

June 15, 1937.

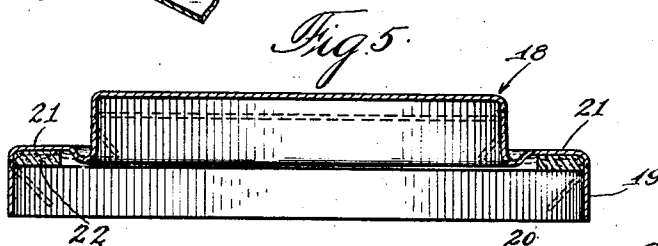
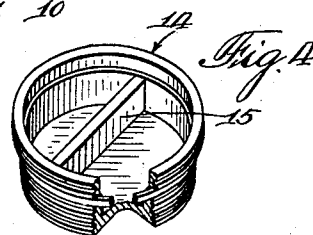
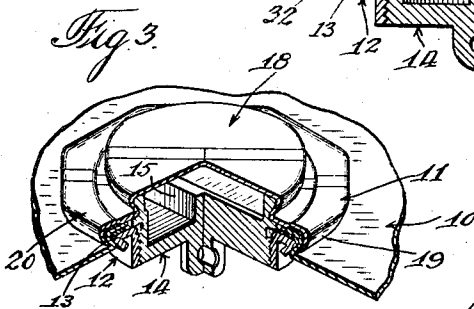
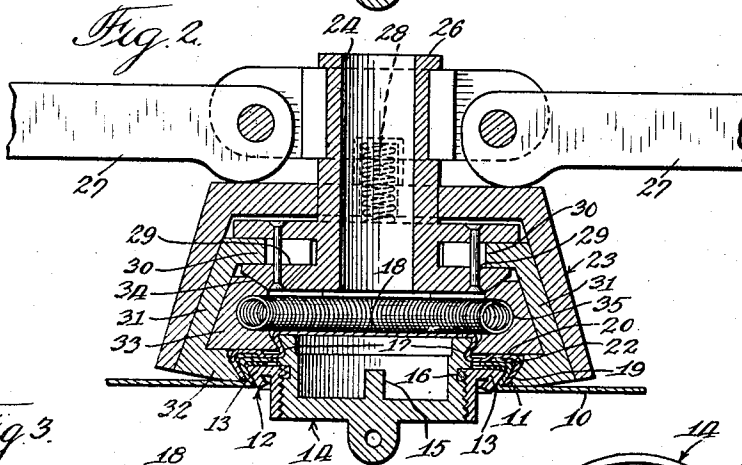
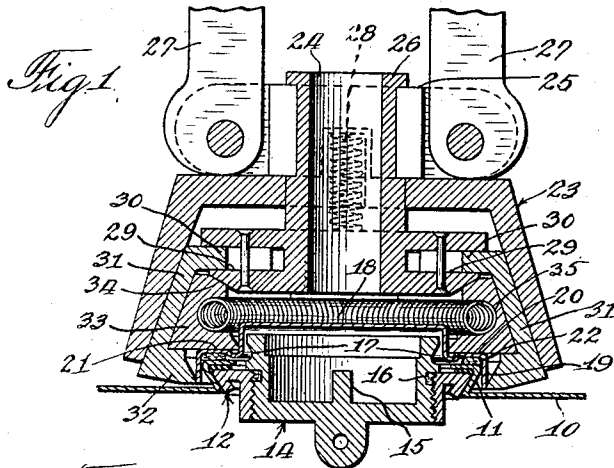
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2,084,007

CONTAINER CLOSURE

Filed Aug. 3, 1935

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 10.

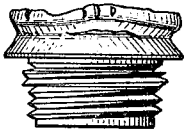


Fig. 6.

