

Aug. 2, 1938.

R. CAMPBELL ET AL

2,125,767

FULL REMOVABLE DRUM HEAD CLAMPING RING

Filed March 19, 1935

3 Sheets-Sheet 1

FIG. 1.

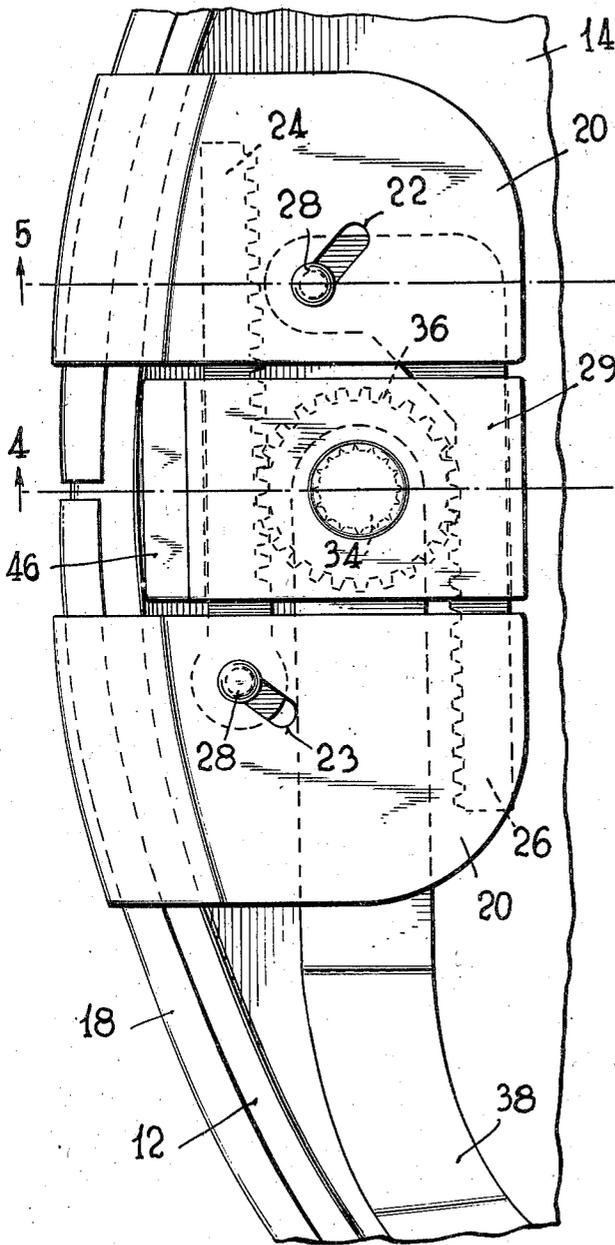


FIG. 2.

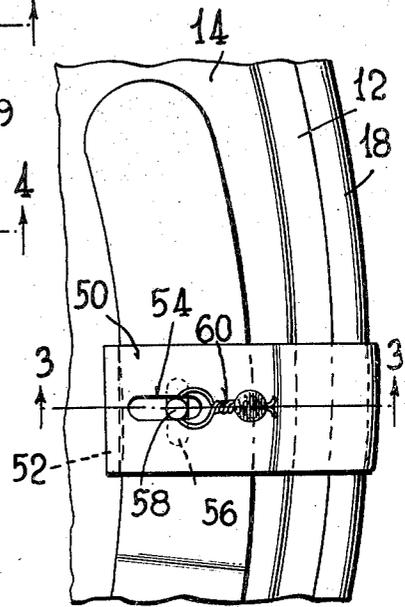
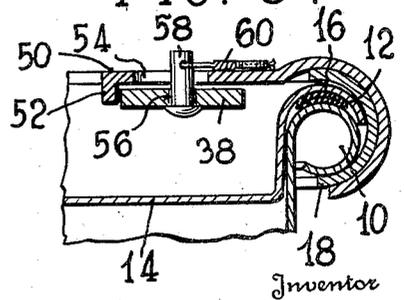


FIG. 3.



