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C. HAMMER,
THREAD JAR CLOSURE.
FILED MAY 25, 1921.

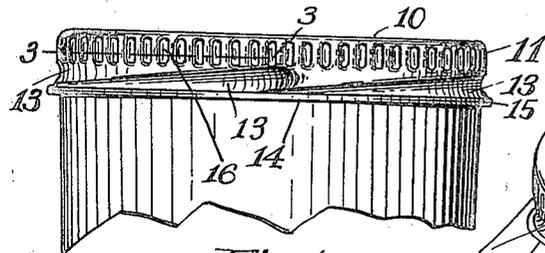


Fig. 1.

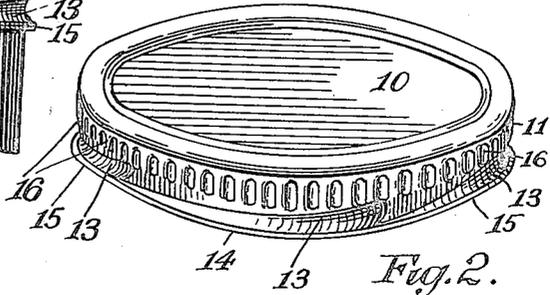


Fig. 2.

Fig. 3.

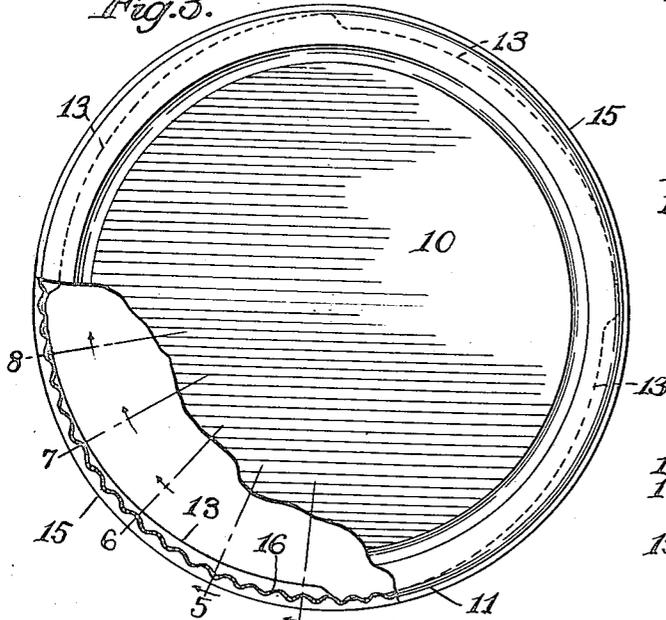


Fig. 6.

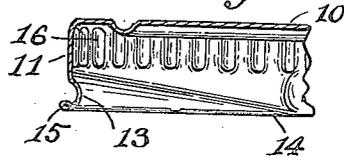


Fig. 7.

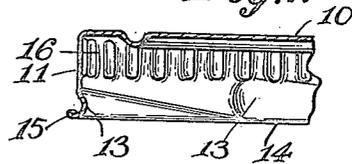


Fig. 8.

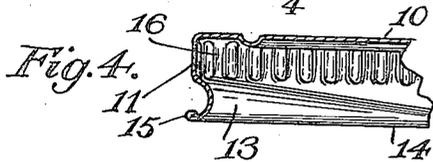
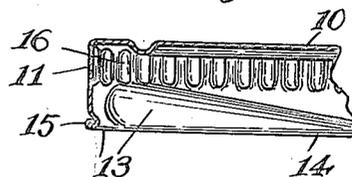


Fig. 4.

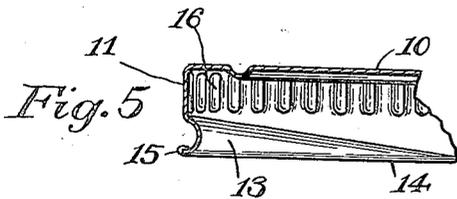


Fig. 5.

Inventor
Charles Hammer
By his Attorney
W. H. Reid.

UNITED STATES PATENT OFFICE.

CHARLES HAMMER, OF QUEENS, NEW YORK, ASSIGNOR TO AMERICAN METAL CAP COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

THREAD JAR CLOSURE.

