This invention relates to a container closure and seal therefor and, in particular, to a closure for containers, such as steel salting drums, which are subjected to relatively rough handling. It frequently happens that the rough handling to which such shipping containers are subjected causes a slight movement between portions of the container and the closure which are in contact, with the result that flakes of the lacquer with which the container and closure are usually lined, fall off into the contents of the container, and similarly with particles of oxide such as rust, if any is present. This admixture of foreign matter with the material in the container is highly objectionable in many instances, such as powder for plastic molding of light colored articles. The problem is particularly serious in the handling of such material because it is customary to invert the containers before emptying them, to insure thorough mixture of various components.

I have invented a novel container closure and seal therefor which precludes direct contact between the container and closure, and thereby avoids the difficulty above mentioned. In addition, the seal of my container closure may be attached without the use of cement or other adhesive, and secures itself in position, although it may be removed if desired. The invention is not limited, however, to a seal formed apart from the closure. The shape of the seal makes it very effective in preventing loss of the material in the container and in excluding the atmosphere and other foreign materials therefrom.

In accordance with my invention, I provide a closure including a disc portion and a tubular portion upstanding therefrom, having an outwardly extending rim. For example, I employ a gasket having a body portion adapted to cooperate with said rim, and a depending neck portion adapted to extend inwardly along said tubular portion of the closure, spacing the latter from the container wall. I preferably provide a small clearance space between the neck of the gasket and the portions of the closure and container thereadjacent. When the closure is applied to a container, the body of the gasket is engaged by the usual false wire surrounding the open edge of the container, while the depending neck of the gasket extends inwardly of the container opening and entirely separates the closure therefrom, avoiding all metal to metal contact interiorly of the closed container. Other features of the construction and certain modifications thereof will become apparent as the following detailed description thereof proceeds. Such description should be read in connection with the accompanying drawing illustrating a preferred embodiment and certain modifications of the invention. In the drawing,

- Fig. 1 is a partial section through the closure;
- Fig. 2 is a similar section through the gasket;
- Fig. 3 is a plan view of the gasket;
- Fig. 4 is a sectional view of the closure having the gasket applied thereto;
- Fig. 5 is a partial sectional view showing the closure and gasket applied to a container;
- Fig. 6 is a view similar to Fig. 5 showing a modification; and
- Fig. 7 is a similar view showing a further modification.

Referring now in detail to the drawing, a closure 10 comprises a central disc-like portion 11, a tubular or cylindrical portion 12 upstanding therefrom, and a rim 13 extending outwardly and downwardly from the tubular portion 12. The closure is preferably made in one piece by methods and apparatus well known to the metal-shaping art. The rim 13 is substantially semi-circular in cross section. An outwardly extending bead 14 is rolled into the tubular portion 12 for a purpose which will become apparent later. The disc-like portion 11 of the closure is dished or convex upwardly, and is provided with a strengthening bead 15. The gasket 16 comprises a body portion 17 and a neck portion 18 depending therefrom. The gasket is preferably made of elastic material such as rubber, fiber or the like, and may conveniently be formed up from straight stock by cutting to length and vulcanizing the ends of the lengths, as at 16', to form a circular gasket. When so formed, the neck portion 18 should have a slight taper, as indicated in Fig. 2, of about 10°, so that the minimum diameter thereof will be slightly less than that of the tubular portion 12 of the closure 10. The thickness of the neck is slightly less than the width of the space between the portion 12 of the closure and the adjacent portion of the container, leaving a slight clearance or looseness of fit as at 18'. The body portion 17 of the gasket is substantially semi-circular in cross section so as to fit snugly under the rim 13, and has a passage 19 therethrough, a section of which is of segmental shape. The neck and body, in
stead of being integral as shown, may be separately formed.

The gasket 16 may be pressed onto the tubular portion 12 of the closure 10 by any convenient means, the body portion 17 thereof being forced home against the rim 13, and the tapered neck portion 18 being deformed slightly by stretching. The neck portion contracts slightly after passing the tubular portion 18 in the tubular portion 12 and, because of the tension in the lower edge of the neck, the latter lugs the tubular portion 12 tightly, and engagement of the neck against the bead 14 tends to hold the gasket in place. This makes it unnecessary to use a cement or other adhesive to secure the gasket to the closure. The gasket 16 may be formed in situ on the closure by methods and apparatus suited to the purpose if desired.