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FIG. 4.

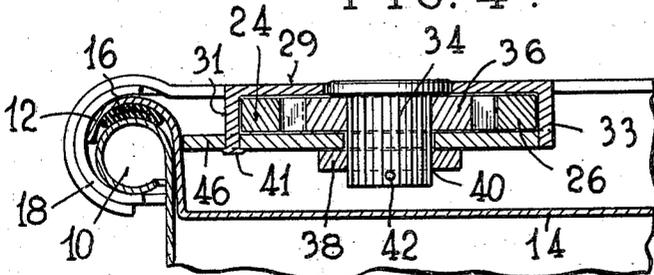


FIG. 5.

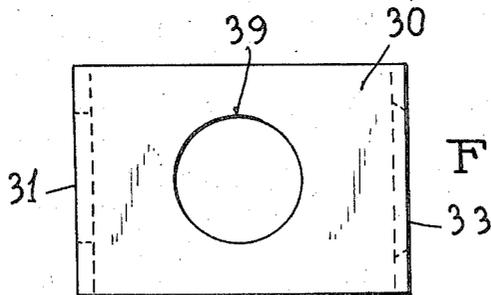
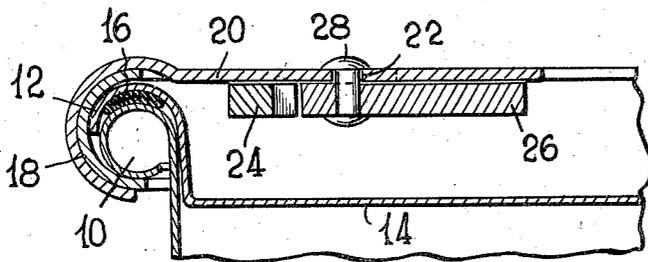


FIG. 6.

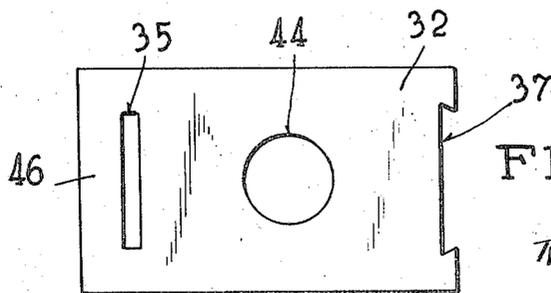


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FIG. 8.

