3 Sheets—Sheet 1.

H. N. GALE.

BOTTLE-STOPPER.

No. 192,117. Patented June 19, 1877.

Fig. 1.

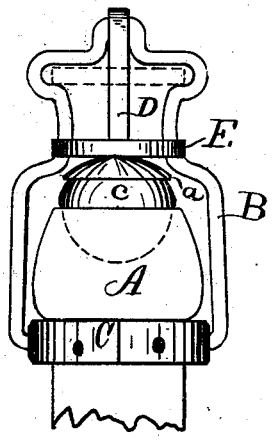


Fig. 2.

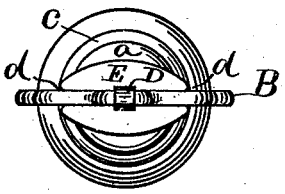


Fig. 3.

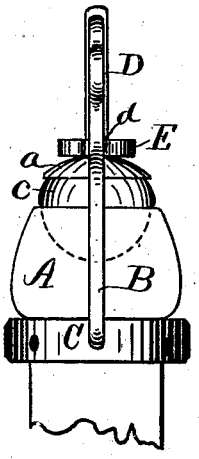


Fig. 4.

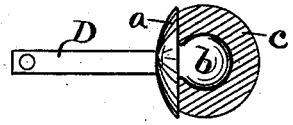


Fig. 5.

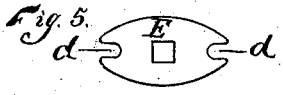


Fig. 6.

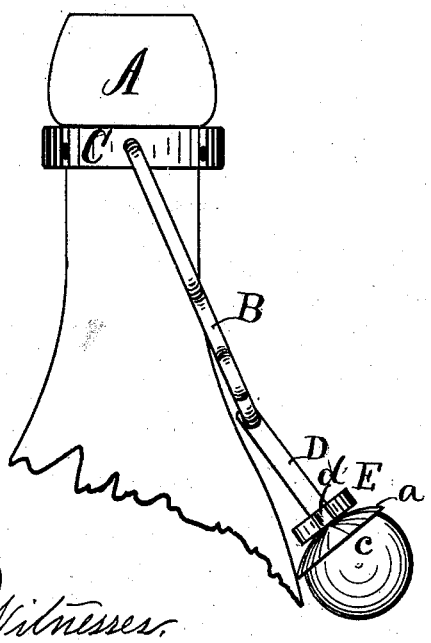


Fig. 7.

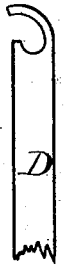
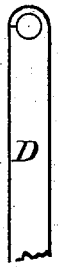


Fig. 8.



Witnesses.

L. S. Burr
D. Judd.

Inventor.

Herbert N. Gale.
By James Shepard Atty

3 Sheets—Sheet 2.

H. N. GALE.

BOTTLE-STOPPER.

No. 192,117. Patented June 19, 1877.

Fig. 7.

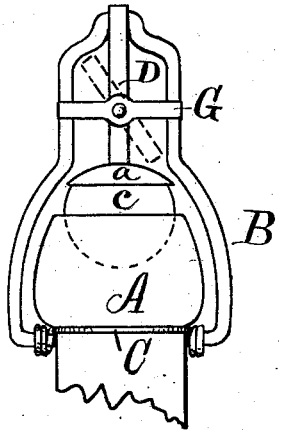


Fig. 10.

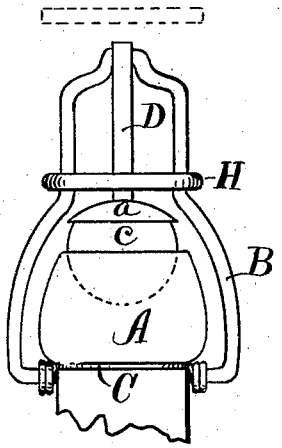


Fig. 11.

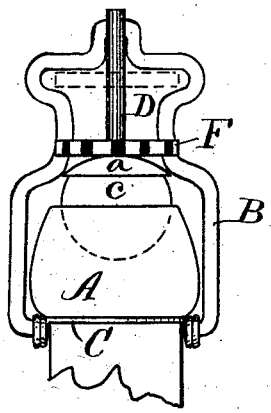


Fig. 12.

