

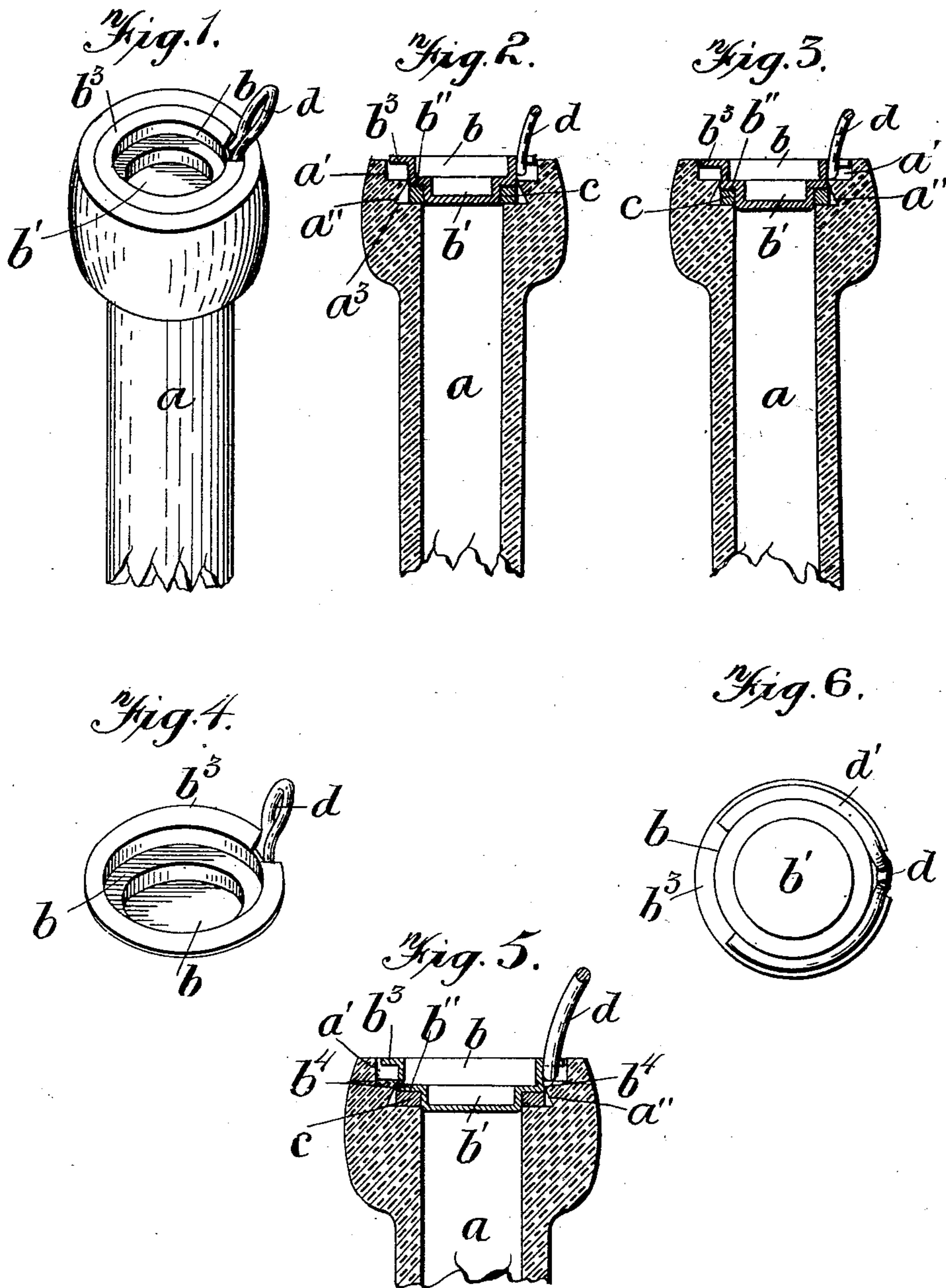
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Patented Dec. 25, 1900.

