Aug. 13, 1935. R. S. FETTER 2,011,044

CLOSURE FOR BARRELS

Filed May 11, 1933 3 Sheets-Sheet 1

Fig. 1.

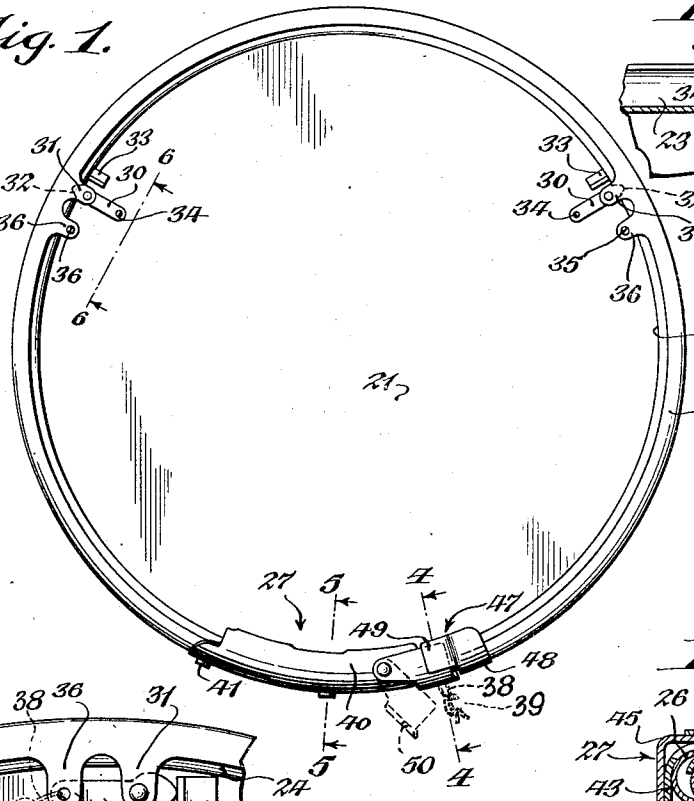


Fig. 6.

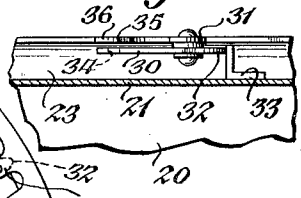
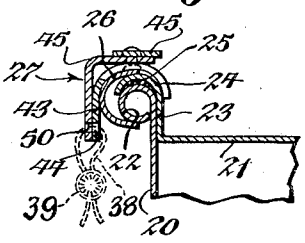


Fig. 4.



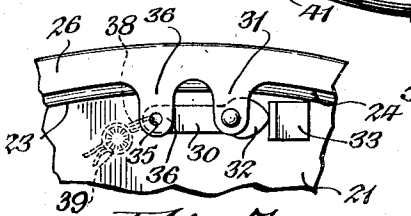
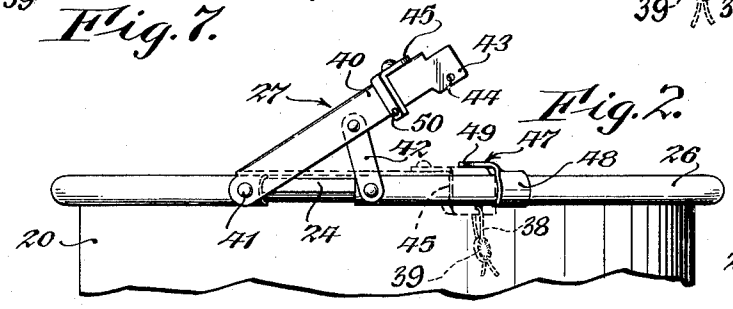


Fig. 7.

Fig. 2.



