F. J. SEYBOLD.

BOTTLE-STOPPERS, &c.

No. 195,849. Patented Oct. 2, 1877

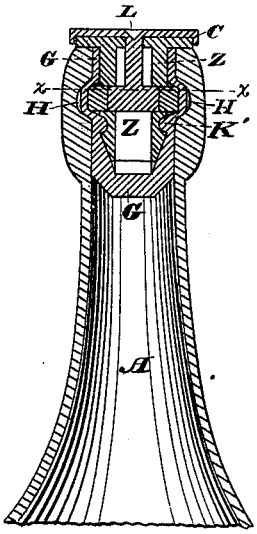


Fig. 1

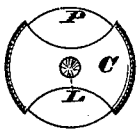
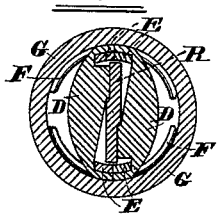


Fig. 2

Fig. 3



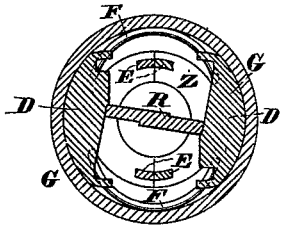


Fig. 4

Fig. 5

Fig. 6

Fig. 7

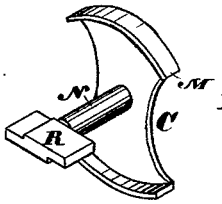


Fig. 8

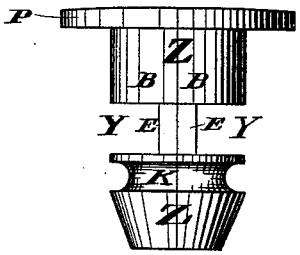


Fig. 9

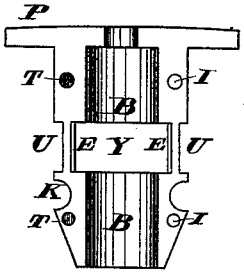


Fig. 10

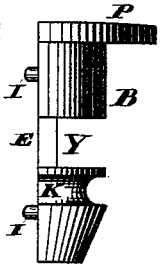


Fig. 11

Attest:

John S. Gorton.

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UNITED STATES PATENT OFFICE.

FREDERICK J. SEYBOLD, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN BOTTLE-STOPPERS, &c.

Specification forming part of Letters Patent No. **195,849**, dated October 2, 1877; application filed June 5, 1877.

To all whom it may concern:

Be it known that I, FREDERICK J. SEYBOLD, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bottle-Stoppers and Bottle-Stopper Fasteners, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My invention pertains to that class of articles known as "bottle-stoppers" and "bottle-stopper fasteners;" and consists, in a general way, of a rubber tube, closed at one end, (the inner end when in the bottle,) fitting over a metal or other tube, very much as a ferrule fits over the end of a whip-stalk, or, in popular language, as a finger-stall fits over the finger. The two tubes, one inclosed in the other, are inserted in the bottle like any ordinary cork. The inside tube has a flange on one end of it, (the outer end when in the bottle,) that reaches out over the lips of the mouth of the bottle and prevents the tube from passing entirely into the bottle. The rubber tube comes up over the inner tube (made of metal or other suitable material) to the flange on the inside tube—that is, to the top of the mouth of the bottle. At some point between the two ends of the inner tube sections are cut into the same through the circumference. Into these orifices thus made are placed pieces of metal or other suitable material, somewhat in the shape of segments of a circular plate. Into the inner tube is inserted, from the top, a shaft reaching down to the segments of a circular plate inserted through the orifices of the inner tube. On the lower end of this shaft are arms that lie in between the segments aforesaid. On turning this shaft, and with it these arms, the arms pressing against the segments force their circumferences out through the orifice of the inner tube against the rubber that incloses the inner tube, and presses the rubber outward at the points lying over these segments of a circle, causing a ridge to appear on the circumference of the rubber tube, and this ridge is pressed into the groove in the inside of the neck of the bottle, constructed for this purpose. This locks the stopper in the bottle, and prevents it from being forced out of the bottle by gaseous or fermenting liquids therein.

In the drawing, Figure 1 represents an inside view of a vertical section of the neck of the bottle containing one of my stoppers. Fig. 2 represents a top view of my bottle-stopper. Fig. 3 represents a top view of a horizontal section on the line *x x*, Fig. 1, the segments D D being closed or lying inside of the inner tube. Fig. 4 represents a view of the same section as in Fig. 3, with the segments D D expanded or thrown out through the orifices in the inner tube, and against the rubber, so as to press the same outward into the groove mentioned in the inside of the neck of the bottle.

