

(No Model.)

J. CONNER.
BOTTLE STOPPER.

No. 382,459.

Patented May 8, 1888.

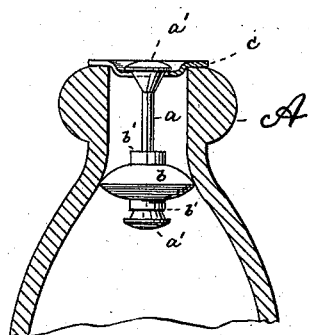


FIG. 4

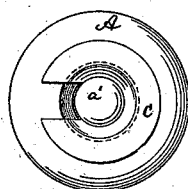


FIG. 5



FIG. 6

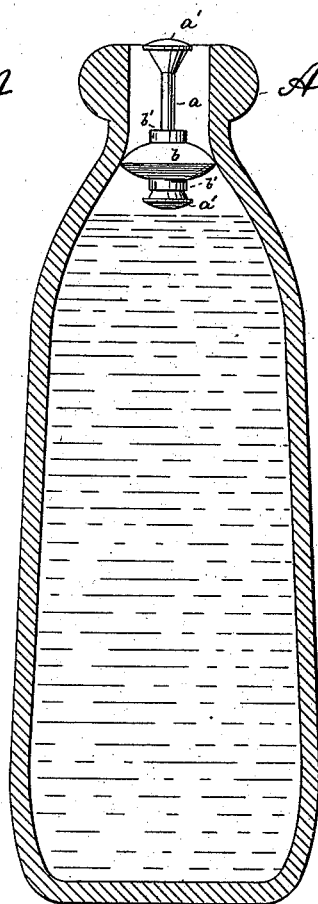


FIG. 1

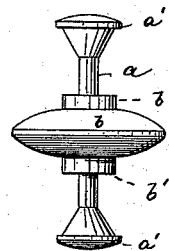


FIG. 2

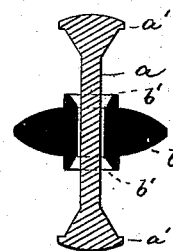


FIG. 3

WITNESSES

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JOSEPH CONNER, OF NEW YORK, N. Y.

BOTTLE-STOPPER.

SPECIFICATION forming part of Letters Patent No. 382,459, dated May 8, 1888.

Application filed February 20, 1888. Serial No. 264,620. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH CONNER, of New York city, New York, have invented a new and Improved Bottle-Stopper, of which the following is a specification.

This invention relates to that kind of bottle-stoppers that are used for internally closing bottles filled with charged fluids. These stoppers are held against the neck of the bottle by the pressure of the gas, and drop to the bottom of the bottle when such pressure is taken away.

More particularly does my invention relate to those internal stoppers which are combined with the packing and do not use a packing within the neck of the bottle.

My invention consists in a reversible stopper in which the valve-stem is surrounded by and free to move within the packing, all as will be more fully pointed out in the claim.

In the accompanying drawings, Figure 1 is a vertical central section of a bottle closed by my improved stopper, the latter being shown in side view. Fig. 2 is an enlarged side view of the stopper. Fig. 3 is a vertical central section of the same. Fig. 4 is a side view of the stopper when used in connection with the locking-disk, the latter being shown in section. Fig. 5 is a top view of Fig. 4; and Fig. 6, a top view of the disk.

The letter *a* represents a valve-stem made of a material that will sink in water—such as metal, glass, or hard rubber. This stem carries at each end a lobe or projection, *a'* constituting a valve, such valve being preferably of conical shape in cross-section, as shown in Fig. 3. The stem *a* is surrounded by a flexible packing-ring, *b*, preferably of soft rubber and shorter than the stem *a*, so that the latter has a vertical motion within the packing. From the top and from the bottom of packing *b* there extends a tubular projection, *b'*, in one piece with the packing. Each of the tubes *b'* is therefore also flexible, and each has a flaring mouth constituting a valve-seat that corresponds in shape to that of its valve *a'*. The central bore through packing *b*, that contains stem *a*, should be somewhat greater in cross-section than the cross-section of stem *a*, Fig. 3, to permit the discharge of gas when the

valves are open. The packing *b* is bulged outward on top and bottom to form two convex but flattened semi-spherical surfaces that recede from the center of the packing toward its poles.

In use the entire stopper is permanently contained within the bottle *A*, and the latter is filled with charged fluid in the manner in which bottles with internal stoppers are usually filled. When the bottle has been charged, the stopper will be in the position shown in Fig. 1—that is to say, the packing *b* will be held against the neck of the bottle and the lowermost valve, *a'*, will be pressed against the lowermost valve-seat, *b'*, thus effectively closing the bottle. If the bottle is to be opened, a slight pressure on upper valve, *a'*, by the finger will open the lower valve, thus permitting the escape of the gas, and thereby removing the pressure that held the stopper in place, so that the latter will drop to the bottom of the bottle.

In Figs. 4 to 6 I have shown an attachment that may be used in connection with my improved stopper. This consists of a disk, *c*, having a radial slot and slightly depressed at the center. This disk may be slipped under the upper valve of the stopper and made to rest upon the upper flange of the bottle, as shown in Fig. 4. In this way the valve-stem is held up, and the valve cannot be opened by an accidental pressure from above or by a diminution of pressure from below. Of course the disk must be withdrawn before the bottle can be opened.

It will be seen that as the tubes *b'* are formed in one piece and out of the same material as packing *b*, they form flexible seats for their valves, and the valves will thus tightly close upon their seats. The advantage of having the valve-seats in the tubes *b'* is, that any pressure on the packing *b* will not be imparted to the tubes *b'* to contract or alter the shape of the valve-seats, and thus the motion of the valve-rod will always be undisturbed. Another advantage of making the tubes *b'* in one piece with the flexible packing is, that the rod *a*, with its valves, may be cast in one piece complete, and may then be introduced through the packing by temporarily stretch-

ing the packing and tubes apart, so that the central opening is increased in width to allow one of the valves a' to pass.

I claim as my invention—

- 5 The combination of rigid stem a , carrying conical valves a' , with perforated flexible packing b , having rounded surfaces, and with the flexible tubular projections b' , extending from

opposite sides of packing b , and made in one piece therewith, the tubular projections b' to having conical valve-seats, substantially as specified.

JOSEPH CONNER.

Witnesses:

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