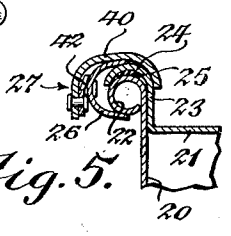
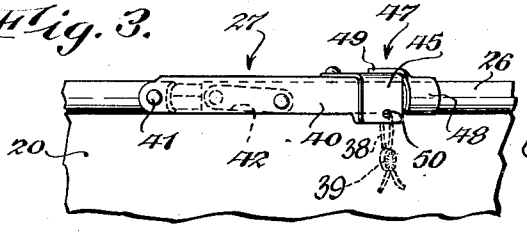


Fig. 5.

Fig. 3.



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Aug. 13, 1935. R. S. FETTER 2,011,044

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Filed May 11, 1933 3 Sheets-Sheet 2

Fig. 8.

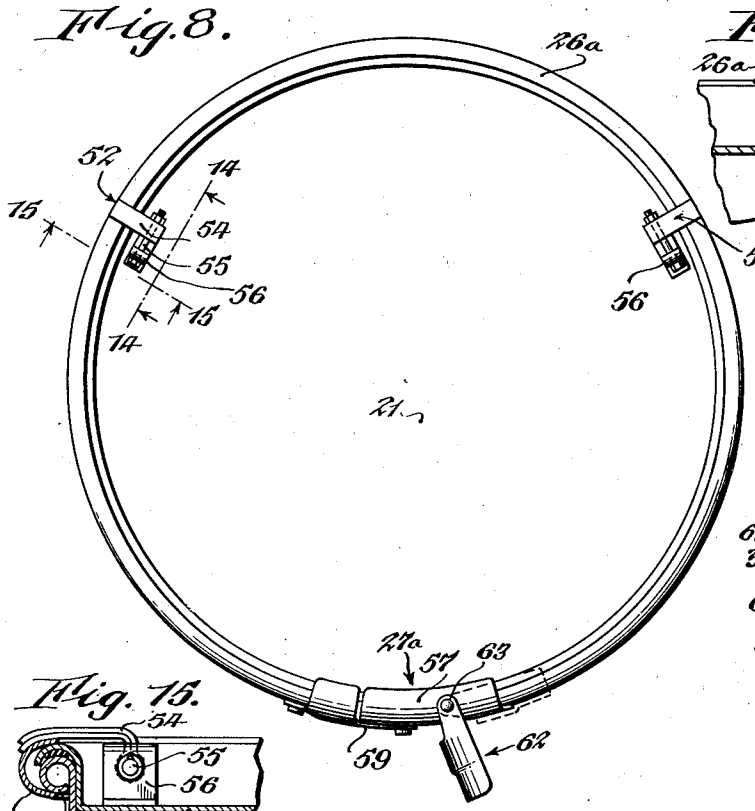


Fig. 14.

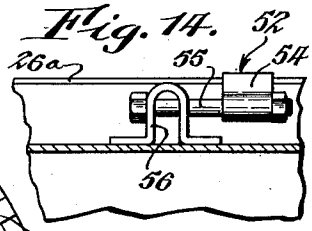


Fig. 11.

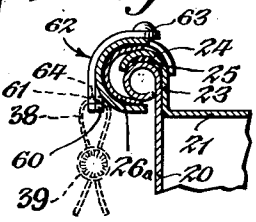


Fig. 15.

Fig. 9.

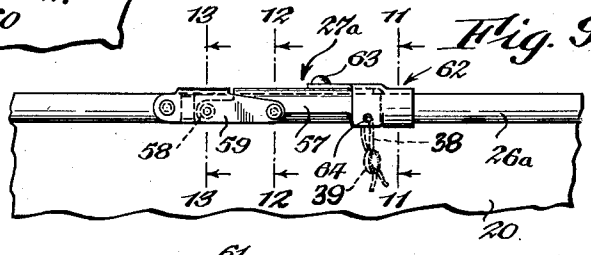


Fig. 12.

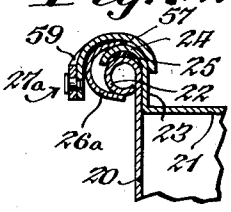


Fig. 10.