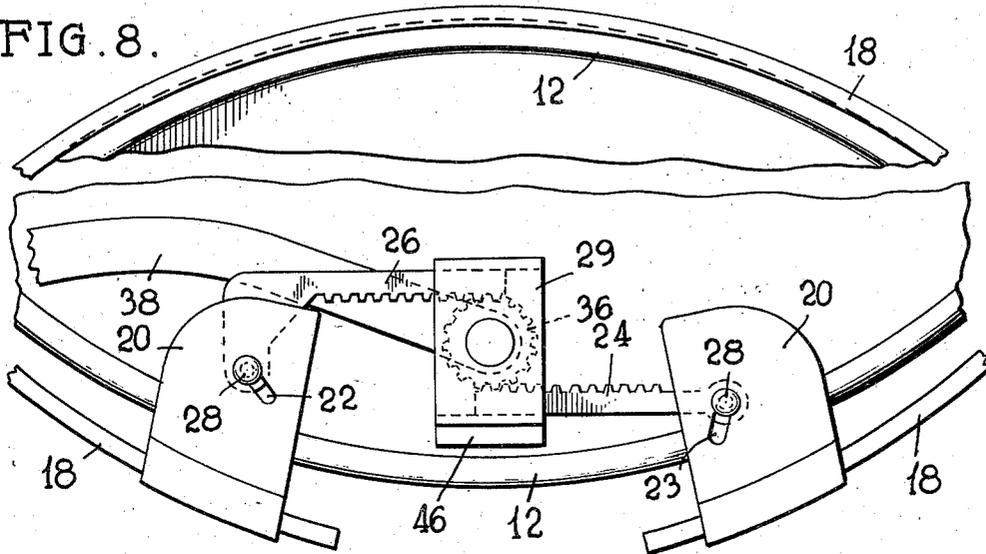
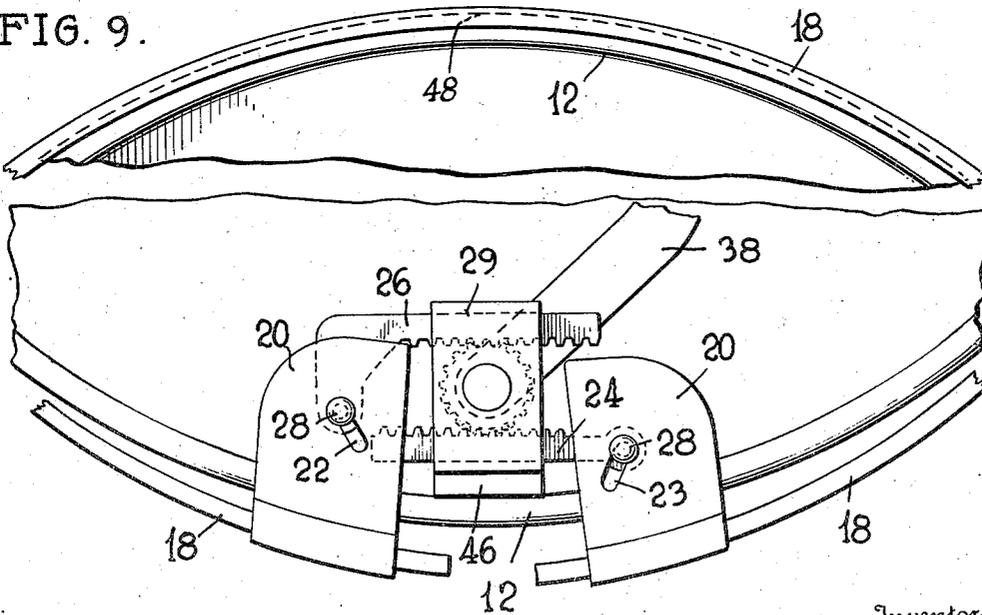


FIG. 9.



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UNITED STATES PATENT OFFICE

2,125,767

FULL REMOVABLE DRUM HEAD CLAMPING RING

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Application March 19, 1935, Serial No. 11,884

12 Claims. (Cl. 220—61)

Our invention relates to open-ended receptacles or drums and has particular reference to mechanism for insuring a fluid-tight seal between the closure member and the open end of the drum.

It is customary, particularly in conjunction with the shipment of fluids such as oil, etc., to provide an open-ended metallic drum having a rolled bead extending around the outer periphery of the open end. A closure member having an outer marginal flange adapted to seat upon the aforesaid bead is positioned over the open end of the drum and some suitable mechanism associated with the drum and drum head assembly for maintaining a fluid-tight seal.

Heretofore it has been quite common practice to use a so-called full removable clamping ring, channeled in cross section, to embrace the drum head flange and drum bead for the purpose of making and maintaining the seal. It is apparent that such a clamping ring must be so designed as to render it easily associated with the drum and drum head assembly. To that end the ring is customarily split and some mechanism provided for connecting the two ends of the ring and drawing the same together tightly about the superposed flange and bead. Heretofore linkage of one type or another, as well as bolts threaded through lugs secured to the ends of the ring, have been used with some degree of success. Such mechanisms for drawing the ring tightly about the bead of the flange, however, possess certain inherent disadvantages, such as a tendency to bind as the ends are drawn together, lack of capacity insofar as adaptability to different sized drum and drum head assemblies is concerned, etc.

A broad object of the invention is to insure ease of placing and removing the ring and to obtain uniform travel of each half thereof, thereby insuring perfect seating around the full circumference and at the same time drawing up the open ends of the ring snugly.