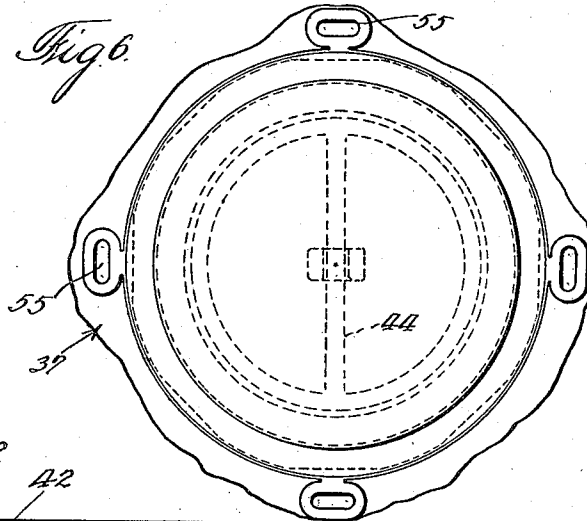


Fig. 7.

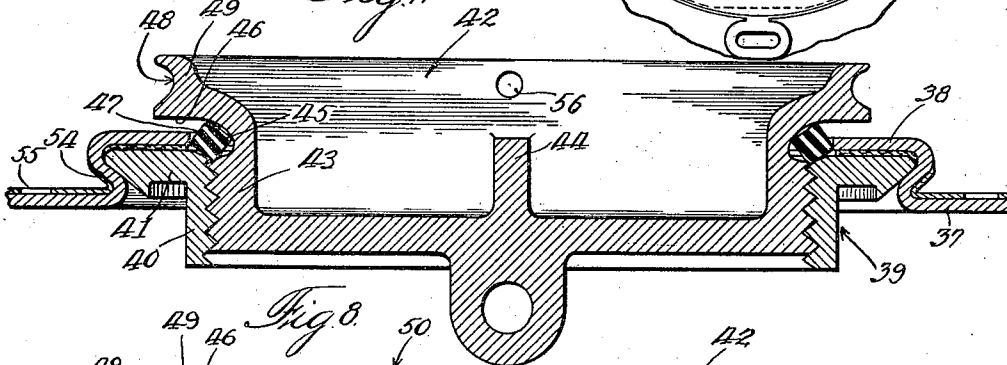


Fig. 8.

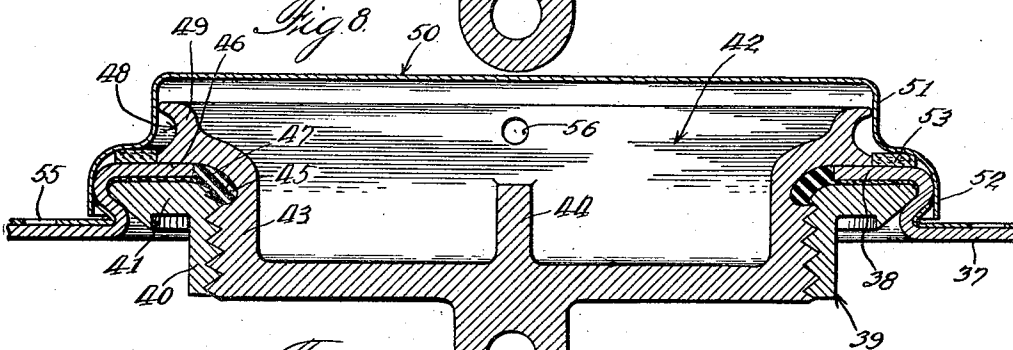
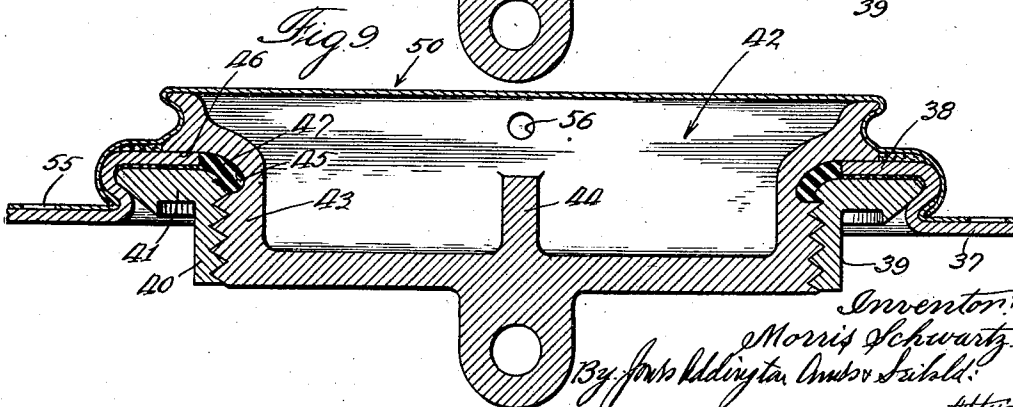


Fig. 9.



