

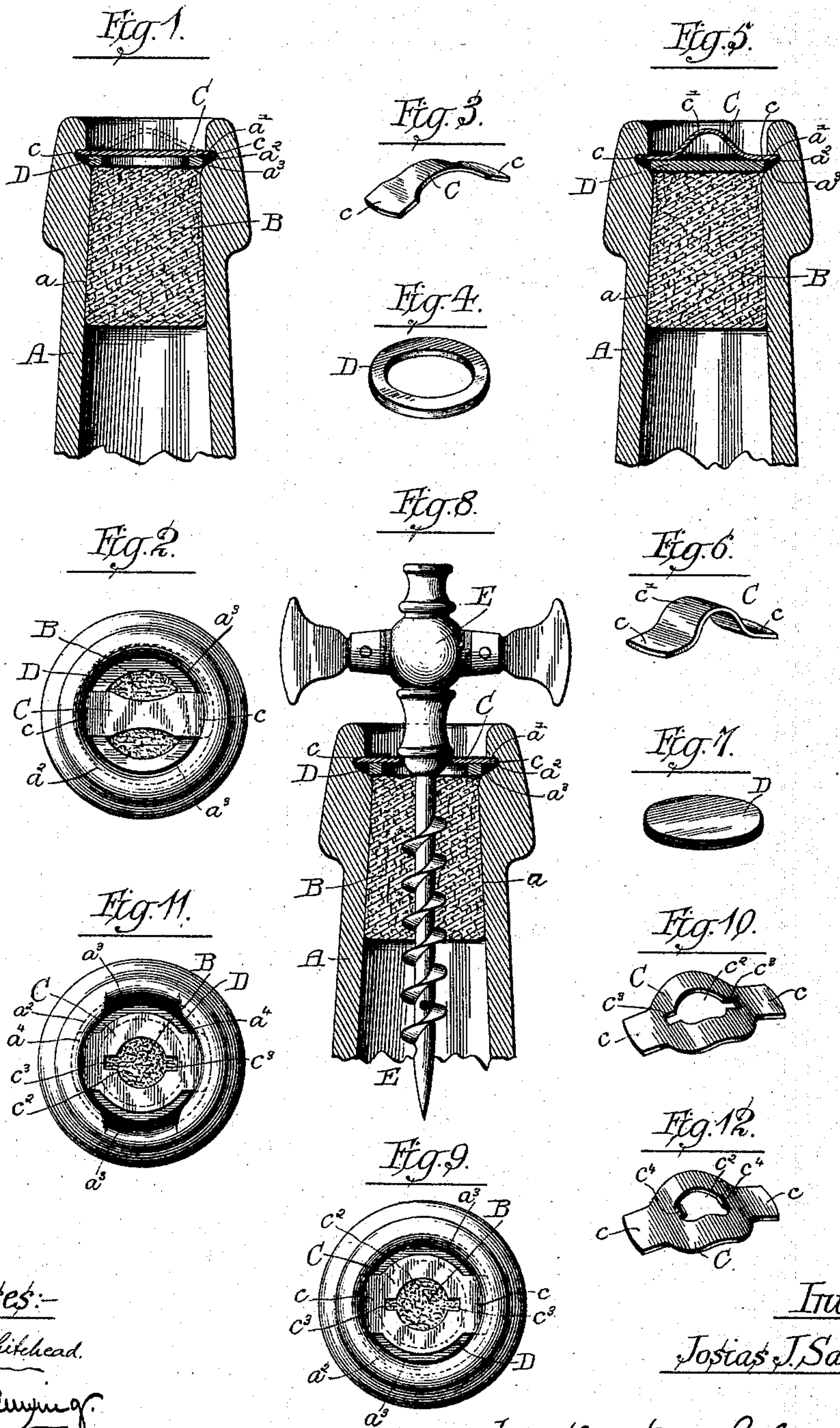
(No Model.)

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RETAINING DEVICE FOR BOTTLE STOPPERS.

No. 413,462.

Patented Oct. 22, 1889.



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RETAINING DEVICE FOR BOTTLE-STOPPERS.

SPECIFICATION forming part of Letters Patent No. 413,462, dated October 22, 1889.

Application filed May 13, 1889. Serial No. 310,605. (No model.)