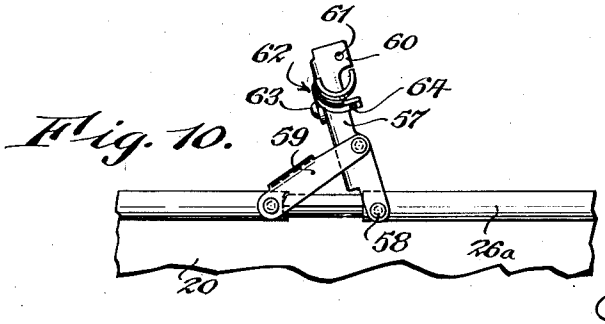
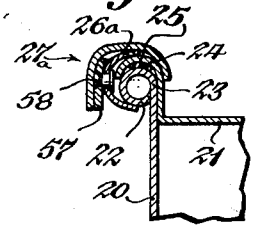


Fig. 13.



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Aug. 13, 1935. R. S. FETTER 2,011,044

CLOSURE FOR BARRELS

Filed May 11, 1933 3 Sheets-Sheet 3

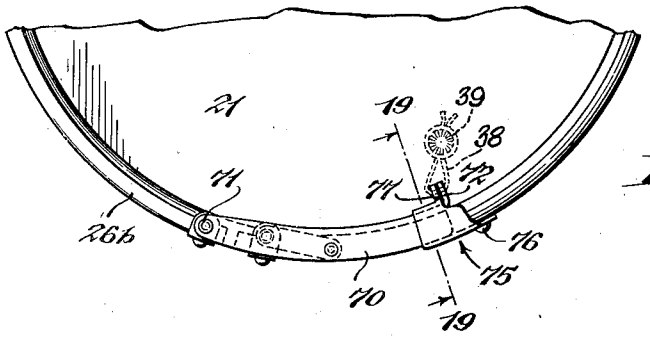
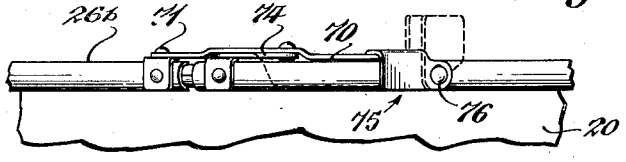


Fig. 16.

Fig. 17.



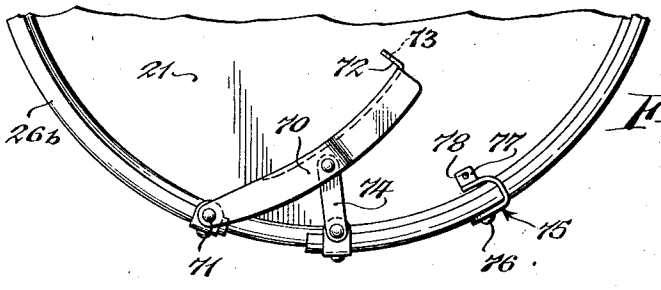


Fig. 18.

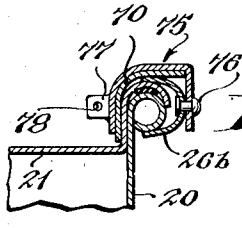


Fig. 19.

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UNITED STATES PATENT OFFICE

2,011,044

CLOSURE FOR BARRELS

Ralph S. Fetter, Buffalo, N. Y.

Application May 11, 1933, Serial No. 670,468

17 Claims. (Cl. 220—61)

This invention relates to a closure for barrels and more particularly to closure means associated with the removable heads of steel drums such as are used in shipping various materials.

Steel drums, such as those to which the present invention relates, are used but once for shipping materials and cannot be used a second time. It is therefore apparent that one of the principal objects in inventions of this character is to reduce the cost of the barrel, head and closure means to a minimum.

