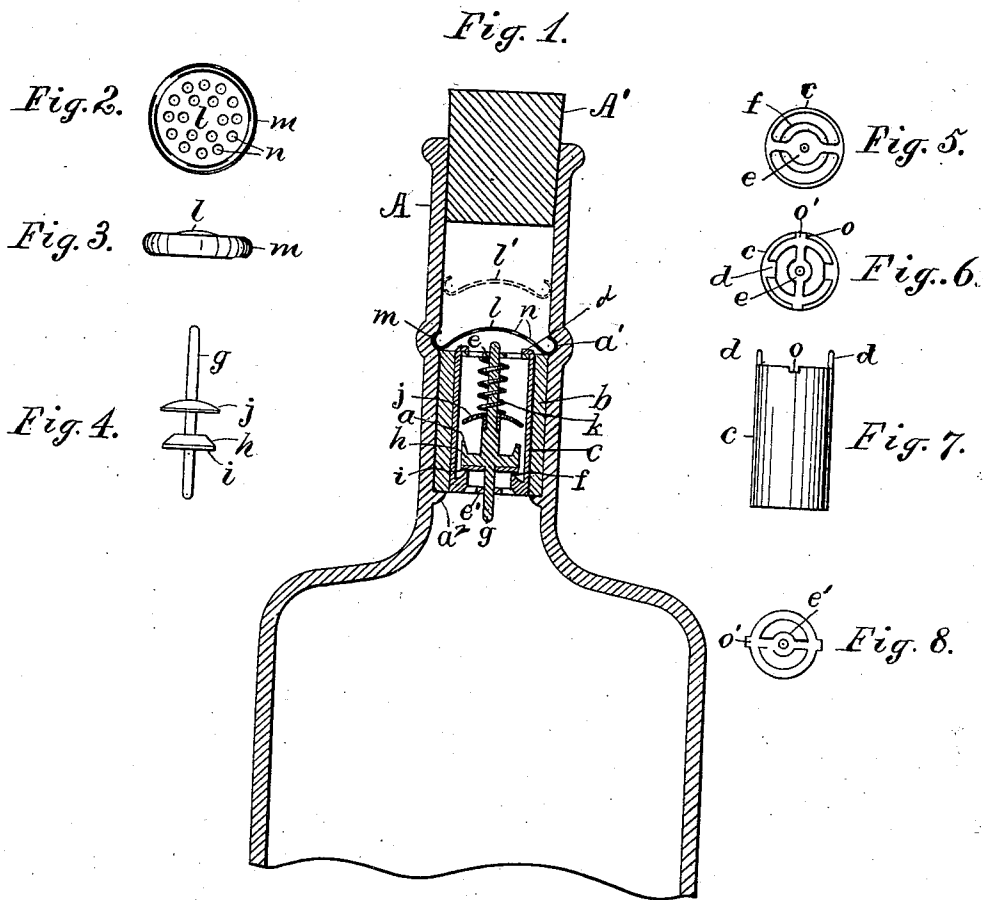


(No Model.)

A. C. KUSTER & W. HUPCHEN.
VALVE TO PREVENT REFILLING OF BOTTLES.

No. 536,214.

Patented Mar. 26, 1895.



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UNITED STATES PATENT OFFICE.

AUGUST C. KÜSTER, OF CANARSIE, AND WILLIAM HUPCHEN, OF BROOKLYN,
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VALVE TO PREVENT REFILLING OF BOTTLES.

SPECIFICATION forming part of Letters Patent No. 536,214, dated March 26, 1895.

Application filed September 22, 1894. Serial No. 523,776. (No model.)

To all whom it may concern:

Be it known that we, AUGUST C. KÜSTER, residing at Canarsie, and WILLIAM HUPCHEN, residing at Brooklyn, Kings county, New York, citizens of the United States, have invented certain new and useful Improvements in Bottle-Valves to Prevent Refilling of Bottles, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to furnish an improved means to prevent the refilling of bottles, and the invention consists in various improvements in the bottle neck, the valve seat, the valve, and the means for securing the valve in the bottle as hereinafter described and claimed.

In the annexed drawings; Figure 1 is a vertical section of a bottle neck provided with the improvements. Fig. 2 is a plan, and Fig. 3 an edge view, of the locking strainer; Fig. 4, a side view of the valve and its attachment; Fig. 5, a plan of the valve tube at the upper end. Fig. 6 shows the bottom end of the same. Fig. 7 shows the exterior of the valve tube, turned ninety degrees from the position shown in Fig. 6, and Fig. 8 is a plan of the bottom valve-guide.

The bottle neck A is shown formed internally with an annular collar or seat a^2 , and at a higher level with an annular groove a' . These are arranged at opposite ends of annular packing b which embraces the valve tube c . The packing may be made of any suitable material, and holds the valve tube in position by its grasp, as shown in Fig. 1. The tube is formed at the top with two lugs d adapted to hold an insertible valve guide e within the top of the tube. The valve seat f is formed with a circular thin edge, turned upwardly to present a sharp corner to the under side of the valve. The valve-guide e is secured within the upper part of the valve tube by bending the lugs d over the guide, as shown in Fig. 1. A valve-guide e' is formed in the bottom of the tube below the valve seat, and the valve spindle g is formed to play through the guides and is provided with the valve disk h , which is shown with facing i of soft material to make a joint upon the valve seat. Above the

valve, the spindle or stem g is provided with a concave disk j having its hollow side toward the valve. The disk j is preferably made as a separate fixture, and slipped upon the valve stem above the valve h , with an intervening space between the two, as shown in Fig. 1, and a spring k is applied to the valve stem between the disk j and upper guides e , and presses the valve normally toward the seat f . The spring is carefully proportioned to just balance the entire weight of the valve, its stem g and disk j , so that the pressure of any liquid below the valve may open the same freely, while the pressure of any liquid above the valve forces it against the seat.

