No. 801,282. PATENTED OCT. 10, 1905.

A. L. WEISSENTHANNER.

SHEET METAL STOPPER FOR BOTTLES, JARS, &c.

APPLICATION FILED APR. 8, 1903.

Fig. 1

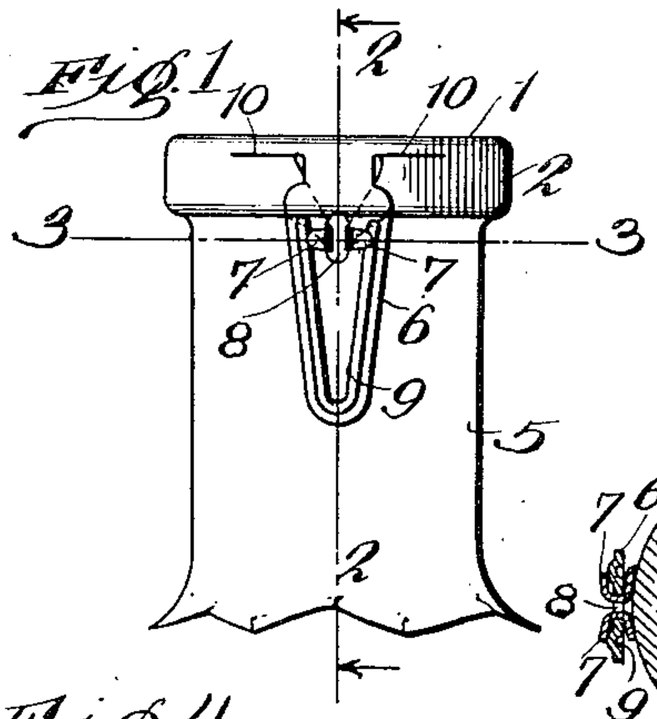


Fig. 2

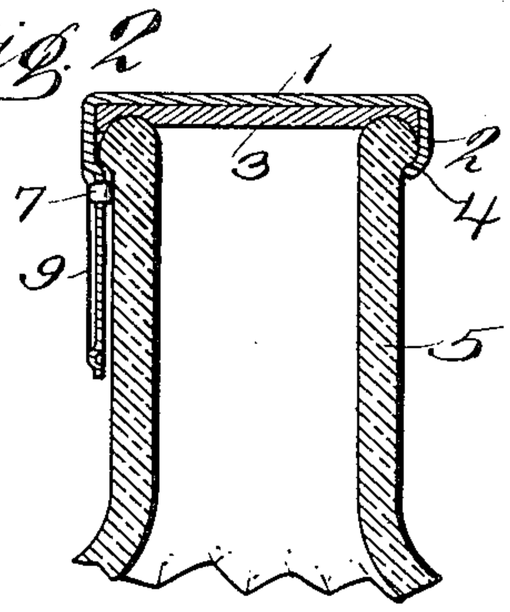


Fig. 3

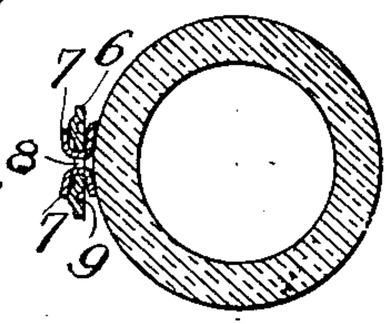


Fig. 4

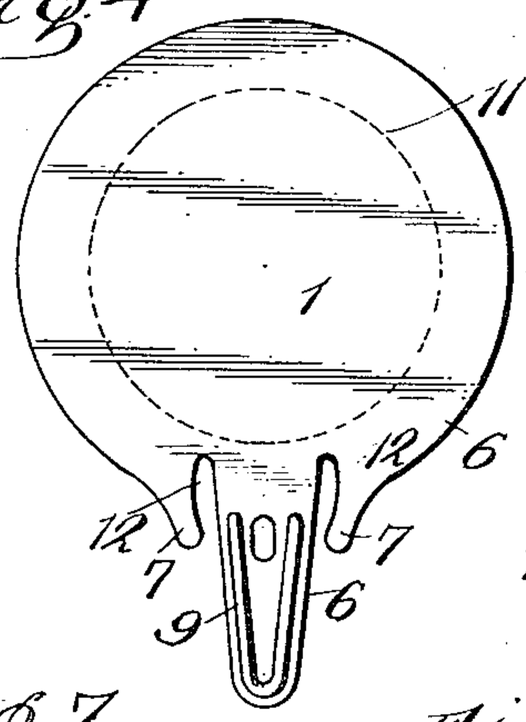


Fig. 5

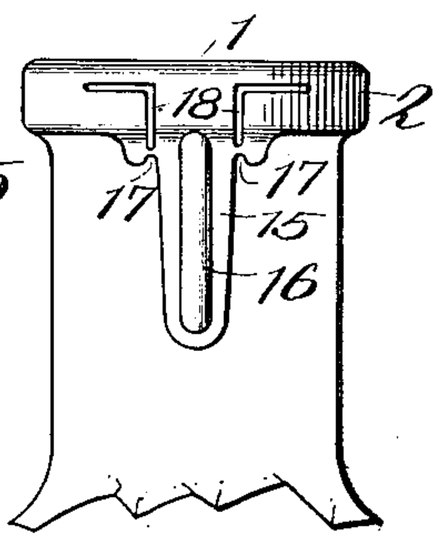


Fig. 8

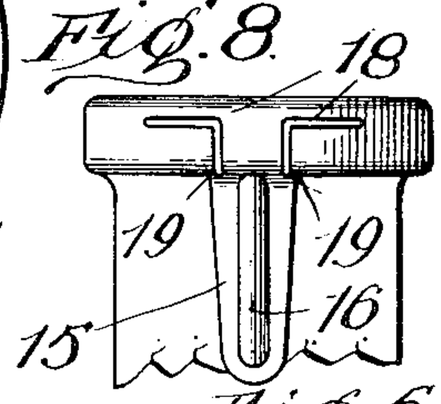


Fig. 6

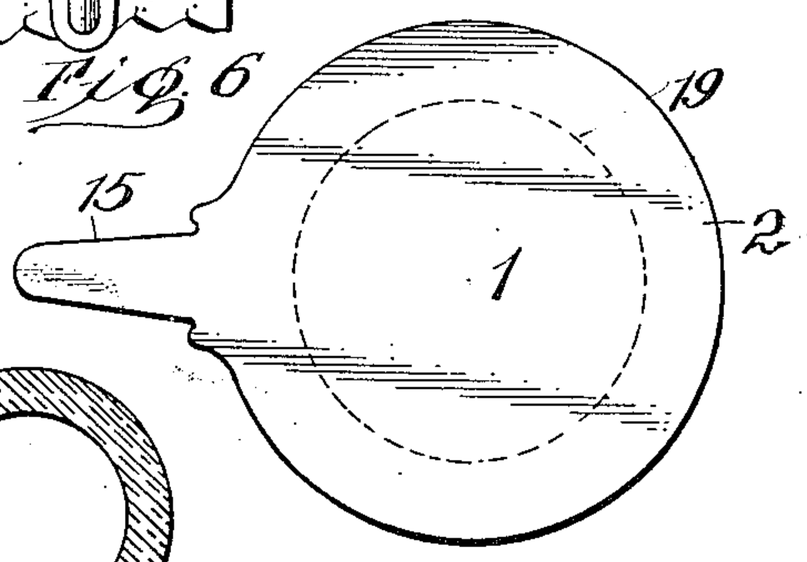


Fig. 7

