

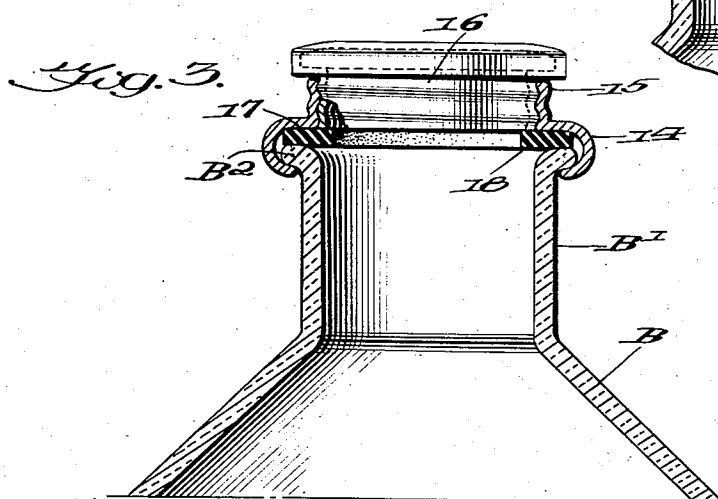
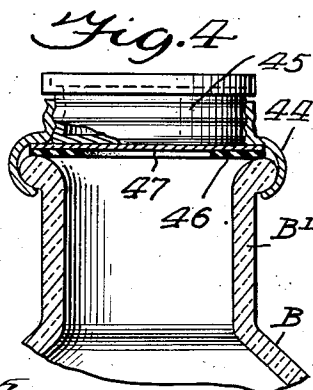
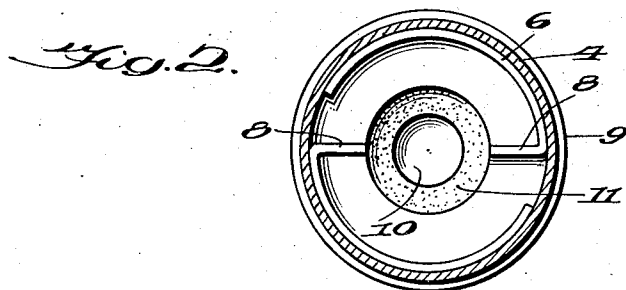
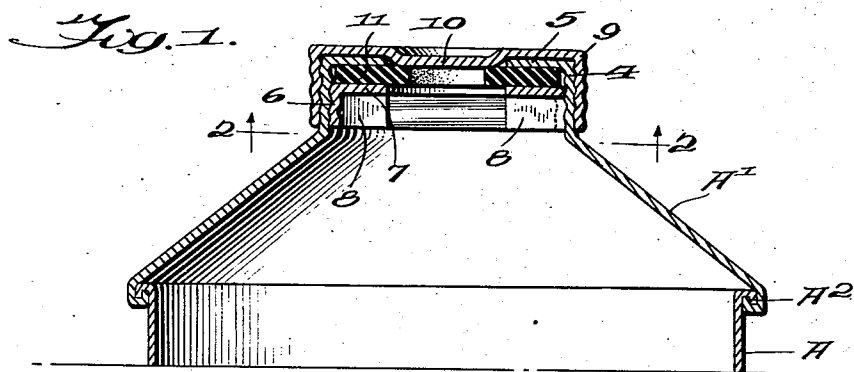
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CLOSURE

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CLOSURE

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8 Claims. (Cl. 220-46)

This invention relates to an improvement in closures, particularly for bottles, cans, or similar containers.

It is frequently desired to use only a portion of canned or bottled goods, particularly fermented or carbonated liquids or beverages under gas pressure, without using the entire contents of the bottle or can. However, no satisfactory closure has been provided heretofore by which only a portion of such fermented liquid or beverage under pressure might be withdrawn and the remainder resealed to retain the pressure with an effective air-tight seal for the contents.

An object of this invention is to improve the effectiveness of the seal of a closure for a container to maintain an air-tight condition of said container either as an original seal or when resealed after opening of the container, by the operation of the cap piece pinching a sealing washer or sealing ring against the neck of the container or a shoulder thereon, so as to produce a check-valve action by the washer or ring, which will utilize the pressure of the fluid acting thereon to maintain the sealing action.

Another object of the invention is to provide for effectively sealing up canned or bottled goods, and in the case of liquids under gas pressure, provision is made by which the pressure acts to maintain the seal of the closure for effectively resealing the can or bottle after a portion of the contents has been withdrawn.