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UNITED STATES PATENT OFFICE

2,084,007

CONTAINER CLOSURE

Morris Schwartz, Chicago, Ill., assignor to Barrel Fitting & Seal Corporation of America, Chicago, Ill., a corporation of Illinois

Application August 3, 1935, Serial No. 34,595

6 Claims. (Cl. 220—39)

This invention relates to a container closure and has special reference to a closure for sealing and for preventing undetectable access to a container such as is employed for storing and shipping liquids and semi-liquids.

More particularly, this invention relates to a container closure comprising a bung having a portion thereof for engagement with a connecting means in a hole in a supporting wall of the container for sealing the hole and another portion extending beyond the plane of an outwardly formed body portion of the container wall enclosing the connecting means, a hood being provided for enveloping the extending portion of the bung and the outwardly formed body portion of the container wall. It is preferable that the hood forcibly engage both a peripheral groove on the extending portion and the side walls of the outwardly formed body portion.

The type of plug contemplated herein is similar to that shown in the patent to Henry Schwartz, No. 1,338,042, issued December 22, 1931, whereby a sealing of the connecting means in a hole in the supporting wall of a container takes place in the threads of the connecting means, a rubber, lead or other soft, pliable gasket being forced into the threads of the connecting means when the closure or bung is threaded thereon, to effect a fluid-tight seal. This seal is effective so far as concerns the actual opening in the bushing provided in the container. However, it is desirable also to effect a positive seal between the socket or outwardly formed body portion of the container wall and the outside walls of the threaded connecting means. Usually, a gasket is inserted between the socket and the connecting means although the present invention provides a seal on the top of the barrel wall to augment the action of the above-recited gasket so that a positive seal is had.

It is also desirable to prevent access to the bung or plug in order to guard against an unauthorized opening of the barrel or container without such opening being detected. Applicant contemplates the provision preferably of a tin plate which is scored for removal but may not be removed unless totally destroyed. The material of the hood formed from the tin plate, preferably of .015" thickness, is displaced at two portions thereof, one portion of the hood being forcibly engaged with the plug and the other portion of the hood preferably being forcibly engaged with the outwardly formed body portion of the container. The material of the hood, being crimped at two portions, is prevented from

springing outwardly at intermediate points so that a gasket disposed between the hood and the container wall is maintained in a compressed condition.

The hood preferably is formed of a stepped cross section; that is, the hood has a body portion of reduced diameter and a skirt portion of an enlarged diameter. The body portion of reduced diameter preferably is circular for engaging the circular plug, and the skirt portion preferably is initially circular but thereafter formed polygonally for snugly engaging the polygonal contour of the socket, the socket housing the connecting means. The hood thus prevents a rotation of the plug without detection by reason of the polygonal contour of the engaging surfaces of the socket of the barrel wall and the skirt of the hood, a relative movement therebetween fracturing or at least distorting the material of the hood.

As a further means for preventing undetectable access to the contents of the barrel, a portion of the bung extending outside of the socket is provided with a peripheral weakened portion which, upon the application of a wrench or other similar tool to unscrew the bung, will become fractured or distorted to such an extent as to prevent a rotation of the bung, or, at least, to such an extent as to prevent undetectable access to the contents of the barrel.

As has been pointed out hereinbefore, a portion of the body portion of the hood preferably engages a peripheral groove on the extending portion of the plug. In order to contract the neck of the hood to fit in a peripheral groove so that a uniform thickness of the hood is maintained throughout and further to prevent fracturing of the material thereof, a surplus of material may be provided in the hood portion which may be displaced into the groove without stretching the material of the hood and without drawing any material from the thickness thereof.