A further object is to provide a barrel which is adapted for the transportation of materials which are injured by moisture. It is therefore another object of the present invention to provide a reliable and effective seal between the barrel head and the barrel which insures both against leakage of material from the barrel and also against the entrance of moisture or other contaminating agents.

A further object is to provide such a barrel and closure which is strong and durable and which will withstand the rough handling to which barreled goods are subjected in transit.

Another object is to provide a closure for a barrel which can be quickly and easily applied to a barrel and sealed and latched in position after the barrel is filled and ready for transit and can be as quickly released and the closure opened when the barrel arrives at its destination and its contents are to be emptied.

A further object is to provide a closure which insures that the barrel head is firmly held in engagement with the barrel throughout its diameter so that there is no side at which leakage is liable to occur.

Another purpose is to provide means for sealing the barrel closure by means of the usual wire and lead seals so that if there is any pilfering or adulterating of the contents of the barrel it is immediately detectable and the carrier is enabled to immediately determine the exact place at which the pilfering occurred, thereby increasing the chances of apprehending the parties guilty of the pilfering.

Another object is to provide a split ring closure for securing the head on the barrel in which the ends of the split ring are drawn together about the barrel and its head by a link which provides a powerful leverage in contracting the ring.

Another aim of the present invention is to provide, in combination with such linkage, means for locking the linkage in its closed position and to provide, in combination with such locking means, a seal for preventing unlocking of the locking means without breaking the seal.

Another object of the present invention is to provide, in combination with such a toggle linkage, a lock therefor which is adapted to be sealed by a lead and wire seal, the wire of the seal passing through the lock in such manner that there is no danger of accidentally shearing the wire and destroying the seal.

In the accompanying drawings:

Fig. 1 is a top plan view of a barrel showing a head latched thereon in accordance with my invention and showing the latching means sealed by means of a lead and wire seal.

Fig. 2 is a side elevation thereof showing the linkage of the closure ring in its released position.

Fig. 3 is a fragmentary view similar to Fig. 2 showing the linkage in its latched position with its locking means sealed.

Figs. 4, 5 and 6 are fragmentary vertical sections taken on the correspondingly numbered lines of Fig. 1.

Fig. 7 is a fragmentary enlarged plan view similar to Fig. 1.

Fig. 8 is a view similar to Fig. 1 and showing a modified form of my invention. In this view the linkage is shown in its closed position but the locking means therefor are shown in an unlocked position.

Fig. 9 is a fragmentary side elevation of the form of the invention illustrated in Fig. 8 showing the latching means closed and locked in its closed position.

Fig. 10 is a view similar to Fig. 9 showing the latching linkage in its open position.

Figs. 11, 12 and 13 are vertical sections taken on the correspondingly numbered lines on Fig. 9.

Figs. 14 and 15 are vertical sections taken on the correspondingly numbered lines on Fig. 8.

Fig. 16 is a fragmentary view similar to Figs. 1 and 8 showing a further modification of my invention.

Fig. 17 is a fragmentary side elevation of the form of the invention shown in Fig. 16 and showing the latching means in their closed position and locked.

Fig. 18 is a view similar to Fig. 16 showing the linkage in its open position.

Fig. 19 is a vertical section taken on line 19—19, Fig. 16.

Referring to Figs. 1–5, the numeral 20 represents the usual steel drum or barrel, such as are used in transporting materials and which are generally provided with a permanent closure or head (not shown) at one end while their upper

ends are left open to receive the contents with which they are packed, this open end being subsequently closed by a removable barrel head 21. The open upper end of the barrel is specially formed to receive the removable head 21 and for this purpose is beaded outwardly as indicated at 22. The removable barrel head 21 is also made of sheet metal and is formed at its edge with an upstanding rim 23. The upper edge of this rim 23 is flanged outwardly, as indicated at 24, and this flange 24 is rounded to fit over the bead of the barrel. Between this flange 24 of the barrel head and the bead 22 of the barrel a gasket or seal 25 of rubber or other material is placed so that a moisture-proof and dirt-proof seal is provided between the barrel and head during shipping.