Application filed May 25, 1921. Serial No. 472,446.

To all whom it may concern:

Be it known that I, CHARLES HAMMER, a citizen of the United States, and a resident of Queens, in the county of Queens and State of New York, have invented certain new and useful Improvements in Thread Jar Closures, of which the following is a specification.

This invention relates to rotatable metal closures particularly adapted for glass containers such as bottles or jars and by means of which the container will be effectively sealed.

One of the objects of this invention is to provide an improved form of locking projections on the closure, that will extend down to and practically form part of the lower marginal portion of the closure flange; and in connection therewith, the raw edge of the flange is formed into a bead or wire edge that will protect this edge of the projection from injurious effects, and at the same time will strengthen and improve the closure.

An object of the invention is the provision of a rotatable metal cap or closure with improved projections so constructed and positioned that they will more quickly engage or catch the projections of the container and have a more extended holding effect thereon and which improved cap can be made of relatively thin sheet metal in a comparatively inexpensive and efficient manner, and yet have a shallow skirt or flange having a strengthened, rolled or curled edge thereby obviating the cutting of the hands of the user and exposure of the cap to acids, moisture and rust and which shallow skirt also has strengthened corrugations which assist in the handling of the cap.

One of the objects of the invention is the provision of projections of wedge or thread-like form which are narrow and shallow at one end and wide and deep toward the rear thereby forming a strengthening arch in cross section and yet each of which notwithstanding it is sufficiently wide at its wide part to take up practically all of the space between the lower margin of the skirt and the corrugations, can be of sufficient length so that its narrow end will terminate adjacent or in close proximity to the wide part of a companion projection, in conse-

quence of which the projections each have a very long helical or inclined upper edge or face and this without materially increasing the depth of the cap flange or skirt, thus insuring a quicker engagement of the bottle or jar projections and a very efficient gripping or binding thread-like surface on the projections, whereby a firmer holding of the cap in position is obtained.

One of the very important improvements is that the present improved construction enables the thread-like projections to practically commence at the lower edge or margin of the skirt, in other words within the bead as it were itself, which bead reinforces and strengthens the projection especially at the entering or starting point of the projection on the jar. This is important because it enables each projection to be turned further on to and also to more quickly engage the thread or lug of the bottle, than is the case where the thread terminates above the bead or strengthened edge of the cap. While at the same time as hereinbefore stated the shallowness of the skirt or flange is still maintained. In other words by reason of certain peculiarities in the manufacture of glass threads of jars or bottles a thread-like projection of the improved form shown herein will more quickly catch and the cap can be turned on to the glass container to a greater extent than was heretofore practicable. In short in the present improved construction by having the lower edge of the projection co-extensive with the lower margin or edge of the skirt and forming the bead within the metal of the thread itself it has been found possible to make the thread-like projection of greater length whereby the important advantages hereinbefore stated are maintained, while at the same time by forming the bead within the metal of the thread, the thread is more efficiently strengthened than is the case where the bead is separate and distinct from the thread, since the thread at its lower edge is of double thickness.

In the accompanying drawing showing one embodiment of my invention, Fig. 1 is a side elevation of the closure on a jar.

Fig. 2 is a perspective view of the same, from a different viewpoint than Fig. 1.

Fig. 3 shows enlarged a plan view, partly in section, on the line 3—3 of Fig. 1.

Figs. 4 to 8 inclusive are partial vertical sections, as indicated by the section lines similarly numbered in Fig. 3.

This invention is in the nature of an improvement of the closure set forth in a patent granted to me November 16, 1915, No. 1,160,596. In that patent projections are shown whose cross-sectional extent increases from one end to the other, and the lower edge of the closure is formed into a bead; but the projections are located beyond and above the bead, although in close proximity thereto throughout its working length, at the lower edge of the projection.

In the present improvement, the flange is indented to provide projections, whose lower portion extends down to and is located in the bottom plane of the closure; and furthermore, the bead that extends around the closure at the bottom, by bending up the raw edge, is itself a part of each projection at its lower portion.