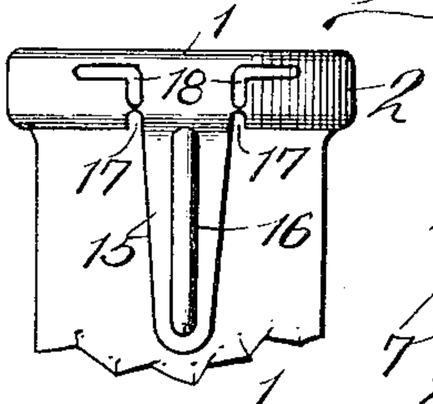


Fig. 10

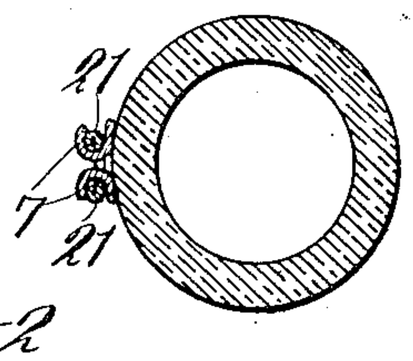


Fig. 9

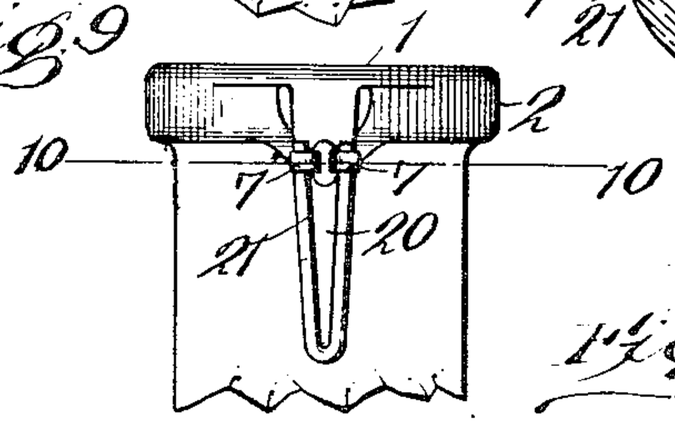
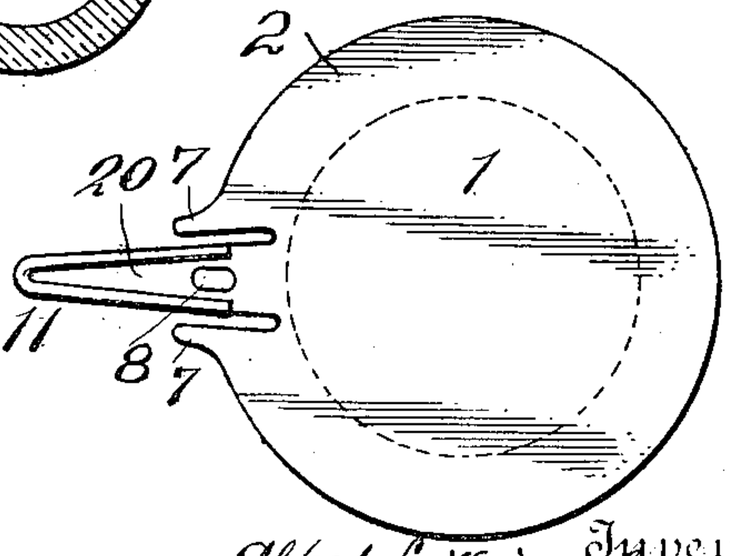


Fig. 11



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UNITED STATES PATENT OFFICE.

ALFRED L. WEISSENTHANNER, OF NEW YORK, N. Y.

SHEET-METAL STOPPER FOR BOTTLES, JARS, &c.

No. 801,282. Specification of Letters Patent. Patented Oct. 10, 1905.

Application filed April 8, 1903. Serial No. 151,573.

To all whom it may concern:

Be it known that I, ALFRED L. WEISSENTHANNER, a citizen of the Republic of France, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Sheet-Metal Stoppers for Bottles, Jars, &c., of which the following is a specification.

This invention relates to sheet-metal stoppers for bottles, jars, &c., and particularly to stoppers having a depending flange inclosing a suitable sealing medium and adapted to be forced into locking relation with a shoulder located near the mouth of the bottle or jar.