A further object is to eliminate the disadvantages which have been found in other clamping rings and to provide a means for drawing the ring about the drum and drum head assembly which will eliminate all possibility of binding. This object is accomplished by providing a novel ring end drawing means which functions first to seat the ring firmly against the superposed drum bead and head flange at a point diametrically opposite the split ends of the ring and subsequently draws each half or segment of the ring about the drum with a sort of "wrapping" ac-

tion until the entire ring is clamped firmly about the drum.

Still another object of the invention is to provide for a substantial amount of adjustability in the ring end drawing mechanism, thereby enlarging the capacity of the standard ring for use with drum and drum head stock of varying dimensions.

Various other objects of the invention will be apparent from the following description taken in conjunction with the drawings, wherein:

Figure 1 is a plan view of the ring end drawing mechanism, showing the ring in full closed position,

Figure 2 is a plan view of the locking means provided for the operating member of the ring end drawing mechanism,

Figure 3 is a section through line 3—3 of Figure 2,

Figure 4 is a section through line 4—4 of Figure 1,

Figure 5 is a section through line 5—5 of Figure 1,

Figures 6 and 7 are plan views of composite structural elements composing a part of the ring end drawing mechanism, and

Figures 8 and 9 illustrate the operation of the mechanism when the ring is in opened and partially closed position, respectively.

Conventional metallic drums are usually provided with an outer peripheral rolled bead upon which the marginal flange of a drum head is adapted to seat. It is customary to provide a gasket between the drum bead and the drum head flange for the purpose of obtaining a more perfect seal between the drum and its closure member.

A channel-shaped clamping ring is provided at or adjacent its split ends with inwardly extending lugs, which are provided with slots extending diagonally downward toward the split ends of the ring. These lugs may be welded or otherwise secured to the ring, or they may be integral therewith. Rack arms and, respectively, are pivoted in the slots, as by means of rivets. It will be noted that the pivot point of rack is disposed laterally away from and below the pitch line of the rack teeth. This insures an inward pull on its respective ring end as the rack is moved.

A rack and pinion guide, including upper and lower guide plates, receives a knurled stud which projects downwardly through and beyond the lower guide plate. An interiorly broached pinion is mounted upon

the knurled stud between the guide plates **30** and **32** and a locking lever **38** having an interiorly broached opening **40** adjacent one end thereof is positioned over the downwardly extending end of the knurled stud **34**, being retained thereon in some suitable manner, as by means of a pin **42** extending transversely through the lower portion of said stud.

Referring to Figures 4-7, it is to be noted that the upper guide plate **30** is provided with downwardly struck end portions **31** and **33** which are adapted to fit into openings **35** and **37** in the lower guide plate **32**. In assembling the mechanism, pinion **36** is first pressed over the knurled stud **34** and the head of the stud is positioned in opening **39** of the upper guide member. The openings in lower guide plate **32** are then positioned over the downwardly struck ends **31** and **33** of said upper guide member, which ends are peined as illustrated at **41**. As is apparent in Figure 4, the opening **40** in locking lever **38** is pressed over the knurled stud **34**, which extends downwardly through an opening **44** in the lower guide plate. It is to be noted that the lower guide plate is provided with an outwardly extending portion **46**, the function of which will be described more clearly hereafter. The locking racks are next inserted by placing locking lever **38** in wide open position and then moving the lever so that both racks enter the guide simultaneously.

When the ring is in full opened position, ready to be placed over the barrel, the rivet pivots in the racks are forced to the upper ends of the slots **22** and **23**, away from the ends of the split ring as illustrated in Figure 8. Subsequently, as the lever is moved across the face of the drum head to locking position, guide **29** floats toward the inside edge of the head flange until the extension **46** on the lower guide plate abuts said flange. During such movement the ring **10** seats firmly against the drum bead and head flange assembly at a point diametrically opposite the position of the guide. This is clearly illustrated at **48** in Figure 9. During this initial locking movement the ends of the split ring **10** will be drawn tangentially toward one another, but such ends will not be drawn inwardly toward the drum to any substantial extent. The rivet pivots remain at the upper ends of the slots during this movement.