Fig. 5 is a top view of one of the segments D aforesaid. This segment may be shaped differently from that shown in the drawing; but I find this shape to be the most convenient for the size here used, and to most conveniently accomplish certain movements pertaining to the operation of the stopper that I will more particularly describe farther on.

Fig. 6 is a view of the inner edge of the segments D. Fig. 7 is a view of the outer edge of the segments D.

Fig. 8 represents the shaft and arms that expand or throw out these segments, R being the arms that throw out the segments D against the rubber tube; N, the shaft or shank to which the arms R are attached, and C the handle that reaches over the top of the bottle and forms a hand-hold in turning the shaft; M being flanges on the outer edges of this handle C, and turn down over the top of the tubes.

Fig. 9 represents the inside tube. Fig. 10 is a front view of a vertical section through the center of the tube shown in Fig. 9, showing one-half of the inner tube. Fig. 11 is a side view of the same section as Fig. 10.

In Fig. 1, A is the neck of the bottle. G is the outer tube, made of rubber or other flexible material, constructed with the shoulder K′, that fits into the groove K in the inner tube. Z is the inner tube, made of metal or other hard substance. H is a groove in the inside of the neck of the bottle, into which the rubber or otherwise flexible outer tube is compressed by the segments D, which are thrown out by the arms R.

C is the handle to the shaft, to which the arms are attached. This is seen more fully in Fig. 8. L is an indenture in the top of the shaft N, into which the point of the plunger

of a soda-bottling machine fits to drive this stopper down into the bottle. The point of the plunger resting on the shaft, the pressure of the plunger does not create so much friction but that the shaft is easily turned by the handle C while the plunger is pressing down on the same.

In Fig. 2, P is the flange on the top of the inner tube that reaches out and covers the top of the bottle. This flange closes the inner tube entirely, with the exception of a small hole through the flange P, through which the shaft N passes. The outer flexible tube G reaches up to and against this flange P on the inner tube.

In Fig. 3, D are the segments that press outward against the rubber or otherwise flexible outer tube. R are the arms that throw these segments out. G is the rubber. F are also segments of a circle, and are laid around the segments D in the groove W, which may be seen distinctly in Figs. 6 and 7.

As the segments D are pressed outward they press outward the segments F also against the rubber. By means of these additional segments F a complete circle is formed when the segments D are thrown out. These segments F are not so thick as the segments D, but are of such a thickness that they may fit in the grooves W, Figs. 6 and 7. The manner in which the segments F complete the circle when the segments D are thrown out is seen more fully in Fig. 4, which presents a different view of the same section, as shown in Fig. 3. The two figures differ only in this, that in Fig. 3 the segments D are closed in, and in Fig. 4 the segments D are thrown out.

In Fig. 8, R are the arms on the bottom of the shaft N that throw out the segments D. These arms may be of a different shape from what is here represented; but I find this shape as convenient as any other.

There are two arms, R, here represented; but there may be more than two, if desired, and correspondingly the segments D may also be three or four in number, or a still higher number, if desired. There should be the same number of segments D as arms R.

In operation I find that the working of the apparatus is more satisfactory when only two or three segments are used. All things considered, I prefer to use only two segments operated by the arms R, and use the additional segment F to complete the circle, the segments F being operated by the segments D.

In Fig. 9, P is the flange on the top of the inner tube Z. This flange rests out over the top of the bottle. B is the body of the tube Z going down into the bottle, and is surrounded by the rubber tube G. This tube Z is constructed, preferably, to facilitate casting, in two halves. A cut, Y, is made into each half, into which the segments D are inserted, and out of and in which they slide as the arms R are turned against or from them. These cuts Y nearly separate the tube horizontally, leaving connected the upper and lower parts simply by the stem or stems E. K is a groove in the lower part of the tube Z, into which fits the shoulder K′, cast on the inner surface of the outer or rubber tube. This shoulder fits into the groove K, preventing the outer tube from slipping off the inner tube. The two halves of the inner tube Z are held together firmly by this incasing rubber tube.