To all whom it may concern:

Be it known that I, JOSIAS J. SANDS, of Merton, in the county of Waukesha and State of Wisconsin, have invented certain new and useful Improvements in Retaining Devices for Bottle-Stoppers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in devices for retaining stoppers in bottles and other vessels; and it consists, primarily, in a cork or stopper holding bar engaged at its ends with a shoulder or groove in the bottle-neck and adapted for insertion in bent form and to be expanded by partially or fully straightening it into full engagement with the shoulders or groove to insure its retention in place, and in a supporting-plate adapted for insertion beneath the holding-bar and for engagement with a shoulder or prominence within the orifice below the shoulder or groove thereof, so as to sustain the ends of the holding-bar while the same is being expanded by downward or inward pressure thereon.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, which illustrate several forms in which my invention may be embodied, Figure 1 is a sectional view of a bottle-neck having one form of my improved stopper-holding device therein. Fig. 2 is a plan view of the same. Fig. 3 is a perspective view of the holding-bar removed from the bottle-neck. Fig. 4 is a perspective view of a supporting-plate of annular form. Fig. 5 is a sectional view of a bottle-neck having an arched holding-bar therein. Fig. 6 is a perspective view of the arched holding-bar. Fig. 7 is a perspective view of a circular or disk-shaped supporting-plate. Fig. 8 is a sectional view of a bottle-neck containing a holding-bar of annular or ring shape and a supporting-plate of similar shape, a "champagne-tap" being shown as inserted through the cork or stopper. Fig. 9 is a plan view of the bottle-neck and fastening devices shown in

Fig. 8. Fig. 10 is a perspective view of the holding-bar shown in Figs. 8 and 9 when bent preparatory to its insertion. Fig. 11 shows in plan view a bottle-neck having short or segmental shoulders and a ring-shaped holding-bar adapted for rotation to free it from the shoulders. Fig. 12 is a perspective view of a holding-bar differing slightly from that shown in Fig. 11.

The invention is herein shown as applied to the orifice of a bottle-neck; but it may obviously be applied to the orifices of other vessels.

To first describe that form of the invention shown in Figs. 1 to 4, inclusive, A is a bottle-neck, of which a is the orifice to be stopped. Near the top of the orifice is located a shoulder or shoulders a' , which forms the upper wall of an annular groove a^2 , the lower wall a^3 of which is beveled or inclined inwardly and downwardly until it intersects the wall of the orifice. While a continuous or annular shoulder a' is preferable, short opposite shoulders may be employed to engage the ends of the stopper-holding device to be described.

B is the stopper, which is inserted in the bottle-neck with its top somewhat below the groove a^2 .

C is a flexible sheet-metal holding-bar, having flat ends c , adapted to enter the groove a^2 at opposite sides of the bottle-neck. The holding-bar C before insertion is bent at its middle, as shown in Fig. 3, to an extent sufficient to shorten the bar so that it will enter the top of the bottle-neck past the shoulder a' . After insertion the holding-bar is flat, or nearly so, and its ends engage the shoulder a' , as clearly shown in Fig. 1.

D is a supporting-plate, in this instance annular in shape, which is inserted in the bottle-neck beneath the holding-bar. The orifice a is made smaller below than above the groove a^2 , and the supporting-plate D is made of such size in external diameter that it will pass the shoulder a' , and will strike the beveled surface a^3 . The said supporting-plate will therefore rest upon or be supported by said beveled surface when inserted into the bottle-neck, and said plate is made of such diameter and thickness that when so sustained by rest-

ing on the beveled surface its upper surface will be below the shoulder a' a distance equal to or slightly greater than the thickness of the ends of the holding-bar.

5 In inserting the stopper and holding device, the stopper is forced into the orifice until its top is below the groove a^2 . The supporting-plate is then inserted and allowed to rest upon the beveled surface a^3 . The holding-
10 bar, when bent as shown in Fig. 3, is then placed within the bottle-neck with its ends resting on the supporting-plate, and sustained, therefore, opposite the groove a^2 , and said bar is then flattened by pressure applied to its
15 top, so as to expand or lengthen the bar until its ends are fully engaged with the shoulder a' . In a stopper-holder thus made the outward pressure of the cork is transmitted by the supporting-plate D to the end portions of
20 the holding-bar, where the pressure will have no tendency to bend upwardly the bar in the middle, so that a supporting-bar of relatively light or thin material will withstand a large internal pressure.

25 A holding-bar made as above set forth is easily removed to allow the extraction of the cork by inserting the point of a corkscrew or other pointed implement or a hook beneath the center of the bar, and prying or pulling
30 the same upwardly until its ends escape from beneath the shoulders of the bottle-neck.

