

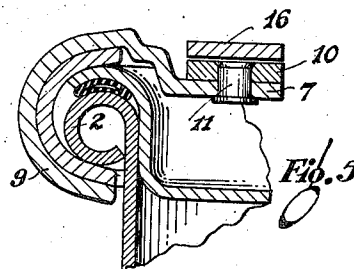
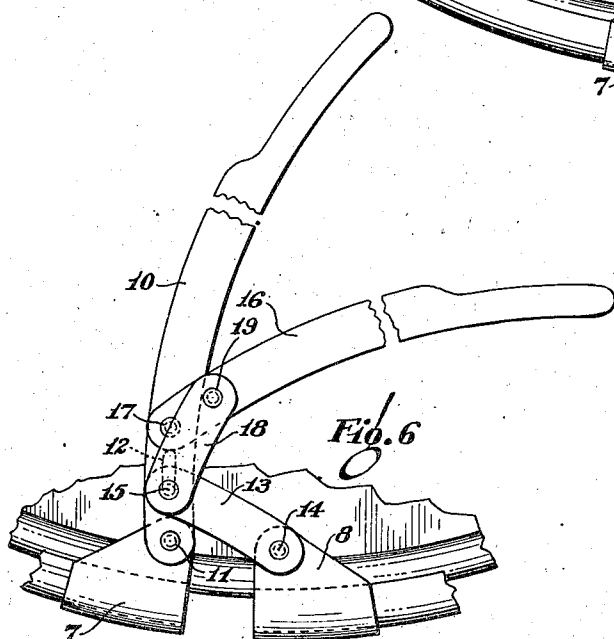
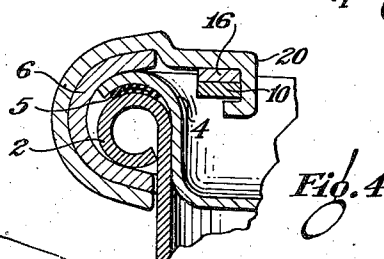
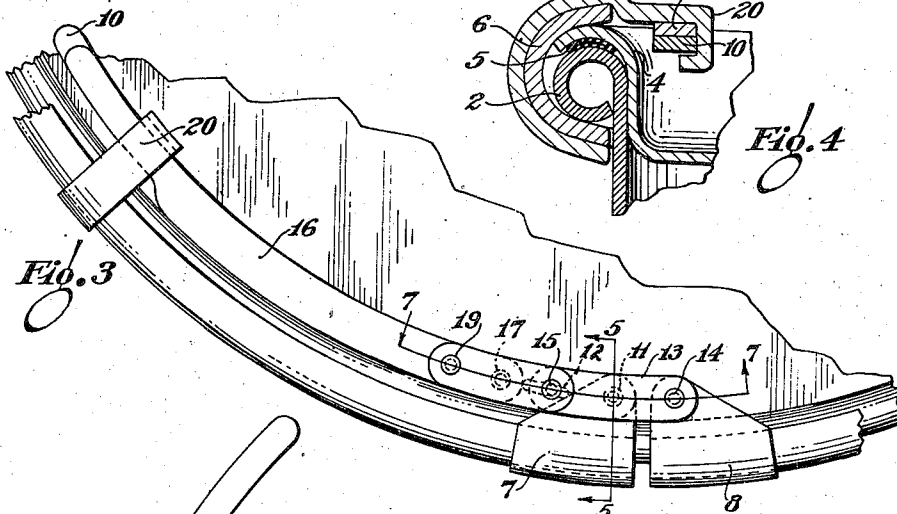
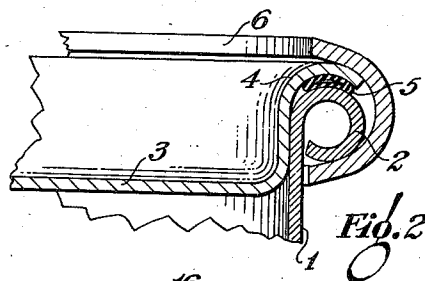
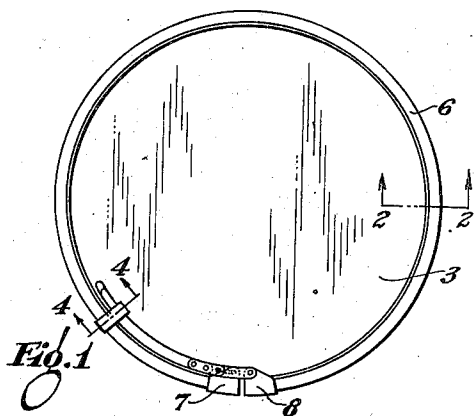
Feb. 15, 1938.

