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H. VAN ARSDALE

1,891,031

CLOSURE FOR CONTAINERS AND RECEPTACLES

Filed March 9, 1932

Fig. 1.

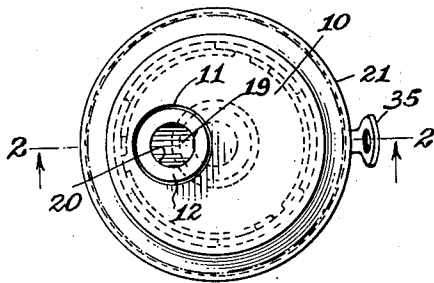


Fig. 5.

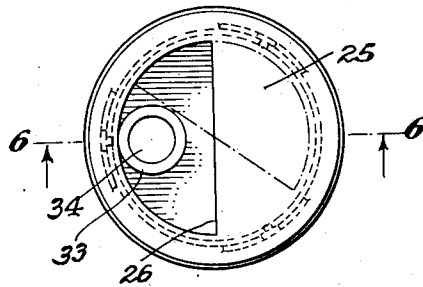


Fig. 2.

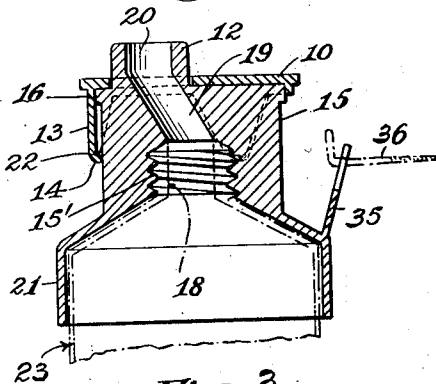


Fig. 6.

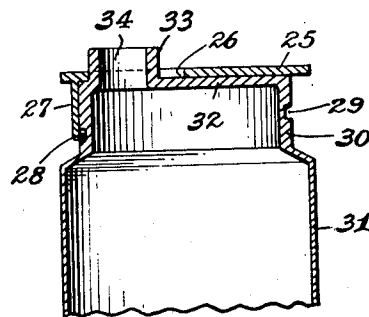


Fig. 3.

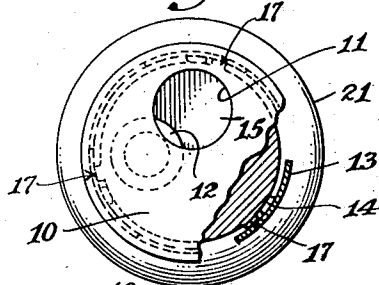


Fig. 4.

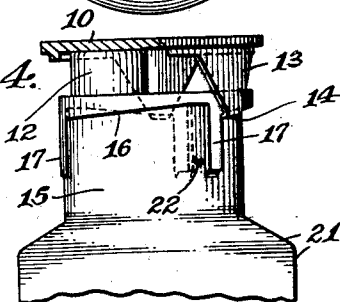
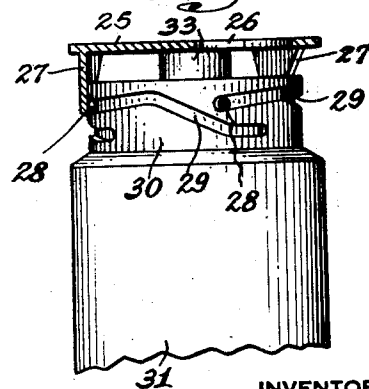


Fig. 7.



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CLOSURE FOR CONTAINERS AND RECEPTACLES

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This invention relates to closures for containers and receptacles, for instance, bottles, tubes, either collapsible or otherwise, etc., and the principal object of this invention is to provide a thoroughly practical, efficient and simple closure having a captive cap which may be quickly, easily and conveniently manipulated to open or to close the container; and to provide a captive cap closure which will close the container securely and effectively, and, when the container is open, allows the contents to be dispensed freely and easily without inconvenience or obstruction, and preferably through a projecting nozzle, and allowing such nozzle to be full size and to have an ample orifice.

A further object of this invention is to provide a practical closure of the character referred to, and one which may be made conveniently and economically as an integral part of the container or receptacle or, if desired, may be made conveniently and economically and sold at low cost, as a separate closure device attachable to containers and receptacles of standard construction or otherwise, and, if desired, permitting detachment thereof for transfer to and reuse on other containers or receptacles.