I next describe the form of the invention shown in Figs. 5 to 7, inclusive. In these figures the holding-bar is shown as made with a
35 central arch, and in this respect is like that shown in a prior patent, No. 404,799, dated June 4, 1889. Said bar C in this instance has flat ends $c c$, for engagement with the groove of the bottle-neck and with a central arch or
40 U-shaped bend c' . A supporting-plate D is provided in this instance, which is circular and imperforate or of disk form, and which is adapted for insertion past the shoulder a' and to engage and rest on the beveled sur-
45 face a^3 in the same manner as before described. Said arched holding-bar is preferably made with its ends downwardly-inclined and contracted sufficiently to enter the bottle-neck past the shoulder a' . After insertion
50 the ends of said holding-bar may be easily engaged with the shoulder a' by pressing downwardly upon the central arch with sufficient force to flatten the same and spread the ends of the bar into engagement with the
55 shoulder.

A holding-bar made as above described may be easily removed prior to extracting the cork by the use of a hooked or pointed implement to pull or pry the center of the arch upwardly,
60 thereby releasing the ends of the bar from the shoulder a' .

The form of holding-bar shown in Figs. 8, 9, and 10 is of especial advantage for some uses, and contains certain features which are
65 in themselves novel. In this instance the bottle-neck is made as before described, and the supporting-plate D is annular, like that

shown in Fig. 1. The holding-bar C is also annular in general shape, or, in other words, is nearly circular, being wider in one direc- 70 tion than another, and is provided with a central aperture c^2 . The said holding-bar is made narrower transversely than the orifice a above the groove a^2 ; but lengthwise it is made of such size that when flat its ends $c c$ 75 will engage the said groove. In the particular construction illustrated the flat ends $c c$, made in the form of radial projections, form a plate which is otherwise circular. The said holding-bar C is bent or arched before inser- 80 tion, as shown in Fig. 10, so as to shorten it sufficiently to allow its said portions $c c$ to pass the shoulder a' in the same manner as before described.

In applying the device the supporting- 85 plate Fig. 4 is inserted over the cork, the bent holding-bar then dropped into the bottle-neck so that its ends rest on the supporting-plate, and pressure is then applied to the central part of the bar to flatten the same and ex- 90 pand its ends into engagement with the groove a^2 . The hole in the holding-bar is made smaller than that in the supporting-plate, so that the inner edge of the holding-bar overlaps that of the supporting-plate, 95 thereby enabling the point of a corkscrew or other implement to be inserted beneath the holding-bar to lift and withdraw the latter.

A main advantage of the annular or centrally-apertured form of holding-bar is that 100 it allows the insertion into the cork of a champagne-tap or valved tube, by which a desired quantity of an effervescing liquid can be drawn from the bottle without allowing the escape of all of the confined gases by which 105 the effervescence is produced. Such an implement is shown at E, Fig. 8, as in place within the cork.

In all the figures of the drawings above referred to the shoulder a' of the bottle-neck 110 has been shown as made annular or continuous. In some instances it may be found convenient to use a stopper-holding device of the character described in connection with short opposite shoulders in the bottle-neck. 115 A construction of this kind is shown in Fig. 11, in which the said shoulders are indicated by $a^4 a^4$. In this instance a holding-bar C, shaped like that shown in Figs. 8, 9, and 10, is shown. 120

A holding-bar made as above described will be preferably inserted in an orifice with short opposite shoulders in the same manner as above set forth, but may be inserted or removed by rotating the bar in or out of en- 125 gagement with the shoulders.

In Fig. 11 the holding-bar is shown as provided with two opposite notches $c^3 c^3$ at the sides of the opening c^2 , which notches may be engaged by a screw-driver, the edge of a 130 coin, or other suitable implement or object for turning the bar until its ends pass from beneath the shoulders. This method of removing the holding-bar and inserting the

same may be used when it is desired to restore the stopper after its removal if there is no implement convenient for inserting the same by expansion in the usual manner.

5 In Fig. 12 is shown a holding-bar adapted for use in an orifice made as shown in Fig. 11, the holding-bar in this case being centrally apertured and having upwardly-bent lugs or prongs c^4 , which may be engaged
10 by any suitable implement for rotating the holding-bar to engage it with or disengage it from the short shoulders of the bottle-neck.

For originally inserting the holding-bar shown in Fig. 12 a tool must be used for applying pressure to elongate or flatten the bar, which has a notch or recess to receive said lugs or prongs.

The stopper-holding device shown in said prior patent, No. 404,799, comprised an arched
20 expansible holding-bar, which is inserted into the bottle-neck over the cork, a plate or washer smaller than the orifice being placed over the cork when necessary to bring the outward pressure of the cork upon the ends
25 of the holding-bar.