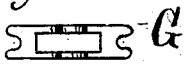


Fig. 13.

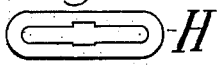


Fig. 14.

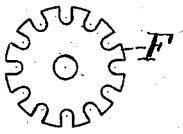


Fig. 15.

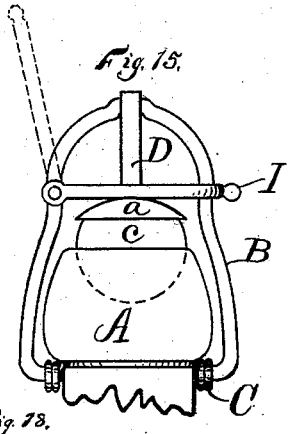


Fig. 16.

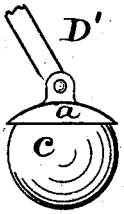


Fig. 17.

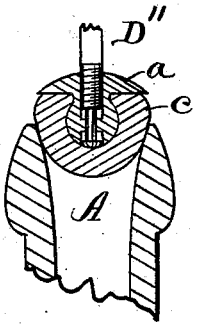
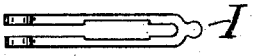


Fig. 18.



Witnesses

S. S. Burr
D. Gladd.

Inventor.

Herbert N. Gale.
By James Shepard Atty

3 Sheets—Sheet 3.

H. N. GALE.

BOTTLE-STOPPER.

No. 192,117. Patented June 19, 1877.

Fig. 19.

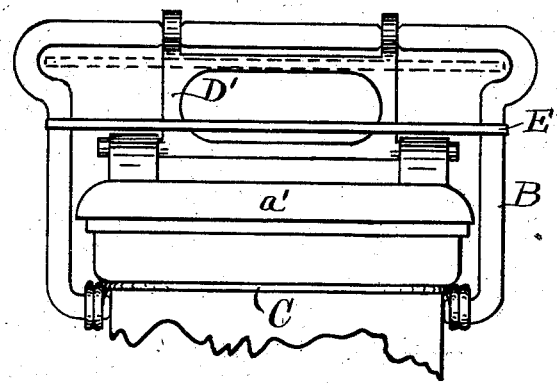
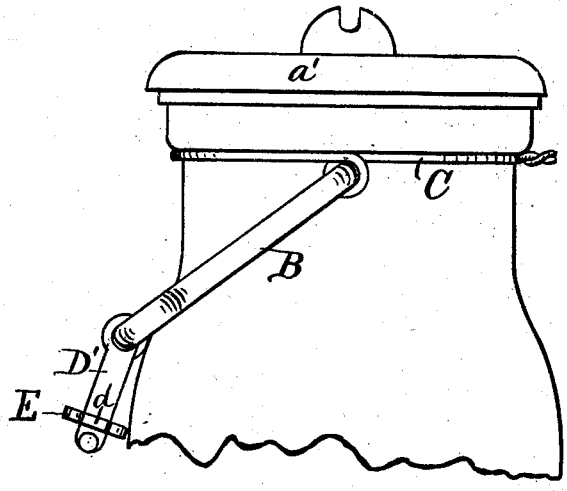


Fig. 20.



Witnesses.

S. S. Burr

D. C. Judd.

Inventor.

Herbert N. Gale

By James Shepard Atty.

UNITED STATES PATENT OFFICE.

HERBERT N. GALE, OF BRISTOL, CONNECTICUT.

IMPROVEMENT IN BOTTLE-STOPPERS.

Specification forming part of Letters Patent No. **192,117**, dated June 19, 1877; application filed May 14, 1877.

To all whom it may concern:

Be it known that I, HERBERT N. GALE, of Bristol, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Bottle-Stoppers, of which the following is a specification:

My invention consists in the novel parts and combination of parts, as hereinafter described.

In the accompanying drawing, Figure 1 is a front elevation of a bottle-stopper which embodies my invention. Fig. 2 is a plan or top view of the same. Figs. 3 and 6 are side elevations of the same. Figs. 4, 5, 7, and 8 are views of detached parts of the same. Figs. 9, 10, 11, and 15 are front elevations of different styles of the same, and Figs. 12, 13, 14, 16, 17, and 18 are views of detached parts and various modification of parts.