One of the objects of the invention is to provide a closure for sealing and preventing undetectable access to an opening in a container of the type noted above, in which the material of the hood is crimped at two points to prevent undetectable removal and to prevent spring at an intermediate point in order to maintain compression on a gasket thereat.

Another object of this invention is to provide a closure of the type hereinabove described, in which a gasket thereof seats on the barrel stock so that the hood will have the further advantage

of providing a positive seal as well as to prevent undetectable access to the container.

A further object of this invention is to provide a closure of the character noted above in which an extension thereof is weakened at a peripheral portion in order that a fracture or distortion of the material may occur upon the application of a tool thereto.

A still further object of this invention is to provide a closure of the type above indicated in which the flange of the plug may seat on the barrel stock.

Other objects and advantages will hereinafter be more particularly pointed out, and for a more complete understanding of the characteristic features of this invention reference may now be had to the following description when taken together with the accompanying drawings, in which latter:

Figure 1 is a central vertical sectional view of a container closure embodying the features of this invention, the closure being shown in an initial position on the connecting means of a container and a forming tool being ready for the application of pressure thereto;

Fig. 2 is a view similar to Fig. 1, showing a changed position of the operative and operated parts;

Fig. 3 is a fragmentary perspective view, partially in section, of the closure construction as applied to a container;

Fig. 4 is a perspective view, partially in section, of the plug for use in the closure construction;

Fig. 5 is a central vertical sectional view of the hood of the above figures in an initial state and before assembly thereof in the closure construction;

Fig. 6 is a top plan view of a fragmentary portion of a barrel head with a closure construction of modified form installed therein;

Fig. 7 is a central vertical sectional view of the form of Fig. 5, showing an initial position of the plug in the connecting means for the opening of the container wall;

Fig. 8 is a view similar to Fig. 6, showing the plug in a seated position and showing the hood in an initial position;

Fig. 9 is a view similar to Fig. 7 showing the completed closure assembly in a sealed condition; and

Fig. 10 is a side elevational view of a plug on which an attempt has been made with a tool to remove from the container.

Referring now to the drawings, and more particularly to Figs. 1 to 5, inclusive, thereof, the device of this invention is associated with a barrel head 10 or supporting wall of a container preferably formed of sheet material, such as steel. A flanged portion is preferably integrally formed with the head 10 and projects outwardly from the barrel or container to form a socket 11.

The side walls of the socket 11 are preferably polygonally shaped and receive therein a connecting means 12 comprising an annular ring having a flange at one end thereof extending outwardly therefrom, the peripheral contour of the flange being polygonal and conforming to the polygonal contour of the socket 11. Although it is preferable to provide a polygonally shaped socket in which to contain the connecting means, it is to be understood that any non-circular shape may preferably be employed so that the connecting means is prevented from turning in the socket. The connecting means may be made of an inter-

nally threaded casting or formed from a sheet metal stamping.

In the particular construction herein shown, the peripheral edges of the flange 13 extending from the collar 12 are tapered, the tapers converging rearwardly or inwardly from the outer surface thereof toward the interior of the container, and the side walls of the socket 11 are formed to engage snugly the tapered edges to secure the connecting means in a fixed assembled relation with the barrel head. It is preferable to dispose a gasket between the socket and the flange of the connecting means for the purpose of sealing the space therebetween.

A plug or bung 14 of substantially cup-shaped form is provided with external threads over the lower portion thereof to threadedly engage the connecting means 12. Interiorly of the cup-shaped bung, a tool-engaging formation 15 is provided, the formation comprising preferably a bar extending diametrically of the plug and serving to reinforce the construction thereof. The plug 14 is cast or otherwise provided with a peripheral groove 16 adjacent the externally-threaded portions thereof, the groove being of greater depth than the threads and providing a shoulder at each edge thereof to retain a sealing means, such as a rubber or lead gasket or other soft flexible or pliable material, in position.

The sealing device thus shown provides an effective seal for preventing leakage of liquid or semi-liquid through the hole of the container by reason particularly of the seal being afforded in the material of the threads themselves.