When the closure with the gasket in place is applied to a container 20 having a false wire or bead 21 thereon, the open end thereof, the neck 18 of the gasket fits somewhat loosely between and effectively separates the closure from the interior of the container, preventing metal to metal contact therebetween. When the closure is pressed on tightly, the body portion of the gasket, as shown in Fig. 5, but the clearance 18 between the container and the neck portion 18 is unaffected. This facilitates application of the closure to the container. The shape of the body portion of the gasket and the passage therethrough is such that the body of the gasket yields readily adjacent the middle of its section, and has tight sealing engagement with the false wire on each side thereof. In other words, the shape of the gasket and the opening therethrough is such that the gasket engages the false wire 21 adjacent the sides thereof more tightly than at the top. In effect, this provides a double seal against loss of the contents or entrance of air or other foreign matter. The closure is preferably secured to the container by any convenient form of clamp, not shown.

Since there is no metal to metal contact between the closure and container interiorly of the latter, there is no chance for lacquer or oxide, such as rust, to be rubbed off of the container or the closure as a result of rough handling, the gasket is attachable without an adhesive cement and normally retains itself in position by virtue of the tension in the portion thereof which is stretched in applying it to the closure or container. This does not, however, prevent removal of the gasket from the closure or container, if such is desired. The shape of the gasket and the opening therethrough contribute to a more effective sealing than has been obtainable with the closures and seals thereof known heretofore. The loose fit of the neck of the gasket between the container and closure makes it easy to put the latter on the former.

Although I have illustrated and described herein but one preferred embodiment of the invention and certain modifications thereof, it will be understood that changes in the construction illustrated may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. In combination, a container having an out-turned rim, a closure therefor having a neck portion which enters the container and provides an annular space between the outer surface of the neck portion and the adjacent wall of the container, the upper end of the closure being turned outwardly and overlying the rim of the container when the closure is applied and means interposed between the container and closure comprising a sealing portion lying between at least a portion of the rim portion of the container and the outwardly projecting portion of the closure and adapted to be compressed upon tightening of the closure upon the container to seal the container and a generally annular neck portion extending from said sealing portion generally inwardly of the container and lying in the annular space between the container and the neck portion of the closure, the clearance or space between the container and the neck portion of the closure being greater than the thickness of said neck portion of the sealing means throughout the extent of said neck portion of the sealing means.

2. In combination, a container having an out-turned rim, a closure therefor having a neck portion which enters the container and provides an annular space between the outer surface of the neck portion and the adjacent wall of the container, the upper end of the closure being turned outwardly and overlying the rim of the container when the closure is applied and means interposed between the container and closure comprising a sealing portion lying between at least a portion of the container rim and the outwardly projecting portion of the closure and adapted
there to be compressed upon tightening of the closure upon the container to seal the container and a generally annular neck portion extending from said sealing portion generally inwardly of the container and lying in the annular space between the container and the neck portion of the closure, said neck portion of the sealing means being loosely positioned between the container and the neck portion of the closure throughout the extent of said neck portion of the sealing means.

3. In combination, a container having an outturned rim, a closure therefor having a neck portion which enters the container and provides an annular space between the outer surface of the neck portion and the adjacent wall of the container, the upper end of the closure being turned outwardly and overlying the rim of the container when the closure is applied and means interposed between the container and closure comprising a sealing portion lying between at least a portion of the container rim and the outwardly projecting portion of the closure and adapted there to be compressed upon tightening of the closure upon the container to seal the container and a generally annular neck portion lying between at least a portion of the container rim and the outwardly projecting portion of the closure and adapted there to be compressed upon tightening of the closure upon the container to seal the container and a generally thin generally annular neck portion extending from said relatively thin sealing portion generally inwardly of the container and lying in the annular space between the container and the neck portion of the closure, said relatively thin neck portion of the sealing means being loosely positioned between the container and the neck portion of the closure throughout the extent of said neck portion of the sealing means.

5. A closure for a container having a neck portion which enters the container and provides an annular space between the outer surface of the neck portion and the adjacent wall of the container, the upper end of the closure being turned outwardly to overlie the rim of the container when the closure is applied and means interposable between the container and closure comprising a sealing portion adapted to lie between at least a portion of the container rim and the outwardly projecting portion of the closure and adapted there to be compressed upon tightening of the closure upon the container to seal the container and a generally annular neck portion extending from said sealing portion and adapted to project generally inwardly of the container and to lie in the annular space between the container and the neck portion of the closure, the neck portion of the sealing means being loosely positionable between the container and the neck portion of the closure throughout the extent of said neck portion of the sealing means.

6. The article defined by claim 1, characterized by said means having at its inner surface an inwardly extending flange engaging said closure.