W. LOCKHART
RECEPTACLE AND CLOSURE

2,108,407

Filed May 2, 1935

2 Sheets-Sheet 1



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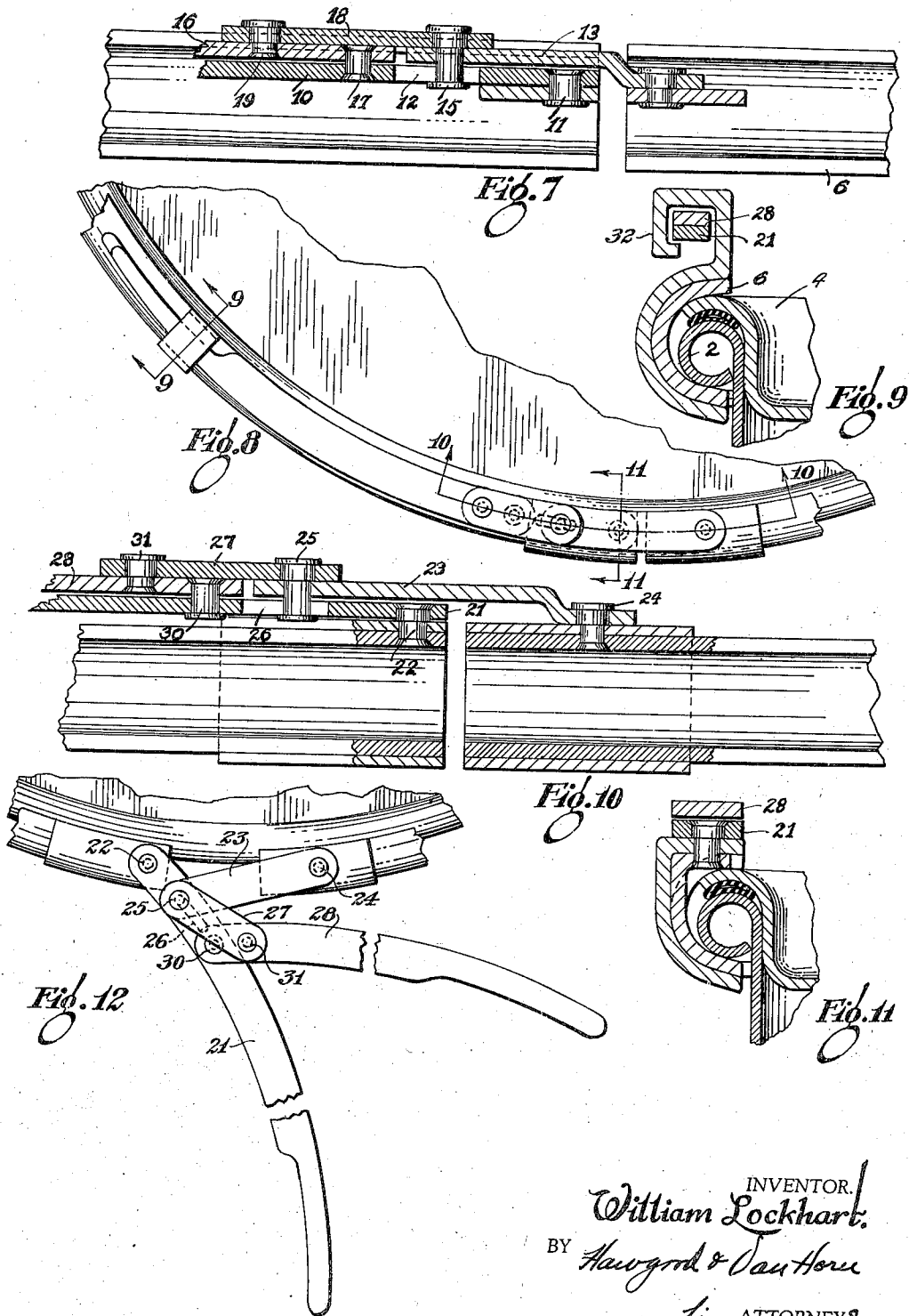
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2 Sheets-Sheet 2



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RECEPTACLE AND CLOSURE

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Application May 2, 1935, Serial No. 19,438

7 Claims. (Cl. 220—61)

My invention is an improvement in metallic receptacles and closures therefor and relates more particularly to a device for removably clamping the cover or closure on the receptacle in fluid tight sealed relation.