A designates the head or upper end of a bottle; B, the swinging yoke or bail; C, the collar to which it is hung; D, the non-jointed link with cap-plate and cushion attached; and E, the locking device for locking the parts in place.

The collar C, which embraces the neck of the bottle just under its head A, may be formed of malleable iron, with a series of bearings for the lower ends of the yoke or bail B, or of wire with only one pair of yoke-wire bearings, or in any other ordinary manner that may be desired.

The cap-plate *a* and its spherical head *b*, Fig. 4, are formed on the end of the non-jointed link D preferably all of one and the same piece of metal.

The elastic cushion *c*, made hollow, so as to be drawn over the head *b* and retain itself in place, is of spherical form, with its upper side cut off to fit the under side of the cap-plate *a*, as shown.

The body of the link D is rectangular in cross-section, and fitted to said body so as to slide up and down thereon but not to turn. On said rectangular link is the locking-plate E, having notches *d d* at each end, as shown in Fig. 5, of a size to receive the body of the yoke or bail.

The form of the yoke or bail is shown in the front elevation, Figs. 1 and 11, in which it will be seen that there is a short horizontal bearing to which the upper end of the link D is hung, so as to swing thereon, and upon each side of said bearing is a shoulder to prevent said link from working sidewise out of place. Just below these shoulders the distance between the two arms of the yoke is widened, so that the ends of the locking-plate E may readily pass between them at that point, as indicated by the broken lines in Fig. 1, and then contracted until reaching a point just above the cap-plate *a*, when they again widen so as to clear the head of the bottle, all as shown in said figures.

In Fig. 6 the parts are represented in the position in which they are when the bottle is opened. To close the bottle the yoke is lifted and carried over the head A to a point a little beyond a perpendicular, when the spherical cushion *c* will fall into the mouth of the bottle. The lock-plate E is then slipped upward on the body of the link to the point indicated by broken lines in Fig. 1, and the upper end of the link and yoke are brought with power back into a position directly over the center of the bottle, as shown in Figs. 1, 2, and 3, the power or sidewise pressure against the yoke being transmitted through the link D to press the cap-plate and its spherical cushion firmly into the mouth of the bottle to close it air-tight. The lock-plate E is then forced downward, with the two arms of the yoke entered in the notches *d d*, and the plate allowed to rest at the point shown in Figs. 1 and 3, when it locks the parts firmly in place, so that it is impossible to remove the cap, or throw the yoke sidewise to remove it without first lifting the locking-plate far enough to pass between the wide space at the top of the yoke.

The lower contracted portion of the yoke may be so fitted as to press against the bottom walls of the slot, when the friction thus created will tend to prevent the accidental displacement of the lock-plate. By raising the lock-plate so that it may pass between the arms of the yoke, and pressing the latter sidewise, the parts will fall into the position represented in Fig. 6.

If desired, the body of the link toward the top may be fitted to the plate E so snugly that when said plate is forced up into posi-

tion for uncapping the mouth of the bottle, the friction will cause said plate to stay in position, and the yoke can then be forced sidewise to uncap the bottle without having to hold up the plate with the hands.

By making the cushion spherical it is much better adapted for use with a non-jointed link, as it can easily roll on the mouth of the bottle, and fits it the same when the link is inclined to one side as it does when said link is straight up, unless under varying pressure. In bringing the non-jointed link and cap-plate from an inclined position to an upright one, the cushion must necessarily slip on the mouth of the bottle, or roll thereon after the manner of a ball-and-socket joint.

It is well known that rubber, the material of which the cushion is made, slips upon objects much better when it is wet than when otherwise. A newly-filled bottle, or one from which liquid has just been drawn, will be in a condition best adapted for this rolling motion at the very time when it is desired to stop the mouth of the bottle.

In Fig. 4, a side elevation of the link D, cap-plate *a*, and its head *b* is shown, the cushion *c* being shown in section in said figure. Fig. 5 is a plan view of the locking-plate E.

The device shown in Fig. 11 is the same as that shown in Figs. 1, 2, 3, 4, and 6, with the exception that the link D is round in cross-section, and therefore the lock-plate F, a plan view of which is shown in Fig. 14, can turn thereon. Said plate F is circular, with several notches in its edge, so that any two opposite notches may receive the arms of the yoke, and thereby avoid the necessity of turning the plate before locking the parts.