The invention is shown in different embodiments thereof in the accompanying drawing, in which:

Fig. 1 is a vertical sectional view of the top portion of a can, showing one form of this invention applied thereto;

Fig. 2 is a horizontal sectional view there-through on the line 2-2 of Fig. 1;

Fig. 3 is a vertical sectional view showing a slightly modified form of the invention applied to a bottle; and

Fig. 4 is the similar view showing a further modified form thereof.

It will be understood that this invention is adapted to be applied either to a can or to a bottle, and that the different embodiments of the invention shown applied on one or the other is not restricted thereto but may be used on either.

The can structure illustrated in Fig. 1 comprises a body portion A, with a conical top portion A1, joined together by the usual crimped seal A2, or these may be made integral wherever

the closure is capable of being applied and sealed after the complete formation of the can.

The bottle shown in Figs. 3 and 4, is designated generally B, and is shown as having a neck B1, provided with a lip B2, at the upper edge thereof adapted to receive the closure, which lip may be of the character usually employed in connection with a crimped crown cap.

Referring to Figs. 1 and 2 of the drawing, the top portion A1 of the can is shown as provided with a threaded neck 4 attached thereto, such threads being spun or pressed in the sheet metal so as to be in the external and internal surfaces thereof, and the upper edge of the neck 4 has an intumed annular flange 5, provided with a discharge opening therein for dispensing the contents of the can. A ring 6 is screwed into the inner side of the neck 4, having an intumed annular flange 7 at its upper edge extending substantially parallel with the flange 5 and forming a shoulder in the neck 4, said flange 7 having a central opening of approximately the same area and extent as the opening in the flange 5.

Ribs 8 may be formed on the ring 6 by intumed portions thereof to facilitate turning the ring in screwing the same into the neck. A cap 9 of the screw type is provided to extend over and be screwed upon the neck 4 in rigidly secured and adjustable relation thereon, and the cap 9 has a central depressed reentrant portion 10 which extends into the opening in the flange 5 with a crack therebetween.

A sealing ring 11 of cork, rubber, paper, or other suitable soft compressible yielding sealing material is clamped or pinched between the flanges 5 and 7, projecting inwardly beyond the openings therein in position to have the depressed or reentrant portion 10 of the cap 9 press firmly thereagainst and the inner portion of said sealing ring 11 underlies the opening or crack between said depressed portion and the inner edge of the flange 5, so as to seal said opening or crack and be acted upon by any gas pressure within the container in the nature of a check-valve to increase and maintain said seal. In order to get a proper pinching effect on the sealing ring 11, the inner diameter of the flange 7 of said ring is substantially coextensive with the inner diameter of the flange 5, thereby holding the sealing ring in the proper position to underlie the crack between the screw cap 9 and the pouring opening in the can. Thus the under surface of the sealing ring is exposed to any gas pressure in the can and is pressed there-

by over the crack to form an effective seal therefor.

In assembling the closure in this manner, it will be closed and sealed before the can top A1 is joined to the body A of the can, as required by the inner disposition of the ring 6 within the neck of the can top.

In the form shown in Fig. 3, a ring 14 is crimped around the lip B2 of the bottle, or otherwise fastened to the neck thereof, either permanently or removably as desired. This ring 14 may be secured in place in the usual manner of fastening a crimped crown cap. The ring 14 is provided with an upstanding threaded neck portion 15, into which a screw cap 16 is threaded and adjustably secured. The ring 14 has an in-turned shoulder portion 17, joining the same to the neck 15.

A resilient sealing ring 18 is arranged in clamped relation between the shoulder portion 17 and the end of the bottle neck B1, with the inner diameter of the sealing ring 18 less than the outer diameter of the screw cap 16, so as to underlie the joint or crack between the periphery of said screw cap and the adjacent portion of the neck 15. When the screw cap 16 is adjusted into place, it pinches the sealing ring against the shoulder formed by the upper inner portion of the lip B2, to prevent leakage around the ring, setting up a check-valve action thereby, such that the gas pressure in the container will act on the sealing ring to maintain a tight seal thereof over the crack.

The crimping of the ring 14 on the bottle lip B2 clamps the sealing ring 18 therebetween sufficient to prevent the leakage around the sealing ring under pressure, but any suitable means may be provided for securing the closure ring to the container as desired.

In Fig. 4, a construction similar to that shown in Fig. 3 is provided, embodying a main ring 44 receiving a screw cap 45, which is threaded therein, and being provided with a sealing ring 46, clamped between the end of the bottle neck B1, and the main closure ring 44, but being shown somewhat thinner than the sealing ring of Fig. 3. Interposed between the sealing ring 46 and the end of the screw cap 45 is a thin easily broken disc 47, of suitable material which will form an effective seal and yet will break readily when the cap is unscrewed, which disc may be formed of tinfoil, waxed paper, or the like. The disc 47 extends beyond the crack around the screw cap 45, and is clamped with the sealing ring 46 between the end of the bottle neck and the closure ring 44 by the crimping of the closure ring on the bottle.