In another patent, No. 403,076, dated May 7, 1889, I have shown a similarly-shaped holding-bar adapted to engage the bottle-neck by rotating the bar so as to bring its ends beneath interior segmental shoulders of the bottle-neck.

I have found in practice that it is difficult to expand the holding-bar by downward pressure, (which is the simplest and easiest
35 way to elongate the same,) owing to the absence in that construction of any uniformly located and reliable supporting-surface or rest for the ends of the holding-bar at the time of applying the pressure.

40 In driving corks into the bottles by "machine-corkers," owing to variations in the diameters of the corks and bottle-necks and to variations in the compressibility and elasticity of the corks, and to the bottles being
45 filled more or less full, the corks cannot be driven in such manner as to bring their top surfaces to a uniform distance below the shoulder or groove of the bottle-neck. It follows that in attempting to insert the holding-bars by pressure or by rotation, as described
50 in Patent No. 403,076, the corks will usually be found to be in the wrong position to properly support the ends of the holding-bar. If the top of the cork is too high, the ends of the
55 holding-bar, instead of coming opposite the groove, will rest opposite the shoulder a' , and when inward pressure is applied to expand the bar the central part will be forced down and the ends will be forced against the shoulder and then turned or bent upwardly, and
60 will thus fail to engage the groove. When, on the contrary, the cork is forced too far in the orifice, the ends of the bar under similar circumstances will strike the beveled surface
65 a^3 or the inner surface of the neck below the same, and will be similarly bent up, and thus render the bar useless.

I have avoided the difficulties referred to by the use of the supporting-plate above described, which, by its engagement with the
70 beveled surface a^3 of the orifice, affords a positive support for the ends of the holding-bar, and sustains the same in proper position with relation to the groove. In other words, it supports the ends of the holding-bar directly opposite said groove, or nearly so, so
75 that when downward pressure is applied to the center of the bar the ends thereof will enter the groove horizontally to the full depth of the latter.

In the use of my present invention the plunger of the corking-machine is preferably set to drive all of the corks slightly below the groove of the bottle-neck, allowance being made for the varying elasticity of the corks
80 and other conditions, so that no cork shall rise sufficiently high to prevent the supporting-plate from resting upon the beveled surface a^3 or on the top of the cork if at a proper height when the said plate is dropped into
85 the bottle-neck. As clearly seen in Figs. 1, 5, and 8, the upper wall of the groove a^2 is nearly horizontal, while the beveled lower wall thereof is at an angle of forty-five degrees to sixty degrees to the axis of the bottle.
90 This beveled surface allows the cork to pass freely into the orifice below the groove without tearing or injuring it, as would inevitably occur if the lower wall of the groove were square or horizontal.

I have found in practice that the supporting-plates, when dropped into the orifice, will "center" themselves or take the required horizontal position upon the beveled surface
105 a^3 when pressure is applied to the holding-bar, so that the ends of the holding-bar can be expanded with certainty into the groove without the use of any special manipulation of the supporting-plate or any special care in inserting it.

It is obviously not essential, as far as the main feature of the invention is concerned, that the supporting-plate should be round or annular, as shown, inasmuch as the same general results may be obtained by a plate of
110 other shape, provided it is constructed to engage the reduced part of the vessel-orifice inside of and adjacent to the groove—as, for instance, the supporting-plate may have the form of a straight bar of proper length, as
115 described in a separate application for patent, Serial No. 310,604, filed simultaneously herewith.

I claim as my invention—

1. The combination, with the walls of a vessel-orifice having an internal groove, and which is smaller inside of than outside of the groove, and with a stopper in the orifice, of a flexible metal holding-bar engaged at its ends with said groove, and a supporting-plate separate from the holding-bar and inserted beneath said holding-bar, said plate being larger than that part of the orifice inside of the groove, substantially as described.

2. The combination, with the walls of a vessel-orifice having an internal groove, and which is smaller inside than outside of the groove, and with a stopper in the orifice, of a
5 flexible metal holding-bar engaged at its ends with the groove, and a supporting-plate of annular form separate from the holding-bar and inserted beneath said holding-bar, said
10 plate being larger in diameter than that part of the orifice inside of the groove, substantially as described.

3. The combination, with the walls of a vessel-orifice having an internal groove, and which is smaller inside than outside of the
15 groove, and with a stopper in the orifice, of a

flexible holding-bar engaged at its ends with said groove and having a central aperture, and an annular supporting-plate separate from the holding-bar and inserted beneath said holding-bar, said supporting-plate being
20 larger in diameter than that part of the orifice inside of the groove, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence
25 of two witnesses.

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Witnesses:

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