A further object of this invention is to provide closures of the character referred to and which may be made of the same materials now customarily used for containers and receptacles, for instance, the white metal used for collapsible tubes, without materially or objectionably increasing the cost of manufacture; the closures, however, being also adapted to be made of any one of a number of many different kinds of materials, either inexpensively or otherwise, as desired, either the same as or different from the materials of the containers or receptacles to which they are or may be applied.

Other objects of this invention will be in part obvious and in part pointed out hereinafter.

In accordance with this invention, the closure, either as a separate attachable device or as an integral part of a container or receptacle, is characterized by a cap provided with a closing portion and an aperture and mount-

ed so as to be rotatable and longitudinally shiftable with respect to a projecting nozzle through which the contents of the container or receptacle are dispensed, so that the nozzle may be protruded outwardly through the aperture in the cap, or the closing portion of the cap may be placed over the mouth of the nozzle to close its orifice, means being provided whereby as the closing portion of the cap is brought into closing position over the mouth of the nozzle, this closing portion of the cap is wedged and clamped tightly thereon to close it tightly and securely. Preferably means are provided for holding the cap captive, but permitting opening and closing movements.

When the closure is formed as an integral part of the container or receptacle, the discharge nozzle is formed directly thereon. When the closure is formed as a separate attachable device, a discharge nozzle is formed on the device and means are provided whereby the device may be attached to the receptacle or container with the nozzle of the device in communication with the nozzle or other discharge orifice of the container or receptacle.

In order that a clearer understanding of this invention may be had, attention is hereby directed to the accompanying drawing, forming a part of this application and illustrating certain possible embodiments of this invention, and in which:

Fig. 1 is a top view of a closure in the form of a separate attachable device, the closure being shown open; Fig. 2 is a sectional view thereof and is taken on the line 2-2 of Fig. 1, and indicates by dot and dash lines a part of a container, such as a collapsible tube, having the closure device attached thereto; Fig. 3 is a top view of the same, closed, certain parts being broken away and other parts being shown in section; Fig. 4 is a side view of the same, the device being closed; Fig. 5 is a top view of a modified form of a closure embodying this invention, and formed as an integral part of a container or receptacle, for instance, a collapsible tube, the closure being shown open, with the closed position of the cap indicated by dot and dash lines; Fig. 6

is a sectional view thereof, and is taken on the line 6—6 of Fig. 5, the body of the container being broken away; and Fig. 7 is a side view thereof, partly in section, the container being closed and the body of the container being broken away.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Referring to the drawing: In the modification illustrated in Figs. 1 to 4 inclusive, the cap includes a top having a closing wall portion 10 and an aperture 11 of the same shape and just slightly larger than the diameter of the discharge nozzle 12 of the closure device. The aperture 11 is offset from the center point or axis of the cap. The cap has three portions 13 depending from the top near its periphery, each formed at its lower end with inwardly directed cam lug portions 14. Instead of spaced depending members 13, the cam elements 14 may be provided on a circular flange or apron depending from the cap top, and the cam elements may be separate members instead of integral bent-in portions.

The cap is mounted on a body or retaining member 15, provided with three cam shoulders or flanges 16, one for each of the cam elements 14, and with which the cam elements coact to wedge and hold the closing portion of the cap tightly on and over the mouth of the nozzle 12 to close the orifice therein tightly and securely. The body member 15 is also provided with three stop ridges or shoulders 17 adapted to be engaged by the cam elements 14 to limit the rotative movement of the cap, and to prevent the cam elements from passing beyond their respective cam surfaces.

The nozzle 12 may be formed integrally on the body member 15 or may be applied thereto as a separate element, and is so located that the aperture 11 of the cap may be brought exactly in alignment over the nozzle, permitting the top of the cap to be brought down upon the top of the body member 15 with the nozzle 12 projecting well outwardly of the cap, as shown in Fig. 2. The body member is provided with suitable means whereby the closure device may be attached to a container. For instance, the body member 15 may be provided with a threaded socket portion 15' into which the threaded nozzle 18 of a collapsible tube 23 or other container or receptacle may be screwed after the cap of such tube, container or receptacle has been removed. A passage 19 is formed in the body member 15 which places the discharge orifice of the collapsible tube, or other container or receptacle, in communication with the discharge orifice 20 of the nozzle 12. Preferably the body member 15 is provided with an apron portion 21 adapted to encircle the top portion of the tube, or other container or re-

ceptacle, to which the closure device is attached. This apron portion may serve as a convenient finger grip to be grasped when the cap is turned to open the container, and thus to guard against the possibility of the turning force unscrewing the closure device from the container, instead of merely rotating the cap relatively to the body member.