The center portion of the disc 47 preferably is glued or otherwise secured to the end of the screw cap 45, so that the removal of the screw cap will break out the middle of the disc 47, perforating the same to permit discharge of the liquid in the container. The use of this disc will insure complete sealing of the closure, making it absolutely certain that there can be no leakage until the container is opened. After partial removal of the contents, the screw cap 45 can be screwed back into place, catching the sealing ring 46, substantially as described above will effectively seal the crack around the screw cap with the proper sealing pressure, thus holding the cap against leakage of gas pressure or the liquid contained therein by a check-valve action between said sealing ring and cap.

As illustrated in the drawing, the parts of the

closure are so proportioned that the inner portion of the cap engages and bears against the sealing ring or disc before said cap engages the adjacent portion of the neck or crimped ring, so that the inward screwing of the cap is stopped by the pinching of the sealing ring or disc rather than by engagement of said cap with the neck or crimped ring. This pinching of the sealing ring or disc stops the inward screwing of the cap.

The sealing ring or sealing disc is soft and flexible, but is crimped or pinched sufficiently tight at its periphery so that it functions as a check-valve to seal the container against loss of gas after it has once been opened, while preventing the gas or fluid from passing back of the sealing ring or disc which would thereby interfere with such check-valve action.

I claim:

1. In a receptacle for holding fluids under more than atmospheric pressure, the combination of an openable outlet portion attached to said receptacle, a rigid member securely, adjustably and removably engaged with said outlet portion and at least in part constituting a closure member when closed for preventing the escape of the fluid from the receptacle, said closure member having a leakable crack between itself and said outlet portion with relatively smooth surfaces on opposite sides of said crack, a flexible substantially yieldable annular sealing ring spanning said crack through its entire length and bearing in uninterrupted contact with the surfaces on opposite sides of said crack providing a seal therefor to prevent the escape of fluid under pressure through said crack when said closure member is in closed and engaged position, a shoulder secured in fixed relation to the neck portion underlying the periphery of the ring and the outlet portion surface and cooperating therewith to secure the ring in fixed position, said shoulder being substantially beneath the crack and cooperating with the closure member surface adjacent the crack to pinch the ring therebetween, said sealing ring being in position to be forced by the fluid pressure against the surfaces on both sides of said crack so as to press against said surfaces with pressure in proportion to the internal fluid pressure whereby the greatest internal pressure that the remainder of the receptacle can withstand will be sealed against leakage of the fluid through said crack when the closure member is securely adjusted.

2. The combination with a container having an opening, of a closure structure therefor including a neck portion connected with the container about said opening, said neck portion communicating with said container opening and forming a discharge passage, a removable closure for said passage having an adjustable interlocking connection with the neck portion for positively securing the same on the container, said closure and neck portion forming a peripheral joint therebetween, annular flexible sealing means positioned on the inside of said closure contacting the same and overlapping said joint throughout and sealing the same, and means for fixedly securing said sealing means to the neck portion and container, said securing means including an annular shoulder beneath the sealing means and the peripheral edge of the closure and fixed relative to the neck portion and securing said sealing means to said neck portion, said closure being adjustable to position the inner side thereof adjacent said joint either flush with the upper surface of said sealing means in normal

position or below said normal position whereby said sealing means is pinched between the closure and said shoulder by the adjustable securing of said closure to the neck portion.

3. The combination with a container having an opening of a closure structure therefor including a neck portion attached to the container about said opening, said neck portion communicating with said container opening and forming a discharge passage, a removable closure for said passage having an adjustable interlocking connection with the neck portion for positively securing the same on the container, said closure and neck portion forming a peripheral joint therebetween, a resilient ring positioned on the inside of said closure contacting the same and overlapping said joint throughout and sealing the same, and means for fixedly securing said ring directly to the neck portion and container, said securing means including an annular shoulder beneath the resilient ring and the peripheral edge of the closure and fixed relative to the neck portion and securing said resilient ring to said neck portion, said closure being adjustable to position the inner side thereof adjacent said joint either flush with the upper surface of said ring in normal position or below said normal position, whereby said resilient ring is pinched between the closure and said shoulder by the adjustable securing of said closure to the neck portion.