As heretofore constructed, stoppers of the class referred to ordinarily required the use of a special opening implement to remove them from the mouth of the bottle. Even where the stoppers have been provided with tongues to facilitate the detaching of the stopper by affording a finger-hold, such stoppers as heretofore constructed cannot be removed by the ordinary user without the use of an implement, especially where the construction is such that the stoppers will retain the contents of the vessel under a considerable pressure, as in the case of beer and carbonated beverages. Where the flanges of the stoppers have been weakened by having their flanges severed or partially severed at one or more points along the circumference, the stoppers cannot be readily removed by means of the tongues as heretofore constructed if the flanges are stiff enough to retain the stopper under pressure. With the object in view of overcoming these difficulties stoppers have been constructed with continuous flanges having detachable connections, the intention being to form the stoppers of sufficiently thin material to enable them to be readily removed when the connected portions of the flange are separated and to so dispose a detaching-tongue that a force applied to the tongue will release the flange and permit the stopper to be removed. These stoppers have failed, however, for two principal reasons. First, in none of the prior devices is the construction such that the flange may be readily released by a pull on the tongue and the detachable connections thereof at the same time strong enough to effectively hold the contents of the vessel under pressure. In the second place, in none of the prior devices is the construction such that the stopper may be readily detached from the bottle, even when the connected portions of the flange are separated.

My invention has for its object to provide a construction whereby the stopper may be readily removed from the vessel by the ordinary user without the aid of an opening instrument and without the exercise of special knowledge or skill.

More specifically, the principal objects of the invention are to provide in a tongued and flanged stopper a construction whereby a comparatively slight force applied to the tongue may release a portion of the flange from the shoulder of the bottle, and where the flange is circumferentially continuous to detach it and release a portion of it from the shoulder of the vessel, so that the stopper may be readily removed from the vessel; also, to provide a construction whereby the operations of releasing and removing the stopper may be quickly performed by a single pull on the tongue.

These and other objects of the invention will more fully appear from the following description.

I have found that by suitably stiffening a detaching-tongue so that when in use it has a lever-like action on the flange to disengage a portion of it from the shoulder of the bottle the stopper may be readily detached. I have found also that by properly disposing such a stiffened tongue with relation to a flange having detachable connections the connections may be made firm enough to hold the stopper securely in place under pressure and yet be readily detached by a comparatively slight force applied to the tongue. I have also found that by weakening the flange of the stopper within the range of action of the tongue and at some point between its line of attachment with the crown of the stopper and the point where it is forced into locking contact with the shoulder of the bottle the stopper may be readily removed by the same operation or a continuation of the same operation which released the flange from the shoulder of the vessel.

The leading characteristics of my invention have been fully set forth in another application, Serial No. 182,832, filed November 27, 1903, in which several embodiments of the invention other than those herein disclosed are shown and described, said application containing claims generic to all embodiments of

the invention shown in both applications and claims specific to forms of stoppers other than those herein shown.

In accordance with one feature of my present invention the stopper is provided with a flange and a stiffened tongue, the tongue being stiffened by ribs or rib-like bends so disposed with relation to the flange that a portion of the flange may be readily disengaged from its locking relation to the shoulder of the vessel. In the best embodiment of this feature of the invention the relation between the stiffened portion of the tongue and the flange is such that the tongue may have a lever-like action on a portion of the flange.

In accordance with another feature of my invention a stopper is provided with detachable connections, and the stiffened tongue is arranged so that the connections may be readily detached and the stopper removed. In accordance with the best embodiment of this feature of the invention the flange is integrally formed with the crown of the stopper, and portions of the flange are detachably connected with the base of the stiffened tongue, the tongue in this construction practically forming a part of the flange.

In accordance with another feature of the invention the flange of the stopper is weakened within the range of the action thereon of the stiffened tongue. In the best embodiment of this feature of the invention the flange is weakened in a circumferential direction adjacent to the tongue on each side thereof. In its best form also portions of the flange adjacent to the tongue are detachably secured together, the tongue being so disposed as to detach said connections and release a portion of the flange from the shoulder of the bottle. The flange is preferably weakened by means of horizontal or circumferential cuts, said cuts being located some distance below the circumferential edge of the crown of the stopper to form a flange portion between said cuts and the crown of the stopper to prevent the giving of the crown by the pressure in the vessel so as to form a leak.