In order to fasten the barrel head in its closed position and in order to press the barrel head firmly against the bead 22 of the barrel and effect a reliable seal, a split ring 26 is placed around the flange and bead of the barrel head and barrel and the ends of this split ring are drawn tightly into engagement with the barrel and head by means of a toggle linkage, indicated generally at 27. The split ring 26 is of inwardly opening channel form and is rounded in cross section, the upper rim of this split ring wedging against the upper face of the flange 25 of the barrel head and the lower rim of this split ring wedging against the under face of the bead 22 of the barrel.

It has been found that where a tight and perfect seal is required between the barrel and the head it is desirable to have means for drawing the split ring into firm engagement with the barrel and the head in addition to the toggle linkage 27. Thus, regardless of how much force may be exerted in drawing the ends of the split ring 26 together the side of the split ring opposite from the split cannot be drawn into the same tight engagement with the barrel and the head as the ends of the ring and this opposite side will be loose to a greater or less degree. This is due to the fact that the friction between the split ring and the barrel shell and head is so great that the split ring cannot be drawn into uniformly tight engagement with the shell and cover its entire extent through pressure exerted at one point only.

To provide a uniformly tight shell at all points around the periphery of the ring two additional tightening levers 30 are pivoted to ears 31 which project inwardly from the split ring 26. These levers 30 are arranged equi-distant from one another and also equi-distant from the ends of the split ring and each of these levers is provided with a cam extension 32, this cam extension engaging a stationary abutment 33 welded or otherwise secured to the top of the barrel head. This abutment is preferably in the form of an L-shaped piece of metal, as best shown in Fig. 6, and each abutment is arranged on the side of the lever 30 remote from the ends of the ring so that upon drawing the levers 30 toward the ends of the ring the cam portion 32 thereof wedges against the abutment 33 and draws the corresponding side of the ring in the direction toward its ends.

Each of the levers 30 is also provided with a hole 34 which is adapted to register with a corresponding hole 35 of another ear 33 of the split ring 26 so that when the levers 30 are in latched position the holes 34 and 35 register and can receive a sealing wire 38, which is threaded through these holes and has its ends joined by the usual lead seal 39.

The toggle linkage 27 comprises a long lever 40 which is pivoted as at 41 at one end to one of the ends of the split ring 26 and at its center is connected to the other end of the split ring 26 by a link 42. This lever 40 is of channel form so as to fit around the channel shaped ring 26 and its free end is provided with a downward extension 43 having a hole 44 adapted to receive a sealing wire 38 and lead seal 39. On the upper side of the free end of the lever 40 is also pivoted an L-shaped lock 45, the pivotal connection 46 for this lock extending through the upper leg of this lock and securing it to the upper side of the lever 40. This lock 45 cooperates with a catch 47 which is permanently secured to that end of the split ring 26 to which the ring 42 is connected. This catch comprises a rounding portion 48 which is fitted and secured to the outside of the split ring 26 and an upwardly offset catch portion 49 under which the lock 45 is adapted to swing.

From the foregoing it is apparent that after the levers 30 have been moved to draw the center of the split ring into engagement with the barrel and its head the ends of the split ring are drawn together by swinging the lever 40 downwardly, this downward movement of the lever forcing the link 42 toward the pivot 41. When the lever 40 is forced downwardly to its latched position, shown in Fig. 3, it embraces and conceals the link 42 and the ends of the split ring 26. When the lever 40 is in its closed position, the L-shaped lock 45 can be swung to its locked position under the catch portion 49 of the catch 47. In this position a hole 50 in the lock 45 registers with the hole 44 in the lever 40 and a sealing wire 38 can be drawn through these registering holes and the ends of the wire 38 sealed with a lead seal 39 in the usual manner.