A portion of the plug or bung 14 extends above the connecting means and likewise above the plane of the outwardly-extending body portion of the container. This outwardly-extending portion is preferably provided with a peripheral groove 17, which groove may be continuous or interrupted, as desired.

In order to prevent undetectable access and to seal the closure construction, a hood 18 is provided and comprises an inverted, substantially cup-shaped member of stepped cross section; that is, the upper portion thereof is of reduced diameter compared with the enlarged diameter over the lower or skirt portion thereof. The hood portion of reduced diameter is adapted to envelop the extending portion of the plug 14, and the skirt portion 19 or enlarged portion of the hood is adapted to envelop the outwardly-formed body portion of the container. The skirt portion is connected to the reduced portion of the hood by the laterally-extending portion 20 which is initially provided with a surplus of material, as at 21 (referring to Fig. 1 of the drawings) preferably adjacent the vertically-extending wall of the reduced portion of the hood.

A washer 22 is provided interiorly of the hood, adjacent the laterally-extending portion 20, and is preferably of a compressible gasket material of cork or any usual type and further is preferably cemented or glued in place therein. The diameter of the hood at the polygonal skirt portion is slightly larger than the diameter of the body portion for convenience of assembly and for accommodating variations in the barrel stock. Likewise, the diameter of the hood at the reduced top portion is slightly larger than the outside diameter of the plug over which it fits.

In order to assemble the hood 18 on the plug and the body portion of the container, a tool may be provided, such for example as that which is

illustrated and described more particularly in my copending application Serial No. 740,142, filed August 16, 1934, of which this application is a division and a continuation in part. For purposes of illustration, this tool is shown as comprising an inverted, substantially cup-shaped member 23 having converging sides when viewed in cross section. A post 24 is journaled in a hole in the closed end of the cup-shaped member for relative longitudinal movement therein. A split collar 25 is mounted on the upper end of the post 24 and is held against displacement in one direction by the flange 26 and in the other direction by the member 23. The collar 25 is provided with diametrically disposed forked extensions for pivotally supporting hand levers 27, the hand levers being provided with cam surfaces for engaging the upper end of the cup-shaped member 23. A movement of the levers 27 downwardly from a vertical position provides relative movement between the post 24 and the cup-shaped member 23, a compression spring 28 assisting the return of the members to an initial position upon release of pressure from the levers 27.

The lower end of the post 24 is provided with radially-extending forked members providing recesses 29, into which flanges 30 of the crimping jaws 31 slidably extend. The longitudinally-extending portions of the crimping jaws 31 are preferably of uniform thickness, the outer and inner walls thereof converging in the same direction and the outer walls engaging the converging sides of the cup-shaped member 23. The lower ends of the crimping jaws 31 are provided with laterally-extending portions 32 having skirt-engaging faces inclined with respect to the vertical to the degree of taper of the converging walls of the socket 11.

I have hereinbefore recited that the post 24 has relative longitudinal movement with the substantially cup-shaped member 23. Such movement provides the crimping jaws 31 with lateral movement in a single plane by reason of the engagement of the flanges 30 of the crimping jaws 31 in the space 29 between the forks of post 24, the converging sides of the substantially cup-shaped member 23 acting upon the similarly converging sides of the crimping jaws 31. The skirt-engaging faces, the combined contours of which preferably form a polygon, move the skirt 19 of the hood into snug engagement with the side walls of the socket 11.

A second set of crimping jaws 33 are provided interiorly of the jaws 31 and are positioned thereby, the outer walls of the crimping jaws converging in the same direction as the inner walls of the crimping jaws 31, so that actuation of the crimping jaws 31 laterally will likewise produce a lateral movement of the crimping jaws 33. However, the crimping jaws 33 not only have a lateral movement radially of the tool but also a longitudinal movement thereof which is provided by means of the tapered engaging surfaces, indicated at 34, of the post and the crimping jaws 33. Thus, a lateral movement of the jaw members 33 likewise produces a longitudinal movement thereof.