In the drawing, in Fig. 10, I are dowel-pins, that fit into the corresponding dowel-holes T, thereby preventing either half of the inner tube from sliding on the other up or down or laterally. These pins I are seen more distinctly in Fig. 11. The outer edge of the stem E (seen in Figs. 9, 10, and 11) is cut away, leaving the stem standing a little way in from the circumference of the tube Z. In these spaces thus left between the stem E and the incasing outer tube lie the segments F, outside of the stem E. This space is seen distinctly at U in Fig. 10. O, in Fig. 5, is a shoulder in the segments D, against which the arms R strike as they turn around when pressing the segments D outward. This shoulder O prevents the arms from going farther after they have gotten to the proper position, and when the segments D are at their farthest outward point. This shoulder O allows the arms R to pass a little beyond the center before stopping them, so that the backward contractile pressure of the rubber against the segments D tends to tighten the arms R against the shoulder O, instead of throwing the arms back the other way, and thus the pressure of the rubber holds the segments securely locked in their outer position. To allow them to return back again to their inner position it is only necessary to turn the arms back from the shoulder, when the rubber will itself throw the segments in toward the center. To put this bottle-stopper together after the parts are constructed, it is simply necessary to lay one half of the tube Z down with its concave side upward, laying on the same in its proper position the shaft C N R; then lay on the other half of the tube Z, and place the segments D and F in their proper places, slipping the outer or rubber tube over the inner tube with the various parts entirely incased within, and the stopper is complete. Then by simply inserting the same in the bottle, and turning the handle C till the arms R strike the shoulder O of the segments D, the stopper is locked in the groove H.

I have so far in this description designated the vessel A as a bottle; but I do not wish to confine myself to a vessel technically denominated a bottle, but wish to use the stopper with any vessel for containing fluids or liquids, and desire to claim the use of this stopper, constructed, as I have shown, in combination with any vessel, be it bottle, jar, flask, cask, keg, barrel, or any other vessel whatever.

I have so far in this description designated the outer tube G as a rubber tube; but I do not wish to confine myself to rubber as material of which to make this tube, but desire to claim for this purpose the use of any flexible or expansive

or contractile substance that will answer the purpose, among which may be rubber and gutta-percha.

It is not designed that the segments D will necessarily and inevitably throw out the rubber so as to entirely fill the groove H, and press against the outer edge of the same so as to be air or fluid tight at that particular point of the stopper, as it is not designed to make the pressure of the segments D against the rubber so great as to stop or cork the bottle, but only throw the rubber out into the groove H, so as to lock the stopper in the bottle, so that any upward pressure from below against the stopper will drive the rubber, incased segments D against the top of the groove H, which will prevent the stopper from being blown out from the bottle by gases from within; and it is designed that the stopper will fit the bottle so tightly below and above the groove H as to prevent any escape of fluid or air out of or into the bottle.

From this it will be seen that it is not necessary that the segments D, when thrown out, should form a perfect circle so as to fill the groove H; and that if the auxiliary segments F were entirely dispensed with, the arms R and segments D would subserve the purpose of locking the stopper in the bottle completely; and in fact the segments D themselves could be dispensed with, and the arms R be made to subserve the purpose of locking the stopper in the groove H, they (the arms R) being themselves made on the cam principle, or to work on the cam principle. The segments D and F and lever C N R and the inner tube Z may be of any suitable material desired.

This stopper is designed for a general and almost universal use, and can be used alike for soda or other gaseous fluids, mineral water, beer, or fermented liquors, and in fact almost all fluids.

The securely locking and fastening of this stopper in the bottle does not depend upon the upward pressure of the liquid in the bottle, as is the case with many stoppers; but it is securely locked in the bottle whether the bottle contains liquid or not.

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

1. The tube Z, constructed with the body B and stem or standard E, in the manner shown and described, and for the purpose set forth.

2. The tube Z, constructed with the flange P, body B, stem or standard E, and groove K, as shown and described, and for the purpose set forth.

3. The lever C N R, constructed with the handle or hand-piece C, shank N, and arms R, as shown and described, and for the purpose set forth.

4. The segments D, constructed with the shoulder O or its equivalent, as shown and described, and for the purpose set forth.

5. The flexible tube G, constructed with the shoulder K′, as shown and described, and for the purpose set forth.

6. The lever C N R, in combination with the segments D and the tube Z, in the manner shown and described, and for the purpose set forth.

7. The lever C N R, in combination with the segments D, the tube Z, and the segments F, in the manner shown and described, and for the purpose set forth.

8. The combination of the tube Z with the tube G, in the manner shown and described, and for the purpose set forth.

9. The combination of the tube Z with the tube G and lever C N R, in the manner shown and described, and for the purpose set forth.

10. The combination of the tube G with the tube Z, lever C N R, and segments D, in the manner shown and described, and for the purpose set forth.

11. The combination of the tube G with the tube Z, lever C N R, segments D, and segments F, in the manner shown and described, and for the purpose set forth.

12. The bottle-stopper consisting of the tube G, the inner tube Z, lever C N R, and segments D, in combination with a bottle, flask, jar, cask, keg, barrel, or other vessel, A, in the manner shown and described, and for the purpose set forth.

FREDERICK J. SEYBOLD.

Witnesses:
JOHN S. GORTON,
HENRY C. STRONG.