The operation of this closure device is as follows: Assuming the device to be open, as shown in Figs. 1 and 2, to close it, a person merely takes hold of the cap, pulls it outwardly until the closing portion 10 of the cap is beyond the end of the nozzle 12 (preferably and naturally until the cam elements 14 strike the cam shoulders 16) and then turns the top in the proper direction (stop shoulders 17 preventing the opposite rotation), until he feels that the closing portion 10 of the top has been tightly wedged down on and over the mouth of the nozzle 12. The wedging and the clamping of the closing portion of the cap on the nozzle is effected automatically by the coaction between the cam elements 14 and the cam surfaces provided by the cam shoulders 16 with which they coact. When the closing portion of the top is thus tightly clamped on the top of the nozzle 12 the cam elements will consequently also be clamped tightly against their coacting cam surfaces, with the result that the top is held firmly in place against accidental opening movement, and will not be apt to jar loose or to become open by itself.

Preferably the body member 15 of the closure device is provided with inclined surfaces or projections 22, shown best in Fig. 2, with which the cam elements 14 are adapted to engage when the top is fully depressed to hold the cap from falling outwardly by gravity when the closure is open and is held upside down; thus preventing any inadvertent obstruction of the open nozzle and interference with the dispensing of the contents.

The modification illustrated in Figs. 5, 6 and 7 shows the closure formed as an integral part of a container or receptacle, such as a collapsible tube. In this modification the top of the cap has a closing portion 25 and an aperture 26 of half-moon shape at one side of its center point. Depending from adjacent the periphery of the top, are three symmetrically spaced depending portions 27, each provided with a cam element 28. Each cam element slidably engages in a cam groove 29 individual to it and formed in the periphery of a circular portion 30 provided at the top of the body 31 of the collapsible tube. The top of the container is closed by an integral top wall 32, from which extends the discharge nozzle 33 of the tube, this nozzle being provided with an orifice 34 through which the contents of the tube are dispensed. Nozzle 33 is sidewise of the center point or axis of the cap and is so disposed that it may

be protruded through the aperture in the top of the cap. Each cam groove 29 is so shaped that when the cap is turned in one direction, say in the opening direction, the closing portion of the cap will be automatically raised slightly from the top of the nozzle 33, then withdrawn from the nozzle, and then depressed so that the closing portion of the cap will rest on or close to the top wall 32 of the tube and the nozzle 33 will project an appreciable distance outwardly through the aperture 26 of the cap. A slight further rotation will engage the cam elements 28 in an end portion of each cam groove which holds the cap in open position and prevents its falling outwardly and turning by gravity should the tube be turned upside down. Conversely, when the cap is rotated in the reverse direction, the shaping of the cam grooves will first take the cam elements out of the retaining end portions of the cam grooves, and further rotation will cause the cap to rise automatically until the closing portion of the cap is beyond the end of the nozzle 33, and then further rotation will take the closing portion of the cap over the nozzle 33 and tightly down on and over the nozzle with wedging and clamping action, effectively closing the tube.

In either modification, when the cam elements are carried by portions which have open spaces between them, instead of on a continuous annular band, it is believed that any material, such as some of the contents of the tube or container, which may become deposited about the nozzle, or beneath the top of the cap, may be flushed out more easily and efficiently, and facilitates the cleaning of the closure.

Obviously, both modifications of the invention shown are amenable to wide modification without departing from the scope of this invention. For instance, the separate closure device, such as shown in Figs. 1 to 4 inclusive, may be provided with the cam grooves, such as are shown in Figs. 5, 6 and 7, and the integral construction, such as shown in Figs. 5, 6 and 7, may be provided with merely the cam surfaces and stop shoulders, as shown in Figs. 1 to 4 inclusive, instead of with cam grooves. Also the body portion of the closure, shown in Figs. 1 to 4 inclusive, may be made in several parts or pieces suitably secured together, instead of in one piece, and if the separate closure is to be applied to a bottle, instead of to a container having an externally threaded nozzle, the body member may be provided with a cork or other attachment member having a discharge aperture therethrough, or with other means whereby the closure device may be attached to such bottle, receptacle or container.

If desired, the closure device may be formed with or have attached thereto means, such, for instance, as eyelet 35, shown as be-

ing formed at the top of the apron member 21, whereby the closure and container attached thereto may be conveniently hung up on a suitable hook or nail, 36.

Also, if desired, the containers when being filled, or when shipped from the plant, may have the usual screw caps applied to the nozzles, with the captive cap in either closed or open position, as desired, it being contemplated that when the ultimate consumer starts to use the tube, he will remove and discard the screw cap and thereafter open and close the container by means of the captive cap alone.