In the form of the invention shown in Figs. 8–15 a different form of toggle linkage 27*a* is provided for drawing the ends of the split ring together and instead of the levers 30 a screw tightening means are provided for drawing the side of the split ring opposite to its ends into firm engagement with the barrel and head. Two of these screw tighteners, indicated generally at 52, are provided, these being equi-distant from one another and from the toggle linkage 27*a*. Each of the tighteners 52 consists of an ear 54 welded or otherwise secured to the ring 26*a* and projecting inwardly therefrom. A bolt 55 passes through this ear and also through an ear 56 which is welded or otherwise suitably secured to the top of the barrel head. The ear 56 of each of the auxiliary tighteners 52 is arranged on the side of the ear 54 nearest the ends of the ring so that tightening the bolt 55 draws the adjacent part of the ring toward its ends.

The modified form of toggle linkage 27*a*, shown in Figs. 8–15, comprises a lever 57 pivotally secured, as indicated at 58, to one end of the split ring 26*a* and being formed in cross section to swing down over and to fit around that end of the split ring to which it is secured. A link 59 connects the center portion of the lever 57 with the opposite end of the split ring 26*a* and this link is formed to fit around and cover the ends of the split ring 26*a* when the lever 57 is forced down into its latched position. The free end of the lever 57 is provided with a downward extension 60 having an opening 61 adapted to receive a sealing wire. This lever 57, at its free end, also car-

ries a lock 62 which is pivoted to the upper side of the lever 57, as indicated at 63, so that the lock swings horizontally. The free end of the lock 62, as best shown in Figs. 8, 10 and 11 is of channel form in cross section and is adapted to embrace the corresponding part of the split ring 26a. Between this channel shaped end of the lock 62 and its pivotal mounting, this lock is provided with a downward extension having a hole 64 which is adapted to register with the hole 61 in the lever 57. A sealing wire 38 with a lead seal 39 can be passed through these holes.

It is apparent that with this form of the invention the ends of the locking ring are drawn and latched together by swinging the lever 57 downwardly and then swinging the lock 62 horizontally so as to embrace the split ring 26a so as to prevent an accidental return upward movement of the lever 57. The downward movement of the lever, of course, through its toggle link 59 exerts a powerful force in drawing the ends of the split ring 26a together.

In the form of the invention shown in Figs. 16–19 a further modified form is shown of the toggle linkage for drawing the ends of the split ring together and latching the ring in its contracted condition about the barrel head and barrel. As there shown, a lever 70 is pivoted at 71 to one end of the splint ring 26b so as to swing horizontally inward. This lever is of L-shaped form in cross section and when swung outwardly fits over the ends of the split ring 26b. At its extreme end this lever is provided with an inwardly projecting ear 72 having a hole 73 adapted to receive the sealing wire 38. The central portion of this lever 70 is connected by a link 74 with the opposite end of the split ring 26b and to this opposite end is also secured a lock 75. This lock is pivotally secured as at 76 so as to swing vertically and this lock is of channel form in cross section so that when it is swung down it embraces both the free end of the lever 70 and the split ring 26b so as to prevent an accidental return inward movement of the lever 70. On its inner side this lock 75 is provided with an ear 77 having a hole 78 and this ear is adapted to fit against that side of the ear 72 on the lever 70 which faces the pivot 71. The sealing wire 38 passing through the holes 73 and 78, of course, seals the linkage in its locked condition.

With the form of the invention shown in Figs. 16–19 it is apparent that upon swinging the lever 70 outwardly its toggle link 74 is moved so that the ends of the split ring 26b are drawn together. When the lever 70 has been drawn to its position in which it is arranged against the side of the split ring, as shown in Fig. 16, the lock 75 can be swung downwardly so as to embrace the free end of the lever 70 and the split ring 26b and prevent the return movement of the lever 70. The sealing wire 38 can then be passed through the registering openings in the ears 72 and 77 and the toggle linkage sealed against pilfering.

