No. 660,150. Patented Oct. 23, 1900.

J. R. DICE.

BOTTLE STOPPER.

(Application filed Aug. 19, 1899.)

(No Model.)

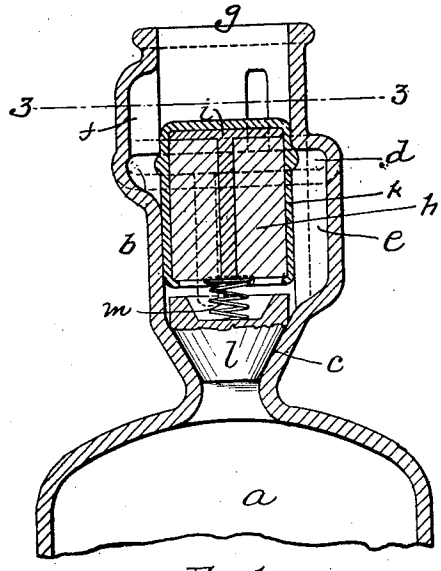

Fig. 1.

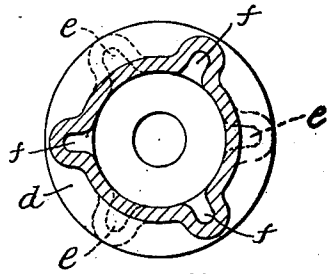

Fig. 3.

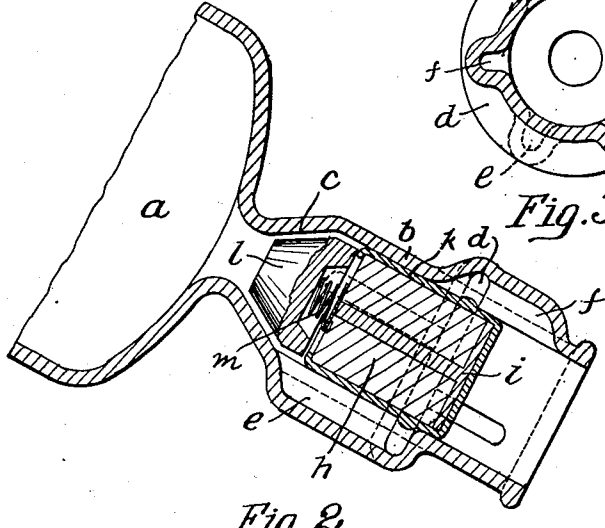

Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN R. DICE, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO JOHN PAPPERT, OF SAME PLACE.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 660,150, dated October 23, 1900.

Application filed August 19, 1899. Serial No. 727,776. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. DICE, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Bottle-Stoppers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to bottles and bottle-stoppers, its purpose being to provide a bottle and a stopper therefor which will preclude the refilling of the bottle with liquid after it has been once emptied, such bottles and stoppers having special use in connection with certain condiments or other liquids where the refilling of the bottles with spurious preparations may be attempted.

The object of the invention is to prevent refilling and at the same time to provide for the free entrance of air as the liquid is flowing from the bottle, so as to prevent the holding of the liquid within the bottle by vacuum, as often occurs.

The invention comprises a bottle having a neck provided with a valve-seat at its base and above the same a circumferential depression or groove and longitudinal grooves extending both upwardly and downwardly from the circumferential groove, but out of line with each other, in combination with an immovable stopper and a movable stopper or valve below the same, the movable stopper being made of unyielding material covered on its sides and top by a sheath of compressible material, so that when the valve is unseated the liquid flows through one longitudinal groove into the circumferential groove and then through another longitudinal groove, the unseating of the valve being effected by pressure of liquid within the bottle and not otherwise.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal section of the upper end of a bottle, showing the neck closed. Fig. 2 is a like view showing the neck open and in pouring position, and Fig. 3 is a transverse section on line 3 3 of Fig. 1.

Like letters indicate like parts in each of the figures.

