This invention relates to metallic containers such as are commonly known to the trade as drums or barrels for the transportation or storage of oil, its derivatives and the like, the invention however, more particularly pertaining to a closing and sealing device for the filling and discharge openings of the containers.

The main object of the invention is to provide a closure and sealing device of a structure wherein the parts thereof are so related in their assembly, as to provide a plurality of seals in the closing device of each container opening, and the last seal to be applied, serving to prevent undetectable access or tampering.

Another object is to provide a closure and sealing device of a plurality of parts which are made cooperable one with the other, and with each part provided with a cooperable gasket for positive sealing of a container opening.

A further object is to provide a closure structure embodying a threaded bushing which is compressed into the metal surrounding the opening of a wall of a container, and secured thereto by curling the extending end of the bushing over the end of the material of the opening, and a cap mounted over the bushing, having a gasket in effective side sealing engagement with the free end of the curled over end of the bushing.

A still further object of the invention is in securing a threaded bushing in an opening of a container wall by curling an end of the bushing over the extending end of the material of the opening, mounting a gasket carried closure plug in the threads of the bushing with the gasket thereof, in engagement with one end of the bushing threads, and securing a cap having a gasket mounted in the skirt thereof, over the bushing and the plug, with the gasket in sealed tight engagement against and under the free end of the curled over part of the bushing.

Other and further objects will appear in the specification and be specifically pointed out in the appended claims, reference being had to the accompanying drawings, exemplifying the invention, and in which:

Figure 1 is a fragmentary plan view of a barrel head showing this improved closure and sealing device applied thereto, with a portion of the upper structure of the device shown partly in section.

Figure 2 is a side elevation partly in section, taken approximately on the line II—II of Fig. 1, illustrating the position of the sealing cap before its securement thereon.

Figure 3 is a vertical section taken approximately on the line III—III of Fig. 1.

Figure 4 is a side elevation of the gasket carrying closure plug which forms one of the parts of the device, a fragmentary portion of the gasket being broken away and shown in section.

Referring to the drawing, 5 designates a portion of a barrel head of a sheet metal container, the head having an outwardly pressed part forming a pocket 6, and concentrically extended from the material of the pocket an upstanding neck or flange 7. Mounted in the neck 7 is a bushing 8 which is interiorly threaded as designated at 9, said bushing having a flange 10 with radially extending projections engaged in the pocket 6, the projections of the flange sealing in similarly formed recesses which are radially extended from the pocket 6.

For securing the bushing 8 in the neck 7 and the flange 10 thereof in the pocket 6, a relatively thin wall 11 is extended from the bushing above the upper end of the threads 9 and is curled over the free end of the neck as designated at 12, the curling of said wall tightly drawing the bushing in the neck wherein the flange 10 of the bushing will securely engage the gasket 13 which is interposed between the flange 10 and the material of the head and/or the pocket 6.

The manner in which the thin wall 11 extends from the upper end of the thread provides a seat 14 at the upper end of the threads 9 of the bushing 8 for the gasket 15 which is carried in the groove 16 of a closure plug 17 which is adapted to be mounted in the bushing in engagement with the threads 9 thereof.

The plug 17 is provided with a flange 18 in proximity to the groove 16 in which the gasket 15 of the bushing is mounted, the diameter of the bushing flange being approximately that of the outside diameter of the bushing threads 20 and the bushing flange being of less diameter than that of the inner periphery of the thin wall 11 of the bushing.

The gasket groove 16 of the plug 17 is relatively deep, and in fact considerably deeper than the threads of the bushing so that said gasket which is relatively wide, can be maintained in position in the groove when the plug is removed from the bushing, and further, so that the gasket which has an outside diameter greater than the plug as shown in Fig. 4, cannot be forced or pulled out of the groove when the plug and gasket are being mounted in closing position in the bushing, by frictional engagement of the outer periphery of the gasket with the wall 11 of the bushing.
Containers of the character for storing and shipping oil, gasoline and the like, are generally provided with both a filling and a pouring opening, the pouring opening being smaller in diameter than the filling opening, and obviously it is necessary that both openings be efficiently sealed for both transportation and storage purposes. When a container is filled, the plug 17 is threadingly engaged in the threads 9 of the bushing, to prevent leakage at the joint, and the plug being provided by the polygonal walled recess 18 formed in the plug.

The gasket 15 employed in the groove 16 of the plug 17, is of a composition to obtain and maintain resilient flexibility, so that the tightening operation of the plug in the bushing 8, will not only compress the gasket 15 between the plug flange 18 and the bushing gasket seat 14, but will also crowd the marginal edge portion 21 of the gasket which extends beyond the periphery of the plug flange 18, upward into, and between the plug flange periphery and the inner periphery of the bushing wall 11. This manner of compressing and seating the gasket 15 will provide a seal both on the gasket seat 14 and against the bushing wall 11 and the upwardly forced interposed annular marginal portion 21 of the gasket being in the plug flange 18 and the curved part or beaded portion 12 of the bushing wall 11, will also form a further sealing by the gasket 15 and in addition, the plug flange 18 will be prevented from contacting with the bushing gasket seat 14 by reason of the specified manner of the functioning of the interposed gasket.

In structures of this character having what is known as a pressed-in bushing, held in the barrel head without being spot welded thereto, it may occur that seepage will develop between the bushing and the barrel neck 7, with a consequent leakage of the barrel contents, even though a gasket such as designated at 13, is employed between the bushing flange 16 and the barrel wall, particularly in the event that said gasket develops to be faulty. For preventing this leakage, a sealing cap 22 is used.