The longitudinal movement of the crimping jaws 33 urges the laterally-extending portion 20 of the hood toward the outer face of the socket 11 and compresses the sealing gasket therebetween. At the same time, the lateral movement of the crimping jaws 33 moves the initial vertically-extending side walls and the reduced portion

thereof into the groove 17, thus substantially using up the surplus material indicated at 21. It will be noted that the pointed wall engaging portion of the crimping jaw 33 engages at a point above the juncture of the wall with the horizontally extending portion 20 thereof to prevent fracturing of the material of the hood and to permit ease of working. The closure construction resulting from this operation is shown clearly in Fig. 2 of the drawings, these movements being augmented preferably by a movement of the skirt 19, preferably snugly against the converging side walls of the outwardly-extending body portion of the container.

The operating handles 27 provide the relative movement between the cup-shaped member 23 and the post 24 when the hand levers are depressed from the position shown in Fig. 1 to the position shown in Fig. 2 wherein the link members 28 are extended. This extended condition of the links 28 moves the cup-shaped member downwardly relatively to the container and produces a lateral movement of both sets of crimping jaws and also a further longitudinal movement of one set thereof. When the handles are moved in an upward direction, the cup-shaped member 23 is withdrawn and a spring 35 tends to spread the jaws back into the initial position shown in Fig. 1.

The hood above described prevents any undetectable access to the contents of the container and is crimped at two portions over the barrel stock and the plug for sealing the barrel opening. Being so crimped, the material of the hood is prevented from springing at intermediate portions between the crimped portions so that a compression on the gasket 22 is maintained. The engagement of the hood on both the plug and the barrel portion is forced, and the hood can only be removed by totally destroying the same, as by means of inserting a screw driver or other sharp pointed instrument at the cross score line indicated by the numeral 36 in Fig. 5, the score line intersecting pairs of diametrically-extending score marks for convenience in removing.

Referring now more particularly to Figs. 6 to 10, inclusive, a modified form of closure construction illustrating the present invention is shown and is associated with a barrel head 10 for a supporting wall of a container which is preferably formed of sheet material. A portion of the material of the barrel head surrounding an aperture cut therein is preferably formed outwardly into a socket 38.

The side walls of the socket 38 are preferably polygonally shaped for receiving therein a connecting means 39 which, in the present instance, comprises an annular upstanding ring 40 having an outwardly extending flange 41, the peripheral contour of the flange being polygonal and conforming generally to the polygonal contour of the socket 38. The socket and peripheral contour of the flange of the connecting means are preferably of polygonal contour to prevent relative rotation or movement therebetween. The connecting means may be made of a cast material or formed of a sheet metal stamping as desired.

In the particular construction herein shown, the peripheral edges of the flange 41 are tapered, the tapers converging rearwardly or inwardly from the outer surface thereof toward the interior of the container. The tapers are formed in this particular instance by displacing the material of the flange to present a somewhat elongated contacting surface for the side walls of the socket 38, which latter are formed in-

wardly to engage snugly the tapered edges so as to secure the connecting means in a fixed assembled relation with the barrel head. It is preferable, although not actually essential in the particular construction herein contemplated, to dispose a gasket between the socket 38 and the flange 41 for the purpose of sealing the adjacent metallic surfaces thereof.

A plug or bung 42 of substantially cup-shaped form is provided with threads over a portion of the upstanding external walls 43 to threadedly engage the internally formed threads of the connecting means 39. Interiorly of the cup-shaped bung 42, a tool engaging formation 44 is provided, the formation comprising preferably a bar extending diametrically above and serving to reinforce the construction thereof. The upstanding wall 43 of the bung 42 is provided with a peripheral groove 45 adjacent to and above the external threads thereof, the groove being of greater depth than the threads and preferably merging with a shoulder 46 on the underside of an enlarged head portion of the bung. The groove 45 is adapted to retain a sealing means such as a rubber or lead gasket or other soft flexible or pliable material in position to seal the engaging threads of the bung and the connecting means, and also to provide a seal at the juncture of the connecting means and the socket. The sealing means employed in the present embodiment may preferably be formed of an annular rubber member 47 of square cross section, the latter being more practical from a commercial standpoint, and the member is initially disposed in the groove and assumes a position somewhat as shown in Fig. 7.