In this art there are two classifications or types of closures or caps that are secured on the container by a turning or screwing operation, which are known in the trade as "lug caps" and as "thread caps". In the latter form, the closure has spiral overlapping threads of considerable length extending circumferentially and overlapping one another to a considerable extent and these threads cooperate with a vessel having either plain lugs of short length, or spiral threads similar to the closure threads, while in the lug type of closures, there is simply a comparatively short lug at intervals on the cap, that are usually parallel with the closure top, or may be given a very slight incline. With such lugs it is necessary that the vessel be provided with spiral threads of considerable length.

In the present improvement by reason of the particular construction and location the projections can be of considerable length without any extended overlapping thereof although the cap has only a shallow flange or skirt.

In the present improvement, I provide a closure formed of a top 10 and a shallow skirt or flange denoted generally by 11, of substantially cylindrical form. The lower portion of the flange is indented at several places, thereby to provide projections that extend inwardly, and four of these projections 13 are shown, but obviously a greater or less number might be provided. Each of these projections, all being identical, is formed of a configuration whose several cross-sections are each in the form of a curve or arc whose chord would be vertical, and the curve extends from the upper part of the projection, first inwardly as well as downwardly, and then outwardly at the lower portion, whereby the lower part of such curve lies in the bottom plane of the closure,

that is denoted by 14. This configuration is similar in each of the sections indicated by Figs. 4 to 8, but the actual size or extent of the curve decreases from a maximum in Fig. 4 on one end of the projection, to a minimum as shown in Fig. 8. This results in the top and bottom portions of each projection diverging, from the smaller end upwardly, so that the upper wall of the projection is in the form of a spiral which varies its distance from the top 10 of the closure.

At the bottom of each projection that is located in the bottom plane 14, the free edge of the flange is bent back on itself to form a comparatively small bead or wire edge 15. This will serve to strengthen the projection, and will also avoid a rough or raw edge, that would injure the hands of the user, and which would be liable to attack by acids and moisture and subject to rust.

As shown, I provide four of these projections or threads 13, that each extends a quadrant distance, so that the small end of one projection is in close proximity to the large end of the next projection, and may merge into the same at the bead. Thus it will be understood that the entire bottom edge of the closure is comprised in a continuous bead 15.

The closure is further strengthened and reinforced by having the flange provided with corrugations 16 at the upper portion above the threads 13. These corrugations may be of any desired arrangement, and are shown in the form of a sinusoid, extending alternately inward and outward. At the upper larger portion of each thread 13, the corrugations are very close to the thread, and a few of them merge into the upper wall of the thread or projections 13.

A thread closure of this character, having the projections or threads extending from the corrugated portion all the way down to the lower plane of cap, is stronger and less yielding than with other constructions where the thread is located above the beaded lower edge, and will serve to form a firmer and tighter seal on the container. Various changes in and modifications of the construction herein set forth may be made without departing from the spirit of this invention or sacrificing its advantages.

Thus I have provided an improved shallow flanged metal cap having wedge formed or thread-like projections so located end to end that they extend circumferentially all around the skirt and yet not materially overlapping each other whereby the projections, beaded edge and corrugations take up practically the whole skirt or flange of the cap and in which the projections as stated are of wedge or thread-like form narrow and shallow at the entering end and wide and deep toward the rear thereof.

It will be observed that in the present im-

proved closure the strengthening or reinforcing bead at the lower edge of the shallow cap flange is formed from the metal of the projection itself so that the lower edge of each projection is co-extensive with the lower edge or margin of the skirt or flange and consequently the lower edge of each projection is of double thickness of metal which not only strengthens and reinforces the projection but does this especially at the entering or narrow end of the projection. Thus it will be apparent that by having the lower edge of the projection co-extensive with the lower edge or margin of the skirt the projection can be made materially longer and the entering end thereof start at the margin of the skirt and so more quickly start on a jar or bottle thread and at the same time have a longer gripping on such jar thread.

It will of course be understood that any form of glass container for which the cap is adapted may be used and it is to be understood that I do not limit myself to the precise construction herein shown and described. In fact where the threadlike projection is made fine enough or the cap flange is made deep enough, the improved projection could extend around the cap flange.

What I claim is:

1. A rotatable metal closure having a top and a depending skirt or flange provided with a plurality of thread-like projections located end to end around the skirt the end of one being in close proximity to the end of another and each having an upper working face continuously inclined in the direction of its length.