Accordingly, as many changes could be made in the constructions which have been shown in the drawing and described in the foregoing description, and as many different embodiments of this invention could be made without departing from the scope thereof, it is understood that all matter contained in the above description, or shown in the accompanying drawing, shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member.

2. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member, and means associated with said projecting member and closure member for holding the closure member in captive association with the projecting member.

3. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion

of the closure member covers and closes the orifice of the projecting member, and means associated with said projecting member and closure member for releasably holding the closing portion of the closure member in tight closing position on and over the orifice of the projecting member.

4. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member, and means associated with the projecting member and the closure member for drawing the closing portion of the closure member tightly down on the projecting member over its orifice as the closure member is rotated in a certain direction.

5. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member, and means associated with the projecting member and the closure member for drawing the closing portion of the closure member tightly down on the projecting member over its orifice as the closure member is rotated in a certain direction, and means associated with said members for releasably retaining said closing portion in said position.

6. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member, and means associated with the projecting member and the closure member for drawing the closing portion of the closure member tightly down on the projecting member over its orifice as the closure member is rotated in a

certain direction, and for drawing the aperture of the closure member inwardly along the projecting member so that the projecting member will protrude therethrough, as the closure member is rotated in another direction.

7. A closure device of the character described, including, the combination with a projecting member having a discharge orifice of a closure member eccentrically associated therewith, and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member, and means associated with the projecting member and the closure member for drawing the closing portion of the closure member tightly down on the projecting member over its orifice as the closure member is rotated in a certain direction, and for drawing the aperture of the closure member inwardly along the projecting member so that the projecting member will protrude therethrough, as the closure member is rotated in another direction, and means for releasably retaining said closure member in the latter position.

8. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member, and means, including interengaging cam elements and cam surfaces associated with said projecting member and closure member, for holding the closure member in captive relation to the projecting member and for drawing the closing portion of the closure member tightly down on the projecting member over its orifice as the closure member is rotated in a certain direction.

9. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which

the closing portion of the closure member covers and closes the orifice of the projecting member, and means, including interengaging cam elements and cam surfaces associated with said projecting member and closure member for holding the closure member in captive relation to the projecting member and for drawing the closing portion of the closure member tightly down on the projecting member over its orifice as the closure member is rotated in a certain direction, and for releasably retaining said closing portion in that position.

10. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member, and means, including interengaging cam elements and cam slots associated with said projecting member and closure member, for holding the closure member in captive relation to the projecting member and for first placing the closing portion of the closure member outwardly of the end of the projecting member and then drawing said closing portion tightly down on the projecting member over its orifice, as the closure member is rotated in a certain direction from a certain rotative position.

11. A closure device of the character described, including, the combination with a projecting member having a discharge orifice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto selectively into one position in which the projecting member projects through and outwardly of the aperture of the closure member and into another position in which the closing portion of the closure member covers and closes the orifice of the projecting member, and means, including interengaging cam elements and cam slots associated with said projecting member and closure member, for holding the closure member in captive relation to the projecting member and for drawing the closure member inwardly along the projecting member so that the projecting member will protrude through and outwardly of the aperture, as the closure member is rotated in a certain direction from a certain rotative position.

12. A closure device of the character described, including, the combination with a projecting member having a discharge ori-

fice, of a closure member eccentrically associated therewith and having an aperture and a closing portion, and so mounted as to be rotatable and bodily movable relatively thereto, and means, including interengaging cam elements and cam slots on said members, directing the bodily movement of the closure member as it is rotated, and drawing and holding the closing portion of the closure member tightly down on and over the orifice of the projecting member, when the closure member is rotated in one direction, and so placing the closure member that the projecting member protrudes through and outwardly of the aperture of the closure member, when the closure member is rotated in the reverse direction.

13. A closure device of the character described, including, the combination with a projecting nozzle, a carrier portion surrounding said nozzle eccentrically inwardly of its projecting portion, a closure cap concentrically mounted on the carrier portion and rotatable and axially movable thereon, said cap having a top provided with an aperture for the nozzle to protrude through and a closing portion adapted to fit over and close said nozzle, and means, including interengaging members on the carrier portion and cap, for retaining the cap on the carrier portion and for drawing and holding the closing portion of the cap tightly down on the nozzle when the cap is rotated in a certain direction.

