, so that when the bottle is in an essentially upright position the valve will close down upon the edge of the valve-seat 5 and form a sufficiently tight joint to prevent escape of liquid. The rod 9 has a weight 10 slidable upon it. A collar or stop 11 limits the movement of this weight at the lower end of the rod, which is in this case shown to be near the bottom of the interior of the bottle, and another collar 12, fixed to the rod near the guide, receives the impact of the weight which slides upon the rod when the bottle is inverted, and this impact of the weight acts to force the valve away from its seat by a positive motion. In order to protect these parts from being tampered with and also to insure the valve remaining closed at all times except when the bottle is to be emptied, I have shown a cone 13, having an essentially cylindrical base 14 of larger diameter and projecting lugs or supports, as 15, which are adapted to rest and be secured upon the disk 4 and inclosing the upper disk 8, which is thus allowed to move freely inside the base of the cone.

Within the cone a ball 16 of considerable weight is freely movable, and when the bottle is in an upright position the ball rests upon the upper disk 8, the upturned edge or flange of which prevents its running off the disk while being put in place. The relation of the angular portion between the base of the cone and the cylindrical lower part is such that when the bottle is laid upon the side the ball will rest against this angle and will thus exert a pressure against the upper disk to keep the valve closed until after the bottle has been inverted to such an extent that the ball can roll up the convergent interior of the cone toward the upper end. As soon as this occurs it will relieve the disk, valve, and rod of the weight and pressure and will leave the valve free to be opened; but under ordinary conditions the capillary attraction or adherence caused by the liquid may prevent the valve from readily opening. At this juncture the weight 10, sliding upon the rod 9, will strike the sleeve or collar 12 with a sufficient force to insure the valve being forced away from its seat and the passage opened for the discharge of the liquid. The liquid thus escaping flows outwardly around the disk 8 and thence through the opening between the legs or projections 15 at the base of the cone and thence out through the neck of the bottle. The moment the bottle is tilted back to anywhere near the horizontal position the ball will roll down the divergent side of the interior of the cone and striking the disk 8 will again force the valve into a closed position, so that it will be impossible to force any liquid into the bottle in any position which it may occupy either submerged or otherwise.

The cone, the disks, and the general arrangement of the interior are such that it is not possible to tamper with the parts by wire or otherwise.

It is desirable after a bottle has been filled to prevent any escape of the liquid from the body of the bottle into the neck, and such escape might occur in a bottle stoppered and sealed, if it was inverted. I therefore fix the slender wire 16ª into the cork or stopper, and this passes through a small hole in the top of the cone. The wire may be bent or coiled so as to have a certain amount of elasticity, and the inner end of the wire will press against the upper disk 8 when the cork is in place and will thus prevent this disk and the valve being moved to allow the escape of the liquid through the passage which is closed by the valve. When the stopper is removed, the wire will also be withdrawn and the parts then released.

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

1. The combination with a bottle of an annular disk closing the upper end interior to the neck, said disk having an upturned flange around the central opening, a rod guided and slidable within said opening having a disk fixed upon its upper end and a valve intermediate the two disks adapted to close upon the edge of the opening.

2. The combination with a bottle of a disk closing the space interior to the neck and having a central opening with an upturned flange or seat, a rod guided and slidable centrally within said opening, a disk fixed to the upper end of said rod, a valve loosely movable upon the rod, and collars between which the valve is maintained in position so that it will close and fit upon the seat.

3. The combination with a bottle of a disk fitting and closing the space within the neck and having a central opening with an upturned flange forming a valve-seat, a rod guided and slidable centrally through said opening having a disk fixed upon its upper end, a valve loose upon the rod adapted to close upon the edge of the opening of the lower disk, and collars by which the valve is maintained in position, a weight slidable upon the rod interior to the bottle and collars or stops between which it is movable.

4. The combination with a bottle of a fixed disk closing the interior of the neck and having a central opening with an upturned flange forming a valve-seat, a rod guided and slidable centrally through said opening, the lower end extending into the interior of the bottle, a disk fixed to the upper end of the rod, a valve loosely carried upon the rod between the two disks and adapted to close upon the valve-seat by gravitation, a weight slidable upon the rod interior to the bottle and a collar or stop fixed to the rod near its guides

against which the weight strikes when the bottle is inverted so as to open the valve by positive stroke.

5. The combination with a bottle of a disk closing the interior of the neck having a central opening with upturned flange forming a valve-seat, a rod guided and slidable centrally within said opening extending into the interior of the bottle, a disk fixed to the upper end of the rod, a valve loose upon the rod between the two disks and closable by gravitation upon the seat of the lower disk, a hollow cone fixed upon the first-named disk and inclosing the upper disk and valve, said cone having escape-openings around its base and a ball contained within said cone adapted to rest upon the upper disk and maintain the valve in a closed position.

6. The combination with a bottle of a fixed disk closing the interior of the neck having a central opening with upturned flange forming a valve-seat, a rod guided and slidable centrally through said opening, the inner end extending into the interior of the bottle and carrying a slidable weight or hammer, a disk fixed upon the upper end of the rod having an upturned flange around its periphery, a valve loosely carried upon the rod between the disks and adapted to close upon the valve-seat by gravitation, a cone having an enlarged base and lugs or supports by which it is fixed upon the lower disk, a ball contained within the cone and resting upon the upper disk to retain the valve in closed position while the bottle is in any position between the upright and horizontal, said ball rolling on the convergent interior of the cone when the bottle is inverted so as to relieve the disk and valve of its pressure to allow the liquid to be discharged.

In witness whereof I have hereunto set my hand.

FERDINAND FRANZ.

Witnesses:
S. H. NOURSE,
CHAS. E. TOWNSEND.