The body *a* of the bottle is of course blown and finished in the ordinary way. Above the body *a* is the neck *b*, having at its base the tapering seat *c*. Some distance above this seat is the circumferential depression or groove *d*, from which the longitudinal depressions or grooves *e* (three being shown) extend downwardly toward the seat *c*, and the longitudinal grooves or depressions *f* (three being shown) extend upwardly toward the mouth *g*. While the grooves *e* and the grooves *f* communicate with the annular groove *d*, they are out of line with each other, as shown, and as the annular groove is in a plane at right angles to the grooves *e* and *f* if an attempt were made to insert any instrument through one groove *f* it would be impossible to work it over into line with and force it down a groove *e*. The bottle is provided with an immovable stopper *h*, formed of unyielding material covered with a sheath of rubber, leather, or other suitable material, as indicated at *k*, to expand into the groove *d* and lock the stopper in place. The immovable stopper when made of frangible material is protected by a metal cap *i*, secured to the top thereof, as illustrated; but ordinarily this cap is unnecessary. Below the stopper *h* is a movable stopper or valve *l*, which may be made of glass or other suitable material and is preferably ground, so as to form a tight joint with the seat *c*. Between the two stoppers is located a spring *m*, which forces the stopper *l* to place in the seat at all times when the bottle is empty and also when it is filled and in an upright position.

After the bottle is filled the stopper *l* is dropped into place. The stopper *h*, having the spring *m* attached to its lower end, is then pressed into place, the portion of the covering *k* adjacent to the groove *d* expanding into the groove and serving to hold the stopper securely in position, the bottle being then ready for shipment.

In use when the bottle is turned to the position shown in Fig. 2 the weight of the liquid moves the stopper *l* from its seat *c*, the spring *m* being sufficiently light to permit of this action, and the liquid runs down through the lower groove or grooves *e* into the annular groove *d* and around the same into the

nearest groove *f* and so out of the bottle. When so operating, the air can pass in reverse course through the upper groove or grooves *f*, thence around the upper part of the groove *d*, and thence through one or more of the grooves *e*, that are not filled with liquid. The stoppage of the flow of the liquid on account of external atmospheric pressure is thus avoided. It is impossible to so insert a wire or other instrument as to move and hold the stopper *l* from its seat, and thus permit of refilling the emptied bottle, because the instrument would have to pass down one groove *f* and then through the groove *d* at right angles thereto before it could enter any groove *e*, and when thus bent at right angles to the groove *f* it would obviously be impossible to insert it in the groove *e* and force it down the same.

By locating the liquid-passages in the bottle-neck instead of in the stopper I simplify and cheapen the construction and facilitate the flow of the liquid. Furthermore, the structure and location of the grooves are such that the danger of clogging is reduced to a minimum, and the liquid flows more freely and smoothly than it does from bottles having perforated stoppers.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A non-refillable bottle provided with a neck having a seat at its base, an annular groove above the same and longitudinal grooves leading downwardly and upwardly therefrom but out of line with each other, in combination with a stopper movable into and out of said seat, a non-removable stopper of unyielding material, and a compressible sheath covering the sides and top of said unyielding stopper and adapted to expand into the annular groove sufficiently to lock the stopper in position.

2. A non-refillable bottle provided with a neck having a seat at its base, an annular groove above the same and longitudinal grooves leading downwardly and upwardly therefrom but out of line with each other, in combination with a stopper movable into and out of said seat, a non-removable stopper of unyielding material covering said annular groove, a sheath of compressible material covering the sides and top of said unyielding stopper and adapted to expand into the annular groove to lock the stopper in position, and a spring between the two stoppers.

3. A non-refillable bottle provided with a neck having a seat at its base, an annular groove above the same and longitudinal grooves leading downwardly and upwardly therefrom but out of line with each other, in combination with a stopper movable into and out of said seat, a non-removable stopper of unyielding material covering said annular groove and provided with a metal cap, a compressible sheath of yielding material covering the sides of the unyielding stopper and the cap thereon and adapted to expand into the annular groove, and a spring interposed between the two stoppers.

In testimony whereof I, the said JOHN R. DICE, have hereunto set my hand.

JOHN R. DICE.

Witnesses:
GRACE C. RAYMOND,
ROBERT C. TOTTEN.