In accordance with the best embodiment of the invention the above features are so combined in a single structure that an outward and upward pull of the tongue will serve both to disengage the detachable connections between portions of the flange and to remove the stopper from the mouth of the bottle.

In the best construction the detachable connections between the portions of the flange of the stopper are located below the shoulder with which the flange is forced into locking contact.

The invention further consists in the novel parts, improvements, and constructions herein described and shown.

In order that my invention may be more readily understood, I have in the accompanying drawings, which are referred to herein and form a part hereof, illustrated several forms of stoppers constructed in accordance with my invention and serving to illustrate the principles thereof.

Of the drawings, Figure 1 is a side elevation of one form of stopper constructed in accordance with my invention, the same being applied to the mouth of a bottle. Fig. 2 is a vertical central section of the same taken on the line 2 2 of Fig. 1. Fig. 3 is a horizontal section taken on the line 3 3 of Fig. 1. Fig. 4 is a plan view of the blank from which the stopper of Fig. 1 is formed. Fig. 5 is a view similar to Fig. 1, illustrating another form of stopper constructed in accordance with my invention. Fig. 6 is a plan view of the blank from which the stopper of Fig. 5 is formed. Figs. 7 and 8 are views similar to that of Fig. 5, illustrating modifications. Figs. 9, 10, and 11 are views similar to those of Figs. 1, 3, and 4, illustrating still another form of stopper constructed in accordance with my invention and the blank from which the same is made, Fig. 10 being taken on the line 10 10 of Fig. 9.

The stopper of Fig. 1 consists of a disk or crown portion 1, having an integral depending flange portion 2 inclosing the disk 3, of suitable packing material, as cork, and adapted to be bent into locking relation with an external shoulder 4, located near the mouth of a bottle 5. In accordance with this form of stopper a detaching-tongue 6 is provided, the same being integrally formed with the crown portion 1 of the stopper and detachably secured to the flange portion 2, preferably by means of a pair of fingers 7, which are integrally formed with the flange 2 and project at their free ends through a suitable opening 8 in the tongue 6 and are bent into locking contact therewith. The tongue 6 may be stiffened by ribs or rib-like bends in any suitable way. In accordance with the construction of Fig. 1 the tongue 6 is stiffened by means of a rib 9. Where the tongue is bent with the flange under the shoulder of the bottle, the rib is preferably terminated at or near the bent portion of the tongue. As shown, the rib is formed adjacent to the periphery of that portion of the tongue which is located below the shoulder of the bottle. In the best construction the ends of the fingers 7 project below the locking-shoulder on the bottle and after being passed through the opening 8 are bent outwardly so that their free ends overlie the rib 9.

By reason of the described construction the stiffened tongue will act as a lever, enabling the portions of the flange adjacent to the tongue to be disengaged from the shoulder of the bottle by a slight force applied to the tongue. At the same time the ends of the fingers 7 may be detached from the opening 8 by comparatively slight force applied to the free end of the tongue, the flange on the stopper being thus detached from the tongue.

This operation is materially facilitated by reason of the fact that the ends of the fingers 7 are not bent at a sharp angle and pressed firmly down onto the flat portion of the tongue. The free ends of the fingers being held away from the tongue by the rib 9, their inner surfaces will be more or less inclined with relation to the opening movement of the tongue, so that the ends of the fingers will be bent outwardly and toward each other by a wedge-like action between the fingers and the opposite wall of the opening in the tongue. For the purpose of rendering the portions of the flange thus disengaged from the tongue ineffective to retain the stopper the metal of the flange is suitably weakened in a circumferential direction adjacent to the tongue. In accordance with the best construction the flange is weakened at each side of the tongue, and the weakening is preferably effected by entirely severing the metal. As shown in Fig. 1, the metal is weakened by forming transverse cuts 10, one on each side of the tongue, said cuts being extended to such length along the circumference of the flange that the portions of the flange between the ends of the cuts and the sides of the bottle may be readily bent out, so as to readily detach the stopper from the mouth of the bottle. In accordance with the best construction also the cuts in the metal are made some distance below the circumference of the crown of the stopper, so as to form a flange portion having sufficient stiffness in a vertical direction to prevent the crown of the stopper from being sprung upwardly by the pressure in the vessel so as to form leaks. To permit the stopper to be easily removed, the weakened portions of the flange are extended through about one-third of its circumference.