W. E. HEATH.
BOTTLE SEAL.

(Application filed Jan. 20, 1900.)

(No Model.)



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BOTTLE-SEAL.

SPECIFICATION forming part of Letters Patent No. 664,747, dated December 25, 1900.

Application filed January 20, 1900. Serial No. 2,128. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. HEATH, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Bottle-Seals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in bottle-seals; and the objects and nature of the invention will be clear to those skilled in the art from the following description in the light of the accompanying drawings, illustrating one construction out of a number within the spirit and scope of my invention merely as an example for the purposes of description.

The invention consists in certain novel features of construction and in combinations and in arrangements of parts and details, as more fully and specifically set forth and described hereinafter.

Referring to the accompanying drawings, Figure 1 is a perspective view of the neck of a bottle sealed by mechanism constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view through the bottle neck and seal, showing the plug before being forced in to compress the washer or sealing medium and before the plug has been expanded. Fig. 3 is a view corresponding to the illustration of Fig. 2, showing the plug forced in and the washer compressed and the seal effected. Fig. 4 is a detail perspective, enlarged, of the sealing-plug. Fig. 5 is a detail section, enlarged, corresponding to Fig. 3. Fig. 6 is a bottom plan view, enlarged, of the sealing-plug.

In the drawings, a is the neck portion of a bottle or other vessel or receptacle to which my sealing-plug can be adapted or applied. The top or upper end of said neck is formed with an annular seat or recess a' around its mouth or the open end of its bore or discharge-passage. The floor of this recess preferably forms a flat annular step or shoulder, approximately as shown, although my invention is not so limited. From the inner annular edge of said shoulder, forming the floor

of said recess, the inner surface of the bottle-neck is usually increased downwardly in diameter (see a'') to the inner edge of an annular stop-shoulder a^3 . This stop-shoulder faces upwardly, and the diameter of the interior of the bottle-neck at the inner edge of the said floor of the recess a' is greater than the internal diameter of the bottle-neck or liquid-passage at the inner edge of the stop-shoulder a^3 , so that the plug, as hereinafter set up, can drop into the mouth of the bottle and its washer can freely descend with the plug and rest on said stop-shoulder, between which and the plug the liquid-tight seal is effected. Usually, although not necessarily, the internal diameter of the bottle-neck is not enlarged immediately below or in that portion below and adjacent to said stop-shoulder.

The vertical wall of the top recess or seat is usually, although not necessarily, cylindrical, while the inner surface of the liquid-passage or bottle-neck between the floor of said recess and the annular stop-shoulder is suitably formed with an enlargement. In the specific example shown in the drawings this enlargement is annular and is attained by forming the bottle-neck internally and annularly undercut beneath said floor of the recess and above said shoulder. In other words, the surrounding wall can be tapered from the inner edge of said floor downwardly and outwardly to the surrounding edge of the stop-shoulder, said wall in effect forming a truncated cone and forming the inner edge of said floor abrupt. I do not wish to limit my invention to this particular formation of the bottle-neck just described.

The sealing-plug is preferably hollow and cup-shaped and formed of a suitable thin ductile or pliable metal which will retain its shape when bent or expanded. These plugs are usually stamped out of some suitable thin sheet metal possessing the necessary strength to maintain the seal against accidental release and against the pressure of carbonated liquids, and yet which will permit the easy extraction of the plugs through the medium of the thumb-pieces, as hereinafter set forth. The upper cylindrical portion b of the cup-shaped plug is of an external diameter approximately equal to or slightly less than the