2. A rotatable metal closure having a top and a depending skirt or flange provided with a plurality of thread-like projections located end to end around the skirt each having a narrow, shallow entering end and a wide and deep portion depthwise of the flange, the entering end of one projection terminating adjacent to the wide portion of another projection.

3. A rotatable metal closure having a top and a depending skirt or flange provided with one or more thread-like projections each having at the bottom of the thread, its lower edge bent to form a reinforcing bead.

4. A rotatable metal closure having a top and a depending skirt or flange provided depthwise of the flange with a plurality of wedge formed or thread-like projections each starting at the lower margin of the skirt and terminating adjacent to the starting point of a companion projection.

5. A rotatable metal closure having a top and a depending skirt or flange provided depthwise of the flange with a plurality of wedge formed or thread-like projections each starting at the lower margin of the skirt and terminating adjacent to the start-

ing point of a companion projection, and each having its lower edge substantially coinciding with the lower edge of the skirt.

6. A rotatable metal closure having a top and a depending skirt or flange provided with a plurality of wedge formed or thread-like projections each starting at the lower margin of the skirt and terminating adjacent to the starting point of a companion projection, and each having a part of the metal thereof at its lower edge bent to form a reinforcing bead.

7. A rotatable metal closure having a top and a depending skirt or flange provided with a plurality of thread-like projections each having at the bottom of the thread its lower edge bent to form a reinforcing bead, said projections being located end to end around the skirt and terminating the end of one adjacent to the end of the other whereby the skirt has a continuous bead formed practically from the metal of the projections.

8. A rotatable metal closure having a top and a depending flange provided with a wedge formed or threadlike projection formed from the metal of the flange extending from the lower edge upward of said flange and having its upper edge inclined in the direction of its length and its lower edge substantially co-extensive with the lower margin of the skirt.

9. A rotatable metal closure having a top and a depending flange provided with a plurality of wedge formed projections each having its lower edge substantially co-extensive with the lower margin of the skirt, said skirt having a reinforcing bead at its lower edge at the bottom of the projection.

10. a rotatable metal closure having a top and a depending flange provided with a plurality of wedge formed projections each having its lower edge substantially co-extensive with the lower margin of the skirt, said skirt having a reinforcing bead at its lower edge at the bottom of the projections, and also having corrugations between the projections and the top of the closure.

11. A rotatable metal closure having a top and a depending shallow skirt or flange provided with a plurality of wedge formed projections each having its lower edge substantially co-extensive with the lower margin of the skirt, said skirt having a reinforcing bead at said lower edge substantially formed from the metal of the projections and also having reinforcing corrugations between the projections and the top of the closure.

12. A rotatable metal closure having a top and a depending shallow skirt or flange provided with a plurality of wedge formed projections each having its lower edge substantially co-extensive with the lower mar-

gin of the skirt, said skirt having a reinforcing bead at said lower edge substantially formed from the metal of the projections and also having reinforcing corrugations between the projections and the top of the closure, the wider end of each projection filling substantially all of the space between the lower margin of the skirt and the corrugations.

13. A rotatable metal closure having a top and a depending skirt or flange provided with a plurality of wedge formed projections each having its lower edge substantially coinciding with the lower margin of the skirt and each of which projections has its lower edge bent to form a reinforcing bead around the lower edge of the skirt and a series of reinforcing corrugations located between the projections and the top of the closure.

14. A rotatable metal closure having a top and a depending flange provided with a wedge formed or threadlike projection formed from the metal of the flange extending from the lower edge upward of the flange and having a substantial part of the length of its lower edge at the bottom of the projection of double thickness of metal.

15. A rotatable metal closure having a top and a depending flange provided with a plurality of wedge formed projections each having its lower edge at the bottom of the projection of a double thickness of metal thereby forming a bead around the lower edge of the flange of the cap, each of said projections being narrow and shallow at one end and wide and deep toward the rear.

16. A rotatable metal closure having a top and a depending flange provided with a plurality of wedge formed projections each terminating adjacent to the end of a companion projection and each having a substantial part of the length of its lower edge at the bottom of the projection of a double thickness of metal.

17. A rotatable metal closure having a top and a depending flange provided with a plurality of wedge formed projections each terminating adjacent to the end of a companion projection and each having a substantial part of the length of its lower edge of a double thickness of metal, said flange having a series of corrugations located above the projections, the wide parts of the projections substantially spanning the space between the lower edge of the flange and the corrugations.