On further movement of the locking lever the two halves or segments of the ring **10** will be progressively "wrapped" snugly around the drum bead and head flange assembly from the point **48** and the ring ends will begin to draw in more rapidly toward the drum, in addition to approaching one another. It will be apparent that guide **29** has now become an anchor by reason of the fact that the extension **46** of the lower guide plate has come to rest against the head flange. Therefore, as illustrated in Figure 1, final movement of the locking lever will tend to draw the ends of the ring inwardly as well as together because the guide is no longer free to float after it has anchored against the drum flange.

On completion of movement of the locking lever the parts will be in the position illustrated in Figure 1, the slots **22** and **23** in the lugs having been drawn along the rivet pivots **28** during the final locking movement as the ends of the ring are drawn up snugly to embrace the drum bead and head flange.

Means are provided for retaining the locking lever in full locked position, such means having been shown for illustrative purposes as constitut-

ing a lug **50** which may be welded or otherwise secured to the ring. This lug is provided with a depending stop flange **52**. The lever **38** is of spring metal and, having been forced under the top flange **52**, will be held in position thereby. A slot **54** is provided in lug **50** with which a corresponding slot **56** in lever **38** is adapted to register when said lever is in full locked position.

To insure against opening of the container or drum during shipment, a pin **58** may be inserted through the registered slots **54** and **56** and wired as indicated at **60**. Often the wire **60**, threaded through the registered slots, is sufficient, it being apparent that this is not intended as an effective locking device and can merely indicate that the contents of the drum have been tampered with during shipment.

By reason of the simultaneous and progressive "wrapping action" of each 180-degree segment of the ring after the same has anchored against the drum at **48**, all binding of the ring as the same is drawn about the closure assembly is eliminated. This easy, effective wrapping action insures rapid placement of the ring in position and locking of the same to insure a fluid-tight seal. By reason of the floating ring end drawing mechanism a ring of given circumference may be opened substantially wider than other rings of the same circumference, thereby insuring ease of handling and adaptability for drum head assemblies of varying sizes.

A further important feature of the invention resides in the adjustability provided by the operating mechanism. It will be apparent that locking arm **38** may be removed from the knurled stud **34** and positioned as desired to provide any arc of swing suitable for the particular drum being closed. Furthermore, the pinion may be rotated with reference to the knurled stud to provide the same sort of adjustability, thereby considerably widening the range or capacity of the clamping ring. Variations in gasket size, furthermore, frequently necessitates such range of adjustability.

It will be noted that an effective closing force is available at all points of the locking lever's swing. This is in contradistinction to the action of the more conventional closing mechanism wherein linkage is operated by a lever for the purpose of drawing the ring ends together. The link type of closure mechanism cannot exert any closing force after the linkage has reached dead center.

While one particular means of rotating the pinion to actuate the ring end drawing racks has been illustrated, it will be apparent that a spring pawl arrangement may be utilized with equal success for this purpose. Having illustrated a preferred form of our improvement, modifications thereof will be obvious to those skilled in the art and for that reason we wish to limit ourselves only within the scope of the appended claims.

What we claim is:

1. In combination with a split clamping ring adapted to embrace the head and flange of an assembled drum and removable drum head, a manually operable assembly pivotally associated with and bodily movable with reference to the ends of the ring and connecting the same operable to first draw the ring firmly against the head and flange at a point diametrically opposite the split portion of the ring and subsequently wrap each half of said ring progressively about the head and flange.

2. In combination with a split clamping ring adapted to embrace the contiguous head and flange of a drum and removable drum head assembly, means within the ring enclosure connecting the ends thereof and movable bodily with reference thereto for drawing the ends together, said means including a member adapted to float against the inner face of the drum head flange and form an anchor for the closing ends.

3. A full removable drum head clamping member comprising a split ring having inwardly extending lugs at the ends thereof, rack arms pivoted to said lugs, a guide member positioned between said lugs slidably receiving said rack arms, a pinion rotatably mounted in said guide in operative relation to said racks, and means for rotating said pinion.