The blank from which the stopper of Fig. 1 is formed is illustrated in the plan view, Fig. 4. The boundary-line between the crown portion and the flange portion of the blank is indicated by the dotted line 11. As shown, the tongue portion 6 of the blank is provided with a stiffening-rib 9. Obviously, however, the rib 9 may be formed after the flange has been formed, if desired. As shown, the finger portions 7 of the blank are severed from the tongue 6 by means of substantially radial cuts 12, the fingers 7 being projected to a considerable distance beyond the outer boundary of the flange portion of the blank, so that when the flange is struck up from the blank the fingers will be carried transversely across the rear surface of the tongue 6, ready to be inserted in the opening 8 thereof, said opening being formed a suitable distance below the lower edge of the flange, as shown in Fig. 1.

The blank may be formed by any suitable dies, and the stopper may be shaped up therefrom by any suitable dies. Preferably, however, these operations are accomplished in the manner described in my companion application, the circumferential cuts in the flange being made after the flange is made.

In accordance with the construction illustrated in Fig. 5 the stiffening of the tongue 15 is effected by a single centrally-arranged rib 16, extending from a point near the free end of the tongue to a point opposite the shoulder of the bottle. In accordance with this construction also the connections between the flange of the stopper and the tongue consist of slight necks 17, of metal, the same being formed between notches in the flange adjacent to the tongue and the vertical portions of the weakening-cuts 18 in the flange. The blank from which this form of stopper is made is illustrated in Fig. 6, the dotted line 19 representing the boundary-line between the crown portion 1 and the flange portion 2 of the blank. It will be noted that the tongue portion 15 of this blank is not ribbed and that the flange portion 2 is not provided with the weakening-cuts 18. In this form of stopper the stiffening of the tongue and the weakening of the flange is preferably performed after the flange is formed, as explained in my companion application.

In accordance with the modification illustrated in Fig. 7 the slight necks of metal 17, forming the detachable connections between the flange and the tongue, are located somewhat above the locking-shoulder on the bottle. In this construction, as in those above described, the portions of the tongue which have been curved to conform to the circumference of the bottle-mouth and bent into locking relation with the shoulder on the bottle serve to supplement the stiffening-rib 16, so that the lever-like action of the tongue may be availed of to detach the tongue from the flange.

In accordance with the construction of Fig. 8 the radial portions of the weakening-cuts 18 are terminated just inside of the opposite edges of the tongue 15 and adjacent to or just below the upper end of the stiffening-rib 16 and the lower edge of the flange 2. By reason of this construction the slight necks of metal forming the detachable connections between the flange and the tongue extend in a more or less vertical direction instead of in a horizontal direction, as in the constructions shown in Figs. 5 and 7.

In accordance with the form of the closure illustrated in Figs. 9, 10, and 11 the tongue 20 of the stopper is stiffened by means of a rib formed by a bead or fold 21 in the metal, the same being, as shown, formed around the periphery of the tongue. This bead or fold, as shown, is terminated at a point adjacent to the shoulder on the bottle and extends beneath the free ends of the fingers 7, forming the detachable connections between the flange 2 of the stopper and the stiffened tongue. Except for the construction of the tongue this form of stopper is substantially as that illustrated in Figs. 1 to 4. As illustrated in

Fig. 11, the tongue portion of the blank from which this stopper is formed is preferably provided with the stiffening-bead before the blank is flanged up to form the stopper. Suitable dies for forming this blank are illustrated in my companion application above referred to.

