This invention relates generally to a stopper or closure for all kinds of receptacles, which are designed to contain water or other liquids, either hot or cold, and more especially is intended for use as a closure for the filling opening of a rubber bag or other receptacle for holding crushed ice. As is known, such a bag is commonly used in hospitals and other places in the care and treatment of sick persons, and the stopper of such a bag, to be effective, must make a substantially hermetic closure or seal with the filling opening in order that there shall be no opportunity for leakage of the contents when the bag is in use.

The object of my invention is to provide an improved stopper for use with ice-bags which is simple in construction, which can be cheaply manufactured, and which is so designed with regard to the support for a packing element or washer that a watertight joint is practically ensured with proper positioning of the stopper in the filling opening, and without the exercise of any special care or physical effort to tightly screw the stopper in place.

A further object of my invention is to provide a stopper of the character described in which the washer or packing ring is permanently secured to the stopper in such a way as to ensure against its loss, and also to ensure that the washer is properly positioned with respect to cooperating structural features of the stopper which aid in making a fluid-tight joint. The other novel features and advantages of my invention will be disclosed in connection with the following detailed description of the construction, and which are shown in the several figures of the accompanying drawing forming a part of my specification.

In the drawings,

Fig. 1 is a plan view of a stopper applied to a conventional form of ice-bag, the outer contour of which is shown in dotted lines;

Fig. 2 is a partial sectional elevation of my improved stopper;

Fig. 3 is a bottom plan view with a part of the structure removed to illustrate the flange construction; and

Fig. 4 is a perspective view of the washer or packing ring used with my improved stopper.

Referring to Fig. 2, it will be seen that the stopper construction comprises, in general, only three elements, namely, the stopper or cover plate 1, the body-piece 2, and the washer or packing element 3. The elements 1 and 2 are both made of thin sheet-metal which can be easily pressed or spun into the desired shape; and the washer 3 is of rubber, or other suitable yielding packing material.

The cover-plate 1 is made from a circular blank, and, in the first stage of operation, is provided with straight down-turned flanges 4 and a peripheral bead 5. The central part of this blank is given a slightly outward bulging contour which is more pronounced near its outer edges.

The body-piece 2 may likewise be conveniently pressed or spun from a circular blank to form a hollow domed element, the side walls of which are spirally grooved to form screw-threads 6 and an outwardly extending flange 7 which is dimensioned to fit within the down-turned flange 4 of the cover 1. The flange 7, at substantially the middle of its width, is also formed with a continuous circular bead or rib 8, which extends downwardly to form a circular projection from its under surface. The outer edge of the flange 7 is shaped to contact with the peripheral bead 5 of the cover 1, but the remaining upper surface of the flange slopes away from, and is out of contact with, the metal of the cover 1.

With the body-piece 2, shaped as above described, and properly positioned within the down-turned flange of the cover, the flat washer 3 is then placed so as to encircle the threaded portion 6 and with its outer edge within the down-turned flange 4 of the cover 1. The final assembling operation consists then in bending inwardly the bottom of the flange 4, which operation secures together the three elements of the construction, and retains the washer in an inclined position, with its upper surface contacting with the bead or rib 8, and its inner portion free to flex when sealing pressure is exerted thereon. Furthermore, since the flange 7 is engaged only at its periphery, this flange forms a resilient and yielding backing for the washer, so that when flexed toward the cover 1, as when the stopper is screwed tightly within the filling opening of a container, the natural resiliency of the washer is augmented by that of its metal backing, and there is constant pressure exerted by the flange 7, which tends to firmly seat the washer against the contacting surface of the fill
ing opening, to make a tight joint there-with and to substantially minimize the chance of leakage around or between the washer and the surface with which it contacts.

The space between the elements 1 and 2 also constitutes a dead-air chamber, which constitutes an effective insulation, serving to prevent the transfer of heat through the stopper construction. This feature prevents the stopper from becoming too cold when used with an ice-container or too hot when used with a hot-water bag.