In Fig. 9 the lock-plate G is hung by a pin to the link D, and its notched ends engage with the arms of the yoke to lock it by swinging into a horizontal position, and out of engagement by swinging into the position indicated in broken lines in said Fig. 9.

Fig. 12 shows a plan view of said lock-plate G.

In Fig. 10, the lock is a flattened ring or loop, H, slipped over the end of the link and yoke, and crowded on with force, so as to create sufficient friction to prevent accidental displacement. A plan view of this lock is shown in Fig. 13.

In Fig. 15, a similar flattened ring or loop, I, is employed for a lock, the same being hung by a pin to one arm of the yoke; and the other arm is so curved as to allow the loop to swing off into the position indicated in broken lines in said Fig. 15. A plan view of this lock I is shown in Fig. 18. All of these various locks and lock-plates I consider the equivalent of the lock-plate E.

Fig. 16 represents the cap-plate *a* and its cushion *c* as attached to the lower end of a jointed link, D′, which might be employed without changing the operation of the locking device.

For narrow-mouthed bottles I prefer the non-jointed link and spherical cushion secured directly thereto; but for wide-mouthed bottles or fruit-jars a jointed link and a flattened or annular cushion may be employed.

In Fig. 17, an adjustment for changing the length of a non-jointed link is shown, in which the cap-plate *a* is provided with a threaded hole, and is screwed on the lower end of the link D″, by which means it can be fitted so that the cushion *c* may, through the medium of the link, be compressed more or less, as may be desired. In order to prevent accidental detachment of the cap-plate, when so adjusted, the lower end of the link has a small spindle passing through the cap-plate and its head, which spindle is headed at the end, so that said cap-plate cannot be screwed down so far as to become detached. In this view, which is a vertical section, the shape of the spherical and truncated cushion as it appears when compressed within the mouth of the bottle is represented.

I propose to form the link of cast malleable metal; and it may be cast with its upper end open, as shown by an enlarged view in Fig. 7, so that it may be slipped upon the yoke after the same is formed, and then closed by bending into the form shown in Fig. 8, which is also an enlarged view.

One essential feature of my invention consists of the positive lock, which engages both the link and yoke, and it is evident that the shape of the cap-plate and cushion may be varied at pleasure without changing this feature of the invention, and, also, that it is immaterial to the lock whether the link D is jointed or otherwise.

In Figs. 19 and 20 a fruit-jar is shown in which the yoke or bail B and lock-plate E are employed; also, a link, cap-plate, and cushion. The lower end of the link D′ is fitted to work in sockets upon the top of the cap-plate *a*′, so that the link and cap-plate are not only jointed, but are also detachable. The cap-plate is forced upon the mouth of the jar by means of the link and bail, and locked in place by the lock-plate E, which engages with both the link and yoke, substantially the same as in the bottle-stopper already described.

I claim as my invention—

1. The jointless link and cap-plate D *a*, in combination with the yoke of a bottle-stopper, substantially as described, and for the purpose specified.

2. The combination of the following four elements, to wit: first, a cap-plate and cushion; second, a link for pressing the cap-plate and cushion into the mouth of the bottle or jar; third, a yoke or bail, attached by a joint at one end to said link and at the other end to the neck of the bottle or jar; and, fourth, an additional device for locking the bail and link by engagement with both of said parts, substantially as described.

3. In a bottle-stopper, or fruit-jar, the yoke B, having the bearing and shoulders for the upper end of the link, the widened portion to

allow the lock-plate to pass between the yoke-arms without engagement, and then a contracted portion for engagement with the ends of the lock-plate, substantially as described, and for the purpose specified.

4. In a bottle-stopper, the combination of the swinging yoke or bail, a swinging link attached by a joint to the upper end of said yoke or bail, a cap-plate and cushion, and an adjustable device for changing the length of the link and cap-plate, so that more or less pressure may be imparted to the cushion through the medium of said link, substantially as described, and for the purpose specified.

HERBERT N. GALE.

Witnesses:

C. E. MITCHELL,

JAMES SHEPARD.