After the plug 17 has been mounted in a seal tight closing position in the threaded opening of the bushing 8 and is secured therein by proper manipulation in respect to seating the gasket 15 in the manner shown in Fig. 2, the cap 22 having a depending skirt 23 with an annular groove 24 therein, and a gasket 25 in the groove, is mounted over the extending end of the bushing and/or the beaded portion 12 thereof, in the manner shown in Fig. 2.

The sealing cap 22 is of a size so that the inner periphery of the gasket will fittingly pass over the outer extremity of the beaded portion 12 of the bushing, and the gasket is of a thickness to fill the groove 24 in which it is mounted so that the inner periphery of the gasket will be in flush alignment with the depending lower portion 26 of the skirt 23 of the cap.

After positioning the cap 22 over the beaded portion 12 of the bushing, a tool with clamping jaws is engaged therewith, and operated to engage the skirt 23 and/or the depending lower portion 26 of the skirt 23, in the manner shown in Fig. 3, wherein the lower depending portion 26 of the skirt will be tightly engaged against the outer periphery of the neck 7, and that part of the skirt above the portion 26 will be uniformly inwardly inclined for compressing the gasket 25 tightly against the outer periphery of the beaded portion 12 of the bushing 8 and in annular under engagement with the free end 27 of the beaded portion.

The compressed tight engagement of the cap skirt gasket 25, with the perimeter of the beaded portion 12 and particularly the pressed tight under engagement of that portion of the gasket beneath the free end 27 of the beaded portion will provide a sealed tight joint at the juncture of the lapping face end 27 of the beaded portion 12 with the barrel neck 7, capable of preventing leakage from the barrel, through the lapped joint.

From the foregoing, it is therefore obvious that a leak proof closure is provided by the plug and its gasket, for preventing leakage through the bushing opening, and that the side sealing engagement of the cap skirt carried gasket 25, will prevent leakage from a location between the bushing head and/or barrel neck and the outside of the bushing. It is further obvious that in the event the plug carried gasket 15 becomes faulty in its seal tight engagement between the plug and the bushing seat 14, that the cap skirt carried gasket 25 will prevent seepage of the leaking fluid after it has passed the plug gasket 15.

In addition to the sealing cap 22 with the gasket 25 in the skirt thereof, serving as a last and final seal for the structure, the cap also provides a means in serving to prevent undetected access or tampering of the closure structure by unauthorized persons, because any attempt to remove the sealing cap would be an indication to the consignee or recipient of the goods, that the container thereof had been tampered with. Thus, undetectable tampering is guarded against.

Owing to it being a requirement of the invention that the marginal edge portion 21 of the plug gasket 15, be interposed between the plug flange 18 and the beaded portion 12 of the bushing, the plug flange 18 will not be wholly confined within the wall 11 of the bushing but will project somewhat above the beaded portion 12. For this reason and for providing proper sealing engagement of the sheet metal cap 22, the intermediate portion of the cap top is raised, as shown at 28 in conformity with the size and shape of the plug flange 18, so that when the cap is being mounted on the plug and after the gasket 15 has been seated, the raised portion of the cap will properly center the skirt 23 of the cap in over-engagement with the perimeter of the beaded portion 12.

The cap 22 on its top, outwardly of the intermediate raised portion 28, is provided with an annular portion 29 for seating engagement on top of the beaded portion 12, said portions 28 and 29 forming solid resting portions for a cupping tool during contracting of the skirt 23 of the cap, for securing the cap in seal tight engagement over the plug, the beaded portion 12 of the bushing and the barrel neck or flange 7.

The cap 22 on its top and skirt portion is provided with a pair of spaced diametrically extended scoring or weakened lines 30, and for cooperation with said lines for tearing away the material of the cap top between said lines, are end dies for coacting the cap skirt, in the manner shown in Fig. 2.

The recipient of the barrel or container can readily insert a tool in an aperture of one of the tabs for carrying on the tearing operation for authorized removal of the cap for providing access to the polygonal tool engaging recess 18 of the plug and gasket 25 for removal of the plug.

Having thus described the invention so that
those skilled in the art will be able to practice
the same, what I desire to secure by Letters Pat-
ent is defined in what is claimed, it being under-
stood that various changes in the device shown
and described above in detail and not amounting
to invention, may be made without departing
from the spirit and scope of my invention.

What I claim is:—

1. In structure of the class described, means
forming an opening in a wall of the container
which includes an outwardly extending annular
flange and a bushing surrounded by said flange
having a part turned upon the latter to provide
a lapped joint at the outer end of the flange, a
bush mounted over said bushing having its side
wall contracted behind said lapped joint, said
cap having a groove formed in its side wall, and
a gasket carried by the groove of the cap for
over-lapping and sealing the free end of the
lapped joint of the bushing.

2. In structure of the character described,
means forming an opening in the wall of a con-
tainer, said opening being surrounded by an up-
standing flange surrounding said opening, a
bushing in said flange having its upper end beaded
over the end of said flange, a seal cap for clos-
ing said opening having a skirt portion re-
ceived over said beard and flange and a gasket
confined between said skirt and the portions of
said beard and flange opposed thereto, said skirt
adapted to be contracted around said flange and
said gasket adapted on contraction of said skirt
to be pressed under said beard to seal the line of
joinder between said beard and flange.

3. In structure of the character described, means forming an opening in a wall of a con-
tainer, said opening being surrounded by an up-
standing neck with a bead around the outer end
thereof, a seal cap for closing said opening hav-
ing an uncontracted skirt portion received over
said beard and neck, said skirt portion holding a
gasket between it and the beard with the gasket
extending below the beard whereby, when said
skirt portion is contracted around said neck, said
gasket is pressed in tightly under said beard
to form a liquid-tight seal between said skirt and
the portions of said beard and neck opposed
thereto.

LOUIS B. WACKMAN.