My invention in its broader aspects is not limited to the particular constructions herein shown and described nor to any particular construction by which it has been or may be carried into effect, as many changes may be made in the construction without departing from the main principles of the invention and without sacrificing its chief advantages.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A sheet-metal stopper having a flange and a detaching-tongue, said tongue being stiffened by a rib and so disposed with relation to the flange that a portion of the flange may be readily disengaged from the vessel.

2. A sheet-metal stopper having a flange provided with detachable connections and a detaching-tongue stiffened by a rib and so disposed that said connections may be readily detached.

3. A sheet-metal stopper having a flange and a detaching-tongue, said tongue being stiffened by a rib and detachably secured to a portion of the flange.

4. A sheet-metal stopper having a securing-flange and a detaching-tongue, said tongue being stiffened by a rib and detachably secured to said flange, and said flange being weakened in a circumferential direction adjacent to said tongue.

5. A sheet-metal stopper having a securing-flange and a detaching-tongue, said tongue being stiffened in the direction of its length by a rib and detachably connected to said flange, and said flange being weakened in a circumferential direction adjacent to each side of said tongue.

6. A sheet-metal stopper having a circumferentially-discontinuous securing-flange and a detaching-tongue, said tongue being detachably connected to the adjacent ends of said flange, and said flange being weakened in a circumferential direction adjacent to said tongue.

7. A sheet-metal stopper having a circumferentially-discontinuous securing-flange and a detaching-tongue, said tongue being detachably connected to the adjacent ends of said flange, and said flange being weakened in a circumferential direction adjacent to the opposite sides of said tongue and above the connections between the flange and the tongue.

8. A sheet-metal stopper having a securing-flange and a detaching-tongue, the portion of said tongue projecting below the lower edge of said flange being suitably stiffened in the direction of the length of the tongue by a rib, and connecting means between the tongue and the flange located adjacent to the upper end of the stiffened portion of the tongue.

9. A sheet-metal stopper having a securing-flange and a detaching-tongue, the portion of said tongue projecting below the lower edge of said flange being suitably stiffened in the direction of the length of the tongue by a rib, and connecting means between the tongue and the flange located adjacent to the upper end of the stiffened portion of the tongue, said flange being weakened in a circumferential direction adjacent to said tongue.

10. A sheet-metal stopper having a securing-flange and a stiffened detaching-tongue, and connecting means between the tongue and the flange consisting of fingers on the flange, the free ends of said fingers being bent into contact with the stiffened portion of the tongue.

11. A sheet-metal stopper having a securing-flange and a detaching-tongue and connections between the flange and the tongue consisting of fingers on the flange bent into locking relation with the tongue, said tongue being suitably thickened at the points where it is engaged by said securing means.

12. A sheet-metal stopper having a securing-flange and a detaching-tongue, and detachable connections between said flange and said tongue, said connections consisting of fingers on the flange bent into locking relation with said tongue, the free ends of said fingers being inclined with relation to the detaching movement of said tongue.

13. A sheet-metal stopper having a securing-flange, a detaching-tongue and detachable connections between said flange and tongue, said connections consisting of fingers on the flange adapted to pass through an opening in said tongue, and said tongue being thickened at opposite sides of the opening so as to hold the free ends of the fingers in an inclined position with relation to the plane of the tongue.

14. A sheet-metal stopper having a securing-flange, a detaching-tongue, and detachable connections between said flange and said tongue, said connections consisting of fingers on the flange projecting through a perforation in the tongue, and said tongue being suitably ribbed to stiffen it in the direction of its length, the ribbed portion of the tongue terminating adjacent to and underlying the free ends of said fingers, substantially as described.

15. A capsule for sealing bottles, the edge of which is provided with a strip for bending up or tearing open the capsule, said strip being provided with a rib-like elevation which serves to strengthen the strip.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED L. WEISSENTHANNER.

Witnesses:
J. H. FREEMAN,
EDWIN SEGER.