One of the objects of my invention is the provision of a split clamping ring having means for expanding or contracting the ring, the said means including a link and lever mechanism connecting the ends of the ring whereby the ring may be contracted to exert a closing pressure on the cover to fix it in place on the receptacle and subsequently to seal the cover by additional pressure in fluid tight sealed relation to the receptacle.

Another object is a ring closing mechanism including a compound link and lever connection between the ends of the ring to apply successive closing and clamping pressures to the cover.

A further object is to increase the ease of operating such devices by providing a primary operating lever and link connection between the ring ends, and a supplemental operating lever pivoted to the primary lever and having a driving connection with said link to further contract the ring to press the cover into fluid tight sealed relation with the open end of the receptacle.

A still further object is to construct a device of the above named character economically.

Other objects and advantages of my invention will become more apparent from the following description of two embodiments of the invention, reference being made to the accompanying drawings in which like reference characters are employed to designate like parts throughout the same.

In the drawings:—

Figure 1 is a top plan view of one embodiment of my invention in which the levers operate entirely within the periphery of the ring. This view shows the device in use to removably clamp a cover on a receptacle in fluid tight sealed relation;

Figure 2 is an enlarged section taken on line 2—2 of Figure 1;

Figure 3 is a fragmentary view of the ring expanding and/or contracting mechanism and shows the ring fully contracted;

Figure 4 is an enlarged section taken on line 4—4 of Figure 1;

Figure 5 is a section taken on line 5—5 of Figure 3;

Figure 6 is a view similar to that shown in Figure 3, but shows the ring expanded and the driving mechanism in open position;

Figure 7 is an elevation taken in the direction of lines 7—7 of Figure 3;

Figures 8 to 12 inclusive illustrate a second embodiment of the invention in which the ring contracting and/or expanding mechanism is connected directly to the ring ends and is arranged to operate outwardly of the ring periphery in expanding the ring;

Figure 8 is a fragmentary view of the second embodiment and shows the operating mechanism in position to fully contract the ring;

Figure 9 is a section taken on line 9—9 of Figure 8;

Figure 10 is an elevation taken in the direction of line 10—10 in Figure 8;

Figure 11 is a section taken on line 11—11 of Figure 8; and,

Figure 12 shows the positions of the links and levers when the ring is expanded.

I will refer first to Figures 1 to 7 inclusive, which are illustrative of one embodiment of my invention. The receptacle or container such as a metal barrel, shipping drum or the like is indicated at 1. The upper open end of the container is formed with a peripheral bead 2. A cover 3 comprising a cupped or depressed head, having a peripheral upwardly and outwardly extending flange 4, is supported by the bead 2 in such a manner that the cupped portion of the head or cover may be telescoped for a short distance within the open end of the drum, as illustrated in Figure 2. It will be noted that a portion of the flange 4 is of substantially arcuate cross section to conform with the approximate curvature of the upper surface of the bead. A packing 5 consisting of an annulus of any suitable packing material, such as flexible rubber tubing or cork, is interposed between the flange 4 and the bead 2.

According to the present invention, I have provided an improved means for removably securing the cover on the drum or receptacle to effect a fluid tight seal therebetween by exerting a substantially uniform and firm pressure along the cover flange and bead in a direction substantially parallel to the longitudinal axis of the drum.

Such means preferably includes a transversely split, channeled clamping ring 6 of substantially U-shaped cross section and which is capable of being expanded and contracted by suitable means. In the form illustrated the upper and lower flange and bead engaging walls respectively of the ring converge slightly toward the outer diameter of the ring and engage the cover flange and bead of the container to press the same together tightly when the ring is contracted. However, it is to

be understood that the ring and receptacle open end may be so designed that the cover will be pressed into a tight seal with a shoulder formed at the receptacle open end when the ring is expanded. That is, instead of the receptacle being

formed with a rolled bead 2, the open end may be formed with an annular shoulder and an annular channel for receiving an expander type ring, a packing ring and the cover.