As the plug is screwed home into the connecting means, the flexible or pliable material of the sealing means 47 is compressed and is distorted to fill the entire space between the shoulder 46, the end of the inner peripheral edge of the socket and the top of the threads of the connecting means and plug. The sealing means thus provides an effective seal for preventing leakage of liquid or semi-liquid through the hole of the container by sealing the threads of the connecting means and plug and also by sealing the engaging edges of the connecting means and the socket, so that a single member such as the rubber band 47 has a dual sealing function.

The enlarged head portion of the plug or bung 42, which extends above the connecting means and likewise above the plane of the outwardly extending socket 38, is preferably provided with a peripheral groove 48, which groove may be continuous or interrupted as desired. The groove is of such a width as to provide a rather sharp edge adjacent the shoulder 46 and likewise adjacent the upper edge of the plug. The thickness of the enlarged head portion at the groove, as indicated by the numeral 49, is comparatively narrow to provide a weakened portion which, as will hereinafter be more apparent, upon the application of a wrench or other similar tool to unscrew the bung without resorting to the normal tool-engaging member 44, will become fractured or distorted to such an extent as to prevent rotation of the bung or at least to such an extent as to prevent undetectable access to the contents of the barrel.

Referring more particularly to Fig. 8, a hood 50 is shown in an initial state before assembly thereof in the closure construction. It will be noted that the hood comprises an inverted substantially cup-shaped member of stepped cross sec-

tion; that is, the upper portion thereof is of a reduced diameter 51 compared with the enlarged diameter over the lower or skirt portion 52 thereof. The hood portion of the reduced diameter is adapted to envelop the extending enlarged head portion of the plug 42, and the skirt portion 52 of the hood is adapted to envelop the socket portion 38 of the barrel head. The hood portion 51 is of substantial height to provide a surplus of material such that the vertically extending wall thereof may be displaced to engage the groove 48 in the manner which will now be described.

A washer 53 is disposed in the hood to rest against the shoulder provided at the juncture between the reduced and enlarged portions and is preferably of compressible gasket material of cork or other usual type and is preferably cemented or glued in place therein. The hood 50 is assembled in the closure construction in the same manner previously described with reference to Figs. 1 to 5, inclusive, by a tool such, for example, as that which is illustrated and described in my copending application above referred to.

The hood 50 prevents undetectable access to the contents of the container, the reduced portion 51 of the hood being crimped into the groove 48 and the skirt 52 being formed over the inwardly converging side walls of the socket. Being so crimped and formed, the material of the hood is prevented from springing at intermediate portions so that the compression on the gasket 53, as shown more particularly in Fig. 9, is maintained. The engagement of the hood 50 on both the plug and the barrel portion is preferably so forced that the hood can only be removed by destroying the same.

Should, for example, a wrench be employed at the enlarged head of the plug in an attempt to rotate the plug to invert the same, a substantial pressure must be supplied to the wrench which would result in the distortion of the material of the lip at the undercut or weakened portion 49 adjacent the peripheral groove 48. The material of the plug or bung is preferably what is known as a No. 2 die cast material composed of approximately 90% zinc with aluminum, copper and magnesium completing the alloy. The resultant material is comparatively soft but relatively tough. The thin material of the hood could either be cut by the comparatively sharp edge of the lip should the plug be cast or formed of a comparatively rigid material, or, if the pressure is sufficient to grip the enlarged head portion at the peripheral edge and the material is relatively soft, the lip would fracture or become displaced in somewhat the manner shown in Fig. 10 which represents an actual plug on which such a test was performed.

A modified form of sealing member for the plug to prevent undetectable access to the contents of the barrel is also illustrated in the present figures, an upstanding collar 54 being held in position about and by the converging side walls of the socket 38. The collar has a plurality of apertured ears 55 extending laterally thereof in a spaced relation for receiving a seal wire which latter may pass through an aperture 56 of the plug. It is, of course, not necessary to employ this sealing means in conjunction with the hood, but upon reuse of the container, it may be used in lieu of the hood.