diameter of the liquid-passage at the inner edge of the floor of the said recess a' , and consequently said external diameter of the portion b of the plug is greater than the diameter of the liquid-passage at the inner edge of the stop-shoulder. The lower end b' of the plug is reduced in diameter, so as to fit or freely enter the liquid-passage at the inner edge of the stop-shoulder, and the annular ledge or stop-shoulder b'' intervenes between the lower cylindrical portion b' of the plug and the upper cylindrical portion b thereof. This stop or stop-shoulder b'' is arranged to oppose the stop-shoulder of the bottle-neck and to cooperate therewith in compressing the sealing medium, such as washer c , and thereby forming the liquid-tight joint. In the specific example shown the upper end of the plug is formed with a surrounding flange b^3 , arranged and formed to enter the top recess of the bottle-neck. The plug for the purposes of extraction is provided with a thumb-piece, lever, or projection d , extending from the circumference or edge of the upper end thereof to a point at the exterior of the bottle-neck, where pressure in the proper direction can be applied to said projection to tilt the plug from the bottle. This projection is approximately rigid with the plug, so that in extracting the plug the projection will not tear from the same, and thus defeat or prevent the completion of the extracting operation, but whereby the projection and plug practically move together during the extracting operation and both approximately, in effect, constitute a lever. The projection can be formed in any suitable manner and can be suitably attached to or formed a part of the plug. In the example shown in the drawings the projection is formed by an upward and lateral deflection or loop at an intermediate or central portion of a rod or wire d' , tightly fitting or partially embracing the upper cylindrical portion of the plug beneath the flange b^3 , which retains or aids in retaining the said wire and projection to the plug. The flange is cut away or otherwise formed to permit the upward passage of the thumb-piece or projection, which in the example illustrated projects upwardly through the plane of said flange near the edge of the bottle-mouth and such a distance above the same as to afford the necessary bearing-surface for the thumb in extracting the plug.

The washer c is formed of suitable sealing or packing material—such as cork, pith, or a proper fiber—and is seated against the flat shoulder or ledge b'' of the plug and tightly surrounding the lower cylindrical portion of the plug, so that the plugs can be furnished with the flat washers held thereon by friction. The greatest diameter of the washer should be approximately the same as or less than the external diameter of the upper portion b of the plug, so that when the plug is inserted in the bottle-neck the washer will slip past the inner edge of the floor of the top recess a' and

become seated on the stop-shoulder of the bottle-neck, as shown approximately in Fig. 2, and thus limit the downward movement of the plug, with the top flange of the plug above the top recess of the bottle-neck, as seen in said figure. The lower portion of the upper part b of the plug also slips down beyond said inner edge of the top floor when the necessary downward pressure is applied to the plug to tightly compress and laterally expand the washer, and thereby form and constitute the liquid-tight joint or seal. When this pressure is applied, the top flange of the plug and the wire of the thumb-piece are forced into the top recess of the bottle, usually until the wire engages the floor thereof and the top surface of said flange of the plug is flush with or below the plane of the top edge of the bottle-neck, as shown in Fig. 3. While the plug is thus held down by the pressure of the proper tool a suitable implement expands the lower part of the upper cylindrical portion of the plug, so that the plug is enlarged annularly or at one or more intervals below the inner edge of the floor of the top recess a' of the bottle, as shown at b^4 . This expansion of the plug takes place at a point immediately below the wire of the thumb-piece and above the shoulder b'' of the plug, under which the sealing-washer is located, and the plug is expanded in the specific example shown immediately under the abrupt edge of the floor of the top recess a' , and the plug is thereby held in place with the washer compressed and the liquid-tight joint maintained.

The peculiar sealing disk or plug *per se* without the extractor thumb-piece is not claimed in this case, but forms the subject-matter of my divisional application filed May 12, 1900, Serial No. 16,475. Claims for a lever thumb-piece are broadly made in my companion application filed on even date herewith, Serial No. 2,129. Hence I make no such claims, broadly, in this application.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A bottle provided with a top annular recess in its mouth and an annular sealing-shoulder below the floor of said recess, in combination with a sealing-disk adapted to be expanded and locked in the bottle-mouth and having an annular shoulder opposing said shoulder of the bottle-mouth and a top flange in said annular recess, said disk provided with a rigid upwardly-projecting thumb-piece extending from the portion of the disk in said recess, substantially as described.