By contracting the type of clamping ring herein illustrated, the cover flange will be pressed tightly against the packing 5 and the supporting bead 2 under a substantially vertical pressure.

In further carrying out my invention I have provided means connecting the ends of the split ring for contracting and/or expanding the ring as in locking the cover in place or in removing the same. Such means includes a link and lever connection and in describing first one embodiment thereof I will refer to Figures 1 to 7 inclusive of the drawings.

The ends of the ring defining the split are provided with a lug or bracket 7 and 8 extending inwardly of the ring and welded thereto. These lugs also provide reinforcement for the ring ends since it will be seen in Figure 5 that they extend also transversely around the channel as at 9.

An operating lever 10 is pivotally connected at 11 with the lug 7 and is provided with an elongated slot 12 intermediate its ends for purposes which will be more fully described hereinafter. A link 13 which has pivotal connection at one end with the lug 8 as at 14 is connected at its other end with the lever 10 by means of a pin or stud 15 passing through and slidably operable in the slot 12. It will thus be seen that by means of the link and lever connection 13 and 10 the ring may be contracted and expanded easily. When contracting the ring the lever is moved toward the ring circumference or to the left as shown in Figure 3. During such movement the pin 15 will move to the lower end of the slot 12 (Figure 6) and abut the end wall thereof to complete the driving connection. Such contraction of the ring, however, may be sufficient to clamp the cover in place upon the open end of the receptacle as in shipping the receptacles empty, but it may not be sufficient to press the cover and receptacle end together tightly enough to provide a fluid tight seal therebetween. A tight seal of this character is highly desirable in shipping or storing receptacles containing food products, oil or other materials. By means of my invention it is possible to provide such a seal by contracting the ring beyond the degree determined by the link and lever 13 and 10.

To this end I have provided a supplemental or take up connection comprising a supplemental lever 16 pivoted at 17 to the lever 10 and having a driving connection with the link 13 by means of a short supplemental link 18. The link 18 is pivotally connected with the lever 16 at one end as at 19 and with the link 13 at its other end by means of the pin or rivet 15 operating in the slot 12.

Thus it will be seen that, by operating the supplemental lever 16 to the left in Figure 6 to the position in Figure 3 a further contraction of the ring takes place through the driving connection 16, 18 and 13, and the pin 15 will travel toward the upper or other end of the slot 12.

In expanding the ring to remove the cover 3 from the receptacle, the levers 10 and 16 may be oppositely swung independently of each other or simultaneously and when it is desired to fully

expand the ring the lever 10 may be swung further to the right than indicated in Figure 6. In such event the pin 15 will abut the wall defining the lower end of the slot.

I have provided a retainer 20 for the outer ends of the levers 10 and 16' to hold them in ring contracted position as shown in Figures 3 and 4.

Referring now more particularly to Figures 8 to 12 inclusive, I have illustrated a second embodiment of my invention which is similar generally to that form described above, but which differs in its applicability in use.

In this present form, I have avoided the use of lugs on the ring ends by pivotally connecting an end of the lever 21 directly with the reinforced end of the ring on its upper surface at 22. The link 23 is pivotally connected with the other ring end at 24 and with the lever by means of the pin 25 operating in the slot 26 of the lever 21. In this modification it will be noted the ring contracting and/or expanding means is disposed outside the inner circumference of the ring and lies and operates in a plane parallel to and slightly above the transverse plane through the uppermost portion of the ring. The operating levers may thus be swung outwardly of the ring as indicated in Figure 12. This arrangement is more convenient under some conditions and gives the operator more hand room in operating the same.

The link and lever 23 and 21 respectively are employed to contract the ring initially and such degree of contraction may be sufficient in shipping the drums empty. But to obtain an even greater degree of contraction, I have provided a supplemental link and lever 27 and 28 respectively similar to the corresponding parts 16 and 18 shown in Figures 1 to 7 inclusive.

The lever 28 is pivotally connected at one end to the lever 21 as at 30 and is thus carried by the lever 21. The short link 27 is pivotally connected at 31 with the lever 28 and at 25 with the link 23.

The operation of this form of the invention is similar to that of the form previously described, except that the levers swing outwardly of the ring circumference to contract and expand the ring. A suitable retainer 32 is provided to receive and hold the handle ends of the levers 21 and 28 when they are in the position shown in Figure 8.