4. The combination with a container having an opening, of a closure structure therefor including a neck portion attached to the container about said opening, said neck portion communicating with said container opening and forming a discharge passage, a removable closure for said passage having an adjustable rotary clamping connection with the neck portion and having an inner end extending into said discharge opening of the container, said closure and neck portion forming a peripheral joint therebetween, a resilient ring positioned on the inside of said closure contacting the same and overlapping said joint throughout and sealing the same, and means for fixedly securing said sealing ring directly to the neck portion and container, said securing means including an annular shoulder beneath the sealing ring and the peripheral edge of the closure and fixed relative to the neck portion and securing said resilient ring to said neck portion, said closure being adjustable to position the inner side thereof adjacent said joint either flush with the upper surface of said ring in normal position or below said normal position, whereby said ring is pinched between the closure and said shoulder by the securing of said closure to the neck portion.

5. The combination with a container having an opening, of a closure structure therefor including a neck portion attached to the container about said opening, said neck portion communicating with said container opening and forming a discharge passage, a removable closure for said passage having a screw-threaded connection with the container for adjustably and positively securing the same on the container and said closure having an inner end extending into the opening with a crack therebetween, said closure and neck portion forming a peripheral joint therebetween, a resilient ring positioned on the inside of said closure contacting the same and overlapping said joint throughout and sealing the same, and means for fixedly securing said sealing ring directly to the neck portion and container, said securing means including an annular

shoulder beneath the resilient ring and the peripheral edge of the closure and fixed relative to the neck portion and securing said resilient ring to said neck portion, said closure being adjustable to position the inner side thereof adjacent said joint either flush with the upper surface of said ring in normal position or below said normal position, whereby said sealing ring is pinched between the closure and said shoulder by the adjustable securing of said closure to the container, said ring having the portion thereof overlapping the joint between the container and the closure free to flex outward in response to fluid pressure in the container to seal said crack between said portions.

6. The combination with a container having an annular shoulder defining an opening therein, of a closure structure for said opening including a neck portion connected with the container about the opening, said neck portion communicating with said container opening and forming a discharge passage, a removable closure for said passage having an adjustable interlocking connection with the neck portion for positively securing the same on the neck portion movable toward and from said annular shoulder, the transverse cross sectional area of the closure being substantially the same size as the opening defined by said annular shoulder, annular flexible sealing means on the inner side of said closure overlapping uninterruptedly the inner peripheral edge of the annular shoulder and the outer peripheral edge of the inner end of the closure, and means for fixedly securing said sealing means between the neck portion and annular shoulder, said closure being adjustable to position the inner peripheral edge thereof flush with the upper surface of the sealing means in normal position or below said normal position whereby said sealing means is pinched between the closure and said shoulder by the adjustable securing of said closure to the neck portion.

7. A container and closure structure capable of holding carbonated beverage pressures and to be resealed, comprising a neck portion having a passage therethrough and having a peripheral shoulder, removable closure cap means for said passage having a wedgingly adjustable and positive interlocking connection with the neck portion for securing the same thereon positively and movable toward and from the peripheral shoulder, said structure having a substantially annular crack between the closure cap means and the neck portion with relatively smooth surfaces on opposite sides thereof approximately in a common plane, an annular flexible substantially yieldable sealing ring inwardly of said closure cap means and having a relatively smooth surface spanning said crack in uninterrupted overlapping contacting relation with adjacent portions of both smooth surfaces on opposite sides of the crack, said ring having the opening thereof in open communication with the container and being so dimensioned that it is clamped upon said shoulder by the adjustment of the cap means on the neck portion, whereby a seal is provided for said crack to prevent the escape of fluid under pressure from said neck portion when said cap means is adjusted inwardly on the neck portion sufficiently to pinch the sealing ring against the shoulder and start a sealing action over the crack whereby the internal pressure will then increase the effectiveness of the seal against leakage due to normal internal carbonated beverage pressure.

8. A closure structure comprising a neck portion having a passage therethrough and having a rigid peripheral shoulder fixed relative thereto, removable closure means for said passage having an adjustable interlocking connection with the neck portion for positively securing the same on the neck portion and movable toward and from the peripheral shoulder, said closure structure having a crack between said removable closure means and said neck portion, a flexible substantially yieldable annular sealing ring inwardly of said removable closure means spanning said crack and overlapping uninterruptedly adjacent

portions of both the shoulder and the removable closure means, said ring being so dimensioned relative thereto that it is bodily pinched between said shoulder and closure means by the adjustment of the closure means on the neck portion providing a seal for said crack to prevent the escape of fluid under pressure through said crack when said removable closure is in closed position, and means for holding said sealing ring in position for sealing action over said crack by the adjustable connection of the closure means with the neck portion.

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