2. A bottle having a top annular recess in its mouth and an annular shoulder a distance below the floor of said recess, in combination with a sealing-plug adapted to be expanded in said bottle-mouth and thereby locked therein and having an annular shoulder opposing said shoulder of the bottle-mouth, a sealing medium interposed between said shoulders, and an upwardly-projecting rigid

thumb-piece having attaching means located in said top recess and engaging the upper portion of said disk, substantially as described.

3. A cup-shaped metal sealing-plug formed with an upper cylindrical portion, and a reduced lower cylindrical portion, the upwardly-projecting lever thumb-piece secured to the plug, and a flat packing-washer surrounding the plug at the junction between said two cylindrical portions within, the neck of a bottle formed a distance below its mouth with an upwardly-facing annular shoulder on which the under flat face of said washer is adapted to rest, whereby the upper portion of said plug on being expanded holds the flat washer compressed between the intermediate portion of the plug and said shoulder of the bottle-neck, substantially as described.

4. A bottle having an internal annular sealing-shoulder, and an internal enlargement above said shoulder, in combination with a cup-shaped ductile-metal sealing-plug having an intermediate annular shoulder opposing said shoulder of the bottle, a sealing-washer surrounding the lower portion of the plug and resting against its shoulder and seated on the shoulder of the bottle, the washer compressed between said two shoulders, and the plug radially expanded at an intermediate point in its length and immediately above said washer and into said enlargement in the bottle, and the lever thumb-piece fixed to the plug and projecting to the exterior of the bottle-mouth, substantially as described.

5. A bottle having an internal annular shoulder and a top annular recess, the bottle having an internally-enlarged portion between said shoulder and the floor of said recess, in combination with a cup-shaped ductile-metal sealing-plug having an annular portion opposing said shoulder of the bottle, an annular sealing medium interposed between said shoulder and the plug and compressed between the same, the plug radially expanded above said sealing medium and shoulder into said enlargement, the upper end of the plug having a flange in said recess, and the projecting lever thumb-piece secured under said flange, substantially as described.

6. In combination, a bottle having in its mouth an annular groove and a laterally-extending seat below the groove, a sealing device which consists of a sheet-metal disk with an upturned flange adapted to be expanded

circumferentially within the said annular groove, a lever thumb-piece secured to said flange, the said disk having a projection stamped or drawn therefrom so as to extend below it, and an annular compressible gasket of a diameter greater than that of the interior of the annular seat, said gasket placed around the said projection which serves to hold the two elements of the sealing device together, substantially as described.

7. In combination, a bottle having a groove, in its mouth, and a laterally-extending annular seat below the groove, a sealing device which consists of a sheet-metal disk with an upturned flange and a projection on its under side stamped or drawn from the disk, the projecting lever thumb-piece secured to said flange, and a compressible gasket placed around the said projection, having a diameter which is greater than the inner diameter of the seat, the said gasket being compressed between the disk and seat, and the upturned flange of the disk expanded within said groove in the bottle-mouth, substantially as described.

8. A bottle-sealing device adapted for application to a bottle having a groove in its mouth and an annular enlargement situated near the said groove, substantially as described, which consists of a sheet-metal disk with an upturned flange formed for expansion, a projection formed on its under side by stamping or drawing, and the lever thumb-piece secured to said flange, combined with a joint-forming annular gasket which is placed around the said projection, substantially as described.

9. A bottle-sealing device consisting of a sheet-metal disk having the upturned flange or upper portion, a lever thumb-piece having attaching means embracing said upper portion, the central downwardly-extending projection, the annular seat or shoulder joining said flange and projection, and a sealing-washer surrounding said projection and seated against said shoulder, the disk locked in a bottle-mouth by having said upper portion thereof expanded radially beneath said attaching means, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM E. HEATH.

Witnesses:

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