4. In combination with a split ring, ring end drawing mechanism including a pair of arms connected with the ends of said ring through a lost motion connection and means connected with each of said arms operable to draw the same together.

5. A clamping member including in combination a split ring, rack arms pivotally connected with said ring adjacent the ends thereof, and a pinion positioned between said ring ends by said rack arms.

6. A clamping member including in combination a split channeled ring, rack arms pivotally associated with said ring adjacent the ends thereof, a pinion and guide assembly operatively receiving the ends of said rack arms, and means for rotating said pinion to draw said ring ends together.

7. A clamping ring including in combination a split channeled ring, an arm associated with each respective end of said ring, an independent member intermediately disposed with reference to said ring ends adapted to receive said arms, and means associated with said member movable substantially within the plane of the ring and cooperable with said arms for continuously drawing each ring end toward the other with substantially equal increments of movement.

8. In combination with a split clamping ring adapted to embrace the contiguous head and flange of a drum and removable drum head assembly, means within the ring enclosure connecting the ends thereof and movable bodily with reference thereto for drawing the ends together, said means including a member adapted to float against the inner face of the drum head flange and form an anchor for the closing ends during the latter portion of their closing movement and exert pressure on the wall of the cover flange opposite the split in the ring after complete closure.

9. The combination with an open-ended container having a bead extending around the outer periphery of its open end and a removable cover having a marginal flange offset from the plane of the cover seated upon said bead, of a split channeled closure ring adapted to embrace said bead and flange to clamp them together, and means for contracting said ring about said bead and flange including a pair of arms pivotally connected with the ring ends and means operable on the free ends of said arms to draw the ring ends towards one another, said last-mentioned means including a member operable during contraction of the ring to contact the wall

of said flange intermediate the split ends of the ring and exert radial pressure outwardly thereon without relative movement between the contacting parts and to maintain pressure thereagainst after the ring is fully contracted.

10. In combination with a split clamping ring adapted to embrace the head and flange of an assembled drum and removable drum head including a wall offsetting said flange from the plane of the head, a manually operable assembly pivotally associated with and bodily movable with reference to the ends of the ring connecting the same and operable to first draw the ring firmly against the head and flange at a point diametrically opposite the split portion of the ring and subsequently wrap each half of said ring progressively about the head and flange, said assembly including a member operable during contraction of the ring to contact the wall of said flange intermediate the split ends of the ring, and exert radial pressure outwardly thereon without relative movement between the contacting parts and to maintain pressure thereagainst after the ring is fully contracted.

11. The combination with an open-ended container having a bead extending around the outer periphery of its open end and a removable cover having a marginal flange offset from the plane of the cover seated upon said bead, of a split channeled ring adapted to embrace said bead and flange to clamp them together, and means for contracting said ring about said bead and flange, said means comprising arms in pivotal connection with the ends of said ring, a member disposed intermediate the split ends of said ring for receiving the free ends of said arms, means positioned by said member operable to draw said arms towards one another with substantially equal increments of movement, and means associated with said member operable during contraction of the ring to contact the wall of said flange intermediate the split ends of the ring and exert radial pressure outwardly thereon without relative movement between the contacting parts to thereby assist in centering the ring about the drum head assembly and induce simultaneous wrapping action of each 180-degree sector of said ring.

12. The combination with an open-ended container having a bead extending around the outer periphery of its open end and a removable cover having a marginal flange offset from the plane of the cover seated upon said bead, of a split channeled ring adapted to embrace said bead and flange to clamp them together, and means for contracting said ring about said bead and flange, said means including an arm associated with each respective end of said ring, an independent member intermediately disposed with reference to said ring ends adapted to receive said arms, and means associated with said member cooperating with said arms for drawing each ring end toward the other, said member including means operable during contraction of the ring to contact the wall of said flange intermediate the split ends of the ring and exert radial pressure outwardly thereon without substantial relative movement between the contacting parts and to maintain pressure thereagainst after the ring is fully contracted.

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