In operating either form of the invention it will be understood that it is preferable to operate the primary lever 10 or 21 first to initially contract the ring, and then subsequently operate the supplemental lever 16 or 28 increase the closing pressure on the cover. In this manner, a fluid tight seal is easily obtained with little effort on the part of the operator.

The devices may also be operated by swinging the respective levers 10 and 16 or 21 and 28 simultaneously and thereby fully contract the ring in one operation, but this method will require more effort and the closing forces will not be as uniformly distributed around the extent of the ring.

In allowing the ring to expand, as in removing the cover from the receptacle, it is most desirable to first release the lever 16 or 28 and subsequently the lever 10 or 21.

It will be seen from the above description that I have invented a device for removably clamping covers on metallic receptacles in fluid tight sealed relation, which permits first a contraction of the ring to lock the cover in place on the receptacle and which is provided with supplemental means for effecting a further and final contraction of the ring to produce the desired seal.

While I have described the illustrated embodiments of my invention in some particularity, obviously many others will readily occur to those skilled in this art, and I do not, therefore, limit myself to the precise details shown and described but claim as my invention all embodiments, variations and modifications thereof coming within the scope of the appended claims.

I claim:

1. In a clamping device for a metallic receptacle having a bead rolled about its open end and a cover having a flange fitting over the bead, a contractible channeled clamping ring having portions engageable with and pressing the cover flange and bead together when the ring is contracted, and means for contracting the ring including a slotted lever pivotally connected with one end of the ring, a second lever pivoted to said first named lever, and a toggle connecting said levers with the other end of the ring and having a portion operating in the slot of the slotted lever.

2. In a clamping device for a metallic receptacle having a bead rolled about its open end and a cover having a flange fitting over the bead, a contractible channeled clamping ring having portions engageable with and pressing the cover flange and bead together when the ring is contracted, and means for contracting the ring including a lever pivotally connected with one end of the ring, a second lever pivoted to said first named lever, and a toggle connecting said levers with the other end of the ring, said first named lever having a slot therein for slidably receiving a portion of said toggle connection.

3. In a clamping device for a metallic receptacle having a bead rolled about its open end and a cover having a flange fitting over the bead, a contractible channeled clamping ring having portions engageable with and pressing the cover flange and bead together when the ring is contracted, and means for contracting the ring including a slotted lever pivotally connected with one end of the ring, a second lever pivoted to said first named lever, and a toggle connecting said levers with the other end of the ring and having a portion operating in the slot of the slotted lever, said levers pivoted to swing outside the circumference of said ring to contract and/or expand the ring.

4. In a clamping device for a metallic receptacle having a bead rolled about its open end and a cover having a flange fitting over the bead, a contractible channeled clamping ring having

portions engageable with and pressing the cover flange and bead together when the ring is contracted, and means for contracting the ring including a slotted lever pivotally connected with one end of the ring, a second lever pivoted to said first named lever, and a toggle connecting said levers with the other end of the ring and having a portion operating in the slot of the slotted lever, said levers pivoted to swing within the circumference of the ring to contract and/or expand the same.

5. A device for removably clamping a cover on the open end of a receptacle including a split locking ring engaging the cover and a portion of the receptacle to press the same together when the ring is contracted, and means for contracting said ring including a lever pivotally connected with one end of said split ring and operable in but one direction to apply independent contracting forces to the ring, a second lever pivoted to said first lever, and means connecting said levers with the other end of the ring, said connecting means including a pair of links having a sliding driving connection with one of said levers.

6. A device for removably clamping a cover on the open end of a receptacle including a split locking ring engaging the cover and a portion of the receptacle to press the same together when the ring is contracted, and means for contracting said ring including a lever pivotally connected with one end of said split ring and operable in but one direction to apply independent contracting forces to the ring, a second lever pivoted to said first lever, and means connecting said levers with the other end of the ring, said connecting means including a pair of links of unequal length and having a sliding driving connection with one of said levers.

7. A device for removably clamping a cover on the open end of a receptacle including a split locking ring engaging the cover and a portion of the receptacle to press the same together when the ring is contracted, and means for contracting the ring including a lever pivotally connected with one end of said split ring, and a link pivotally connecting said lever with the other end of the ring, said link having a sliding pivotal connection with said lever, and means on said lever to slide said link thereon whereby to exert an additional force for contracting the ring beyond the normal contracting forces applied to the ring when said lever is swung to ring contracting position.

WILLIAM LOCKHART.