While I have herein shown and described but two specific embodiments of the invention as

applied to two specific types of container closures, it is to be understood that the details of construction may be varied within wide limits without departing from the spirit of the invention and that the invention is to be limited only within the terms of the appended claims.

I claim:

1. The combination with a container having an outwardly formed body portion adjacent a hole in a supporting wall thereof, of a closure comprising a bung having a body portion engaging and sealing said hole and a flange extending radially outwardly from said body portion to provide a shoulder for seating on said outwardly formed body portion of the supporting wall, said flange having a peripheral groove extending a major portion of the width of said flange, and a hood having a depending portion for forced engagement with said groove and extending therebelow for enveloping said extending portion of said supporting wall whereby an application of pressure thereabove will distort the material of said flange above said groove to prevent undetectable access to the contents of said container.

2. The combination with a container having an outwardly formed body portion adjacent a hole in a supporting wall thereof, of a closure comprising a bung having a body portion engaging and sealing said hole and a flange extending radially outwardly from said body portion to provide a shoulder for seating on said outwardly formed body portion of the supporting wall, said flange having a peripheral groove and being undercut at the rear of said groove to form a peripheral lip of relatively small cross-section, and a hood having a depending portion for forced engagement with said groove and extending therebelow for enveloping said extending portion of said supporting wall whereby an application of pressure thereabove will distort the material of said lip to prevent undetectable access to the contents of said container.

3. The combination with a container having an outwardly formed body portion adjacent a hole in a supporting wall thereof, of a closure comprising a bung having a body portion engaging and sealing said hole and a flange extending radially outwardly from said body portion to provide a shoulder for seating on said outwardly formed body portion of the supporting wall, said flange having a peripheral groove and being of a diameter substantially less than the diameter of the outwardly extending body portion, and a hood of stepped cross-section providing a portion of reduced diameter for forced engagement with said groove and an enlarged skirt portion extending therebelow for enveloping said extending portion of said supporting wall to prevent undetectable access to the contents of said container.

4. The combination with a container having an outwardly formed body portion having inwardly converging edges when viewed in cross-section

and being formed adjacent a hole in a supporting wall thereof, of a closure comprising a bung having a body portion engaging and sealing said hole and a flange extending radially outwardly from said body portion to provide a shoulder for seating on said outwardly formed body portion of the supporting wall, said flange having a peripheral groove and being of a diameter substantially less than the diameter of the outwardly extending body portion, and a hood of stepped cross-section providing a portion of reduced diameter for forced engagement with said groove and an enlarged skirt portion extending therebelow for enveloping and snugly engaging the inwardly converging edges of said extending portion of said supporting wall to prevent undetectable access to the contents of said container.

5. The combination with a container having an outwardly formed body portion having inwardly converging edges when viewed in cross-section and being formed adjacent a hole in a supporting wall thereof, of a closure comprising a bung having a body portion engaging and sealing said hole and a flange extending radially outwardly from said body portion to provide a shoulder for seating on said outwardly formed body portion of the supporting wall, said flange having a peripheral groove and being of a diameter substantially less than the diameter of the outwardly extending body portion, a hood of stepped cross-section providing a portion of reduced diameter for forced engagement with said groove and an enlarged skirt portion extending therebelow for enveloping and engaging the inwardly converging edges of said extending portion of said supporting wall to prevent undetectable access to the contents of said container, and compressible sealing means between said hood and the top of said outwardly extending portion of the supporting wall held in a compressed condition by the engagement of the hood and said groove and said converging edges.

6. The combination with a container having an outwardly formed body portion adjacent a hole in a supporting wall thereof, of a closure comprising a bung having a body portion engaging and sealing said hole and a flange extending radially outwardly from said body portion to provide a shoulder for seating on said outwardly formed body portion of the supporting wall, said flange having a peripheral groove and being of a diameter substantially less than the diameter of the outwardly extending body portion, and a hood of stepped cross-section providing a portion of reduced diameter for forced engagement with said groove and an enlarged skirt portion extending immediately outwardly from the bottom of said groove and then downwardly for enveloping said extending portion of said supporting wall to prevent undetectable access to the contents of said container.

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