Our invention relates to improvements in metal containers and closures thereof and is particularly concerned with improving coffee containers and the like which are at least partially vacuumized just prior to the final sealing operation.

Among the important objects of our invention is the provision in a sheet metal container of an upper end wall construction which will greatly facilitate proper positioning of the closure thereupon and additionally facilitate removal of the closure by the consumer. To this end the wall is formed with an annular upstanding bead in proximity to the filling and discharge opening, such bead being so shaped that it will have a tendency to direct a closure coming in contact therewith, to a position directly over the filling opening. The bead also provides a continuous fulcrum point for a prying implement which may be used in removing the closure.

A further object of our invention is the provision of an upstanding wall for the filling opening which is relatively stiff or inflexible and so shaped as to facilitate centering and mechanical application of a closure to the container.

A further object of our invention is the provision of a sheet metal closure, the attaching skirt or flange of which is formed with hollow vertical beads on the exterior surface thereof, which beads provide internal vents and perform the two-fold function of rapidly venting air to the interior of the container upon initial breaking of the seal between the closure and container and contracting the skirt or flange about the wall of the filling opening to thereby securely attach the closure to the container.

Above all, it is an object of our invention to provide a novel and unusually efficient metal container which may be vacuumized and will continue to be vacuumized over a considerable period of time, yet one which may be opened by the consumer with little difficulty and without any likelihood of there being such a complete instantaneous breaking of the vacuum as will result in blowing out a considerable volume of the contents.

Another important feature of our invention is the provision of a container and closure thereof which latter is unusually well adapted for use as a reseal. The exceptional adaptation of our closure to this use is due largely to the contractile skirt or flange which effectively grips the wall of the opening and secures the sealing ring in engagement with the sealing surface of said wall.

Other objects will be apparent hereinafter.

In the drawing:

Fig. 1 is a fragmentary perspective view of the container and closure embodying our invention;
Fig. 2 is a transverse sectional view showing the container and closure structure and illustrating particularly the closure centering feature;
Fig. 3 is a fragmentary sectional elevational view showing the manner in which the closure is removed from the container;
Fig. 4 is a detail sectional view showing the closure in sealing position and a prying implement about to remove the closure;
Fig. 5 is a view similar to Fig. 4 showing the closure partially separated from the container; and
Fig. 6 is a sectional view taken substantially along the line 6—6 of Fig. 4.

Our improved container comprises a body 10 of any preferred configuration having an upper end wall 11 suitably connected thereto, as for example, by a double seam 12. This upper end wall or breast is provided with a central filling and discharging opening 13 which is defined by an upstanding annular wall 14, the upper margin 16 of which is inclined or tapered inwardly and upwardly and thence turned inwardly to form a top sealing surface and an internal stiffening bead 16 which lends rigidity to said wall. Spaced radially outward from the upstanding wall 16 of said central opening is an external upwardly projecting rib 17 which provides a continuous fulcrum point uniformly spaced from the filling opening and functions as a rest for a prying implement 18, which as will be apparent, is utilized in the removal of the closure C. This rib 17 together with a rib 19, which is formed between the first named rib and the seam 12, also cooperate in stiffening the upper end wall of the container.

The closure C consists basically of a circular top portion 20 and expandable attaching skirt 21 or flange provided at the margin of said top portion. Preferably the top portion 20 is more or less dish-like in shape in that the major central portion thereof is prefrcly flat and the marginal area 22 is tapered outwardly and upwardly to a point at which it joins with the upper margin of the depending attaching skirt 21. Within the closure at the juncture of the top portion 20 and skirt 21 and in a plane above the major central portion 20 of the top, a sealing ring 23 or gasket is secured to the metal. This gasket may be of any well known or preferred
form but preferably is of that type which is ordi-
narily flowed into the closure and vulcanized. As to this feature, however, it is understood that we are not restricted to any specific form of gasket.

Preferably the lower margin of the attaching skirt 21 is rolled to provide an external bead 24, this bead being positioned externally in order that the skirt proper may snugly engage the wall 14 of the opening and additionally provide an effect a ledge or projection designed to be engaged by the prying implement 18. For the two-fold purpose of rendering the attaching skirt 21 ex-
pansible and providing vents through which air may rather quickly enter the container upon initial separation of the closure from the con-
tainer, the skirt is provided with an annular series of external hollow ribs 25 which extend from a point substantially in line with the lower edge of the sealing gasket downward through the beaded lower margin of the skirt. These ribs 25 allow for expansion of the skirt during application of the closure to the container, the wall 14 of which is of slightly greater external diameter than the normal internal diameter of said skirt. Thus an extremely firm engagement between the closure and container is obtained with the result that anticipated abnormal internal pressures will not accidentally displace the closure.