A locking device adapted to serve as a screen is applied over the valve tube, and serves the double function of locking the valve tube in place, and protecting the valve stem from the access of any tool for holding the valve open. The screen consists of a disk l of suitable material to expand within the bottle neck, and having annular curved flange m at the margin, made of suitable size to pass downward in the bottle neck, as indicated by the dotted lines l' in Fig. 1; the flange m being then expended to fit the groove a' . The center of the screen is made solid, to protect or cover the top of the valve stem; and holes n are formed outside of the central portion, to permit the passage of the liquid.

The valve may be formed of a plain disk, as shown in Fig. 4, but it is preferable to form it with a thin upturned flange a , as shown in Fig. 1, to which the liquid clings in passing outward, and is thus directed positively toward the pusher-disk j .

All the parts exposed to the liquid may be made of block tin or other material not affected by the liquid, and where it is admissible the valve is faced with the washer i of india-rubber or leather, to form a joint without closely fitting the parts. The packing sleeve b may be made of cork or other suitable material, and the neck may be closed by cork A' .

The parts are fitted together by inserting the valve stem and its attached parts within the tube, then fitting the upper guide e into the tube; which would be formed with notches

o to receive lugs o' upon the guide, and the lugs d are then bent over the guide. The valve tube with the packing b is then forced into the bottle neck in contact with the collar a². The screen l is then placed within the bottle neck, and the flange m is expanded, by suitable tools, into contact with the inner side of the groove a'; thus locking the screen firmly within the bottle neck and wholly preventing any access to the valve or valve tube beneath. The expanding of the screen flange into the groove secures the valve fixtures permanently within the bottle neck and prevents the removal of the valve tube.

15 When the bottle is tipped to pour out the contents, the weight of the valve not only serves to balance the spring k; but the movement of the fluid through the valve tube, brings the fluid into contact with the pusher disk j; thus producing an additional pressure upon the spring to hold the valve open.

The space between the valve and the pusher disk permits the fluid to entirely pass the valve before it touches the pusher disk; thus involving a double impact of the liquid upon the valve and disk in its discharge from the bottle.

The pusher disk performs an equally useful function in preventing the refilling of the bottle, as any liquid introduced from the exterior of the bottle first strikes the disk, and thus assists in pressing the valve upon its seat. To perform these functions most effectively, the disk is made a little larger than the valve, with space at its outer edge barely sufficient to permit the outward passage of the fluid.

The collar a² is not at all essential to the operation of the device; but affords a convenient stop to the downward movement of the valve and its packing, when forced into the neck, and thus adjusts them adjacent to the screen. The functions of the screen are, however, wholly independent of any particular adjustment of the valve tube within the bottle neck; the screen protecting the valve, at whatever distance it may be above the same. The whole construction is simple and effective.

The perforated sheet metal screen, having an annular curved flange adapted to expand into a groove within the bottle neck, may be used with valves of other constructions. The valve tube c, containing the valve seat, the valve guides, the valve and its screen, constitutes a complete article ready for application, with an annular packing, to any bottle having a neck of suitable size; and we have therefore

claimed such valve as a new article of manufacture.

What is claimed herein is—

1. As a new article of manufacture, a bottle valve adapted for securing within a bottle neck with an annular packing, and comprising the straight cylindrical valve-tube c having the integral valve seat and valve rod guide in the bottom, and integral flexible lugs d at the top, the guide e fitted in the top of the tube and secured by the lugs d bent downward over the outside of the same, and the valve h fitted to the valve seat and having the valve stem g fitted to such guides, and a spring applied to the valve stem between the valve and the guide e, substantially as herein set forth.

2. As a new article of manufacture, a bottle valve adapted for securing within a bottle neck with an annular packing, and comprising the straight cylindrical valve-tube c having the integral valve seat and valve rod guide in the bottom, and separate guide e secured within the top of the tube, the valve stem g fitted to the guides and provided with the valve h, and the concave pusher disk j secured upon the stem adjacent to the valve with space between the two, and a spring inserted between the disk and the guide e, substantially as herein set forth.

3. A bottle valve adapted for securing within a bottle neck with an annular packing, and comprising the valve tube c having suitable guides at the ends, and valve seat in the bottom, and the valve stem fitted to the guides and provided with the valve h having the upturned flange a, and the concave pusher disk j secured upon the stem adjacent to the valve with space between the two, and a spring inserted between the upper guide and the disk, as herein set forth.

4. A bottle having the neck provided with the collar a² and groove a', the bottle valve tube c, and the packing b supported upon the collar, a seat and valve within the valve tube, and a perforated metallic screen having the edge expanded within the groove, substantially as set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

AUGUST C. KÜSTER.
WILLIAM HUPCHEN.

Witnesses:

THOMAS S. CRANE,
EDWARD F. KINSEY.