18. A rotatable metal closure having a top and a depending flange provided with a plurality of wedge formed projections, said flange having a reinforcing bead around the lower edge thereof at the bottom of the projection and each of said projections starting

within said bead and having a wide portion thereof adjacent to the starting point of a companion projection.

19. A screw closure for a container having lugs or threads on the neck, comprising a top and a skirt or flange that is indented to provide a plurality of lug-engaging projections that extend circumferentially at the lower part of the flange, each projection being formed of a cross-sectional configuration that increases in extent from one end portion of the projection towards the other end portion, which configurations have curved contours approximately semi-circular with the lower part of the curved portions located in the bottom plane of the closure, and substantially tangent to such plane, and which projections have the bottom free edge bent to form a comparatively small bead at the bottom of the closure, with the entire bottom edge or margin of the closure included in a continuous bead.

20. A screw closure for a container having lugs or threads on the neck, comprising a top and a skirt or flange that is indented to provide a plurality of lug-engaging projections that extend circumferentially at the lower part of the flange, each projection being formed of a cross-sectional configuration that increases in extent from one end portion of the projection towards the other end portion, which configurations have curved contours approximately semi-circular with the lower part of the curved portions located in the bottom plane of the closure, and substantially tangent to such plane, and which projections have the bottom free edge bent to form a comparatively small bead at the bottom of the closure, with the entire bottom edge or margin of the closure included in a continuous bead, the flange at the upper portion being provided with corrugations that reinforce the closure and some of which corrugations merge into the upper portions of the said projections.

21. A screw closure for a container having lugs or threads on the neck, comprising a top and a skirt or flange that is indented to provide a series of lug-engaging projections that extend circumferentially at the lower part of the flange, each projection being formed of a cross-sectional configuration that increases in extent from one end portion of the projection towards the other end portion, which configurations have curved contours approximately semi-circular with the lower part of the curved portions located in the bottom plane of the closure, and substantially tangent to such plane, and which projections have the bottom free edge bent to form a comparatively small bead at the bottom of the closure, with the entire bottom edge or margin of the closure included in a continuous bead, each projec-

tion being of a quadrant extent with the smaller end of one projection merging into the larger end of the adjacent projection.

22. A screw closure for a container having
 5 lugs or threads on the neck, comprising a top and a skirt or flange that is indented to provide a plurality of lug-engaging projections that extend circumferentially at the lower part of the flange, each projection being
 10 formed of a cross-sectional configuration that increases in extent from one end portion of the projection towards the other end portion, which configurations have the lower portions located in the bottom plane of
 15 the closure, and which projections have the bottom free edge bent to form a comparatively small bead at the bottom of the closure, with the entire bottom edge or margin of the closure included in a continuous bead.
 20 23. A screw closure for a container having lugs or threads on the neck, comprising a top and a skirt or flange that is indented to provide a plurality of lug-engaging projections that extend circumferentially at the
 25 lower part of the flange, each projection being formed of a cross-sectional configuration that increases in extent from one end portion of the projection towards the other end portion, which configurations have the
 30 lower portions located in the bottom plane of the closure, and which projections have the bottom free edge bent to form a com-

paratively small bead at the bottom of the closure, with the entire bottom edge or margin of the closure included in a continuous
 35 bead, the flange at the upper portion being provided with corrugations that reinforce the closure and some of which corrugations merge into the upper portions of the said
 40 projections.

24. A screw closure for a container having lugs or threads on the neck, comprising a top and a skirt or flange that is indented to provide a series of lug-engaging projections that extend circumferentially at the
 45 lower part of the flange, each projection being formed of a cross-sectional configuration that increases in extent from one end portion of the projection towards the other end portion, which configurations have the low-
 50 er part of the curved portions located in the bottom plane of the closure, and which projections have the bottom free edge bent to form a comparatively small bead at the bottom of the closure, with the entire bottom
 55 edge or margin of the closure included in a continuous bead, each projection being of a quadrant extent with the smaller end of one projection merging into the larger end of the adjacent projection.
 60

Signed at New York city, N. Y., on May 18, 1921.

CHARLES HAMMER.