The specific details of the construction shown may be varied somewhat as will be apparent to one skilled in the art, without departure from the spirit of my invention; and what I claim as new and for which I desire to secure the protection of U. S. Letters Patent is:

1. In a stopper for containers comprising a circular cover-plate, a hollow threaded body-portion with an outwardly flaring easily flexed flange at its upper edge, the outer peripheral edge only of said flange contacting with the cover-plate, a yielding washer-element encircling the body portion and contacting with the under surface of the flange thereof, and securing means for permanently clamping all of the elements together at their outer edges with the flange of the body portion constituting a flexible backing for the washer-element, whereby a tightening of the stopper in the container deforms the flexible flange and a continual pressure is exerted thereby upon the washer element.

2. In a stopper for containers comprising a circular cover-plate with a down-turned flange at its outer edge, a hollow threaded body-portion having an outwardly flaring easily flexed flange at its upper edge to fit within the flange of the cover-plate, the outer peripheral edge only of the flange being otherwise out of contact with the under surface of the cover-plate, a circular rib formed in the flange of the body-portion contacting with the under surface thereof, a washer encircling the body portion and contacting with the rib on its under-surface, and securing means for permanently clamping all of the elements of the stopper together at their outer edges with the washer held in a downwardly inclined position and, whereby a tightening of the stopper in the container flexes the flaring flange of the body portion, and a continual pressure is exerted upon the washer by the rib of said flange.

3. In a stopper for containers comprising a circular cover-plate with a down-turned flange at its outer edge, a hollow threaded body-portion having an outwardly flaring easily flexed flange at its upper edge to fit within the flange of the cover-plate, the outer peripheral edge only of the flange being otherwise out of contact with the under surface of the cover-plate, a circular rib formed in the flange of the body-portion to constitute a continuous circular projection from the under surface thereof, a washer encircling the body portion and contacting with the rib on its under-surface, and securing means for permanently clamping all of the elements of the stopper together at their outer edges with the washer held in a downwardly inclined position and, whereby a tightening of the stopper in the container deforms the flaring flange of the body portion, and a continual pressure is exerted upon the washer by said flange.

4. In a stopper for containers comprising a circular cover-plate with a down-turned flange at its outer edge, a hollow threaded body-portion having an outwardly flaring easily flexed flange at its upper edge to fit within the flange of the cover-plate, the outer peripheral edge only of the flange being otherwise out of contact with the under surface of the cover-plate, a circular rib formed in the flange of the body-portion to constitute a continuous circular projection from the under surface thereof, a washer encircling the body portion and contacting with the rib on its under-surface, and securing means consisting of an intruding flange on the lower edge of the down-turned flange of the cover-plate for permanently clamping all of the elements of the stopper together at their outer edges, with the washer held in a downwardly inclined position between the clamping flange and the resilient backing formed by the flange of the body-portion, whereby a tightening of the stopper in the container flexes the flange of the body portion and a continual pressure is exerted upon the washer by said flange.

5. A hollow stopper construction formed of sheet-metal, the walls of which enclose a dead-air chamber for insulation purposes, comprising a circular cover-plate, a circular body-portion of less diameter, the side walls of which are formed with screw-threads, interfitting flanges formed upon the cover-plate and the body-portion, the flange of the body-portion extending laterally and being easily flexed to constitute a resilient backing for a washer, a washer positioned to encircle the hollow threaded part of the body-portion, and clamped at its outer edge between the interfitting flanges of the cover-plate and body-portion, the clamping means serving also to permanently unite into an
operative structure all the constituent elements of the stopper-construction, whereby a tightening of the stopper in a container flexes the flange of the body portion and a continual pressure is exerted upon the washer by said flange.

6. A stopper for containers comprising a cover, a hollow body portion having means for attachment to the container, a washer, and means for resiliently mounting the washer between the cover and the body portion, so that the washer contacts with the body portion over a limited area only whereby a tightening of the stopper in the container causes a continual resilient pressure to be exerted upon the washer by the area of the body portion contacting therewith.

In testimony whereof I hereunto affix my signature.

FREDERICK LOBL.