These ribs, owing to the fact that they are hollow and formed exteriorly of the skirt, pro-
vide internal channels or vents which operate immediately upon initial separation of the seal-
ing gasket 23 from the upper end of the bead 16, to permit small volumes of air (the total being considerable) to enter the container and quickly reduce the vacuum. Thus, as has been pointed out heretofore, there is no sudden in-
rush of a great volume of air which actually would blow the closure off of the container and
blow out a considerable volume of the contents, particularly if the latter happened to be coffee or some similar granular material. As a result of the entry of air through the vents, the pressure on opposite faces of the closure is equalized. Removal of the closure is thereby materially facilitated. These vents also prevent premature complete displacement of the closure due to in-
ternal pressure created by the evolution of gas in the packed merchandise, coffee, for example.

As has been pointed out rather briefly hereto-
fore and is clearly illustrated in Fig. 2 of the drawing, the closure is more or less self-centering in that it is only necessary to place it upon the upper end of the container more or less in the general vicinity of the filling and discharging opening. This very obvious due to the rela-
tive diametrical dimensions of the skirt of the closure and upstanding wall defining the filling opening, together with the inwardly declined guiding surface 28 which is formed between said wall and the upstanding rib 17. It is readily ap-
parent that the tapered or inclined surface 28 will direct the closure into proper alignment with the filling opening immediately upon the applica-
tion of sufficient top pressure to the closure, even though the latter is positioned off center to the extent shown in Fig. 2 of the drawing. This feature is of considerable importance in that it avoids the necessity for extremely accurate ini-
tial positioning of the closures, such positioning being effected automatically or manually as cir-
cumstances may demand.

In Fig. 7 we have shown a modified form of attaching skirt 21 wherein the lower margin 21a is flared outwardly and then rolled outwardly, upwardly and then inwardly to produce an ex-
ternal bead 24, the diameter of which is equal to the diameter of an imaginary circle which touches the exterior of the several beads 25. The skirt is connected to the top portion of the closure by an annular channel-like portion 30 which is substantially inverted U-shaped in cross section.

Modifications may be resorted to within the spirit and scope of the appended claims.

We claim:

1. In combination, a container including a cylindrical body, a bottom therefrom, a top having an upstanding annular wall defining a central filling and discharging opening of considerably less diameter than said body, said wall having its upper margin inwardly and upwardly tapered to facilitate the skirted closure thereon, a continuous prv-off rib intermediate the body and said wall and merging into the lower edge of the latter, a sheet metal closure in-
cluding a circular top portion and a depending attaching skirt, the internal diameter of said skirt normally being somewhat less than the maximum external diameter of said wall, an external reinforcing bead at the lower edge of said skirts, and an external hollow rib formed in and transverse to the length of the skirt whereby the latter is capable of expansion to the maximum external diameter of said wall when subjected to top pressure during application of the closure.

2. In combination, a sheet metal container in-
cluding a circular body, an end wall having a circular filling and discharging opening of less diameter than said body, an upstanding wall about and defining said opening, said wall having its exterior upper portion tapered inwardly and formed at its free edge with an internal bead, an upstanding rib between the body and opening concentric with the latter and providing a com-
bined prv-off rib and closure guiding surface in-
clined inwardly toward and merging with the base of said wall, that portion of said inclined surface below substantially the medial point thereof being spaced from the diametrical oppo-
site point of said wall a distance substantially equal to the external diameter of a closure for the container, and a closure including a circular top portion and a resilient expansible attaching skirt.

3. In combination, a sheet metal container in-
cluding a circular body, an end wall having a circular filling and discharging opening of less diameter than said body, an upstanding wall about and defining said opening, said wall having its exterior upper portion tapered inwardly, an upstanding rib between the body and opening concentric with the latter and providing a com-
bined prv-off rib and closure guiding surface in-
clined inwardly toward and merging with the base of said wall, that portion of said inclined surface below substantially the medial point thereof being spaced from the diametrical oppo-
site point of said wall a distance substantially equal to the external diameter of a closure for the container, and a closure including a circular top portion and a resilient expansible attaching skirt.

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