14. A closure device of the character described, including, the combination with a projecting nozzle, a carrier portion surrounding said nozzle eccentrically inwardly of its projecting portion, a closure cap concentrically mounted on the carrier portion and rotatable and axially movable thereon, said cap having a top provided with an aperture for the nozzle to protrude through and a closing portion adapted to fit over and close said nozzle, and means, including interengaging members on the carrier portion and cap, for retaining the cap on the carrier portion and for drawing and holding the closing portion of the cap tightly down on the nozzle when the cap is rotated in a certain direction, and for drawing the cap downwardly about the nozzle so that the nozzle projects through and outwardly of the aperture of the cap, when the cap is rotated in the reverse direction.

15. Closure means of the character described, including, in combination, a body member provided with an off-center projecting nozzle, a cap encircling said body member and nozzle and having an off-center aperture and an off-center closing portion, said cap being rotatable on the body member while maintaining said encircling relation thereto to place said aperture and said closing portion selectively over said nozzle, and being bodily shiftable inwardly and outwardly of the body member and nozzle to move the closing por-

tion axially upon and away from the top of the nozzle and to move said aperture axially inwardly and outwardly along the nozzle when the aperture is aligned therewith, and means, including interengaging members on the body member and cap, for holding the cap captive on the body member, and for releasably holding the closing portion of the cap tightly down on and over said nozzle.

16. A closure device of the character described, including, in combination, a body member having an eccentrically located projecting nozzle, a cap concentric with the body member and having an aperture and a closing portion, and rotatable and bodily movable on the body member into one position in which the closing portion fits over and closes said nozzle, and into another position in which the nozzle projects outwardly through the aperture of the cap, means, including interengaging members on the body member and cap, for retaining the cap on the body member and for drawing and holding the closing portion of the cap tightly down on the nozzle when the cap is rotated in a certain direction, attachment means on the body member, whereby the closure device may be attached to a container and means on the body member for placing the discharge orifice of the container in communication with the nozzle of the closure device when attached to the container.

17. A closure device of the character described, including, in combination, a body member having an eccentrically located projecting nozzle, a cap concentric with the body member and having an aperture and a closing portion, and rotatable and bodily movable relative to said body member, into one position in which the closing portion of the cap fits over and closes said nozzle and into another position in which the nozzle protrudes through and outwardly of the cap, means including interengaging members on the body member and cap for retaining the cap on the body member and for drawing and holding the closing portion of the cap tightly down on the nozzle when the cap is rotated in a certain direction, attachment means on the body member having a bore in communication with said nozzle, whereby the said closure device may be attached to a container with the discharge orifice of the container in communication with said nozzle.

18. A closure device of the character described, including, in combination, a body member having an eccentrically located projecting nozzle, a cap concentric with the body member and having an aperture and a closing portion, and rotatable and bodily movable on the body member into one position in which the closing portion fits over and closes said nozzle, and into another position in which the nozzle projects outwardly through the aperture of the cap, means, including interengaging members on the body

member and cap, for retaining the cap on the body member and for drawing and holding the closing portion of the cap tightly down on the nozzle when the cap is rotated in a certain direction, attachment means on the body member, whereby the closure device may be attached to a container, means on the body member for placing the discharge orifice of the container in communication with the nozzle of the closure device when attached to the container, and an apron portion extending from the body member so as to embrace a portion of the container to which the closure device is attached.

19. A closure device of the character described, including, in combination, a body member having an eccentrically located projecting nozzle, a cap concentric with the body member and having an aperture and a closing portion, and rotatable and bodily movable on the body member into one position in which the closing portion fits over and closes said nozzle, and into another position in which the nozzle projects outwardly through the aperture of the cap, means, including interengaging members on the body member and cap, for retaining the cap on the body member and for drawing and holding the closing portion of the cap tightly down on the nozzle when the cap is rotated in a certain direction, attachment means on the body member, whereby the closure device may be attached to a container and means on the body member for placing the discharge orifice of the container in communication with the nozzle of the closure device when attached to the container, and a hanger device affixed to the body member, whereby the closure device and a container engaged therewith may be suspended.

20. A container having a projecting discharge nozzle, a closure cap carrier portion eccentrically arranged about the nozzle inwardly of its projecting portion, and a closure cap concentrically mounted on the carrier portion and having a top provided eccentrically with an aperture and a closing portion, said cap being rotatable and axially movable on the carrier portion and relatively to said nozzle selectively into one position in which the nozzle projects through and outwardly of the aperture of the cap top and into another position in which the closing portion of the cap top is disposed over and closes the nozzle, and means, including interengaging cam elements and cam surfaces on the cap and carrier portion, for holding the cap captive on the container and for wedging the closing portion of the cap over the nozzle orifice when the cap is rotated in a certain direction on its carrier portion.

This specification signed this 8th day of March, 1932.

HENRY VAN ARSDALE.