From the foregoing it is apparent that the present invention provides a very simple and inexpensive barrel head construction in which latching means between the head and barrel are provided at at least three places, these latching means insuring that the head is tightly pressed against the barrel at all places around its periphery, thereby avoiding leakage of the contents or contamination of the contents. The invention also provides a construction which is extremely easy to set up and also permits the cover to be quickly and easily removed when it is desired to remove the contents. The construction of the barrel head and the latching means are also strong and durable and will stand up under the severe handling conditions which obtain in transporting barreled goods. The latching means are also easily and quickly sealed to render pilfering of the contents of the barrel instantly detectable.

I claim as my invention:

1. The combination of a barrel shell having a beaded mouth and a head having a rim fitting over said bead, a split ring formed to embrace said bead and rim, means movable from an open to a closed position and in so moving forcing the ends of said split ring circumferentially to force said ring into firm engagement with said bead and rim, and a latch permanently carried by said ring and movable to a position embracing said ring and last named means to hold said last named means in said closed position.

2. The combination of a barrel shell having a beaded mouth and a head having a rim fitting over said bead, a split ring formed to embrace said bead and rim, means movable from an open to a closed position and in so moving forcing the ends of said split ring circumferentially to force said ring into firm engagement with said bead and rim, and locking means permanently connected to one of said last two elements and movable to a position embracing said two elements to hold said movable means in said closed position.

3. The combination of a barrel shell having a beaded mouth and a head having a rim fitting over said bead, a split ring formed to embrace said bead and rim, means movable from an open to a closed position and in so moving forcing the ends of said split ring circumferentially to force said ring into firm engagement with said bead and rim, and locking means pivotally connected to one of said last two elements and movable to a position embracing said two elements to hold said ring moving means in said closed position.

4. The combination of a barrel shell having a beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, a toggle linkage movable from an open to a closed position and in so moving forcing the ends of said ring circumferentially to force said ring into firm engagement with said bead and flange and locking means permanently carried by said ring and movable across said toggle linkage transversely of the line of movement of said linkage to hold said toggle linkage in an operative position and one of said toggle members overlapping the joint between the ends of said ring when moved to said closed position.

5. The combination of a barrel shell having a beaded mouth and a head having a flange fitting over said bead, a split ring member formed to embrace said bead and flange, toggle linkage members movable from an open to a closed position and in so moving forcing the ends of said ring circumferentially to force said ring into firm engagement with said bead and flange, a locking element, and a permanent pivotal connection between said locking element and one of said members whereby said locking element is movable across said toggle linkage transversely of the line of movement of said toggle linkage to embrace said toggle linkage and ring and to hold said toggle linkage in said closed position.

6. The combination of a barrel shell having an outwardly beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, a lever pivotally

secured to one end of said ring, a link pivotally connected to the central part of said lever and pivotally connected to the other end of said ring, said lever and link forming a toggle linkage adapted to draw the ends of said split ring together and a locking member pivotally mounted on the free end of said lever, said locking member being turnable to engage a part of said ring and prevent return movement of said linkage when said ring is contracted.

7. The combination of a barrel shell having an outwardly beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, a lever pivotally secured to one end of said ring, a link pivotally connected to the central part of said lever and pivotally connected to the other end of said ring, said lever and link forming a toggle linkage adapted to draw the ends of said split ring together, a locking member pivotally mounted on the free end of said lever, a catch secured to that end of said ring connected to said link, said locking member being turnable to engage said catch and prevent return movement of said linkage when said ring is contracted, and an extension on said locking member having a hole adapted to register with a hole in said lever, said holes being adapted to receive a sealing wire or the like.

8. The combination of a barrel shell having an outwardly beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, a lever pivoted to one side and at one end of said ring to swing parallel with the axis of the barrel, a link similarly pivoted to the central part of said lever and the other end of said ring, said link and lever forming a toggle linkage adapted to draw the ends of said ring together with the lever overlapping said link and the joint between the ends of said ring, a catch secured to that end of said ring which is connected to said link and projecting toward said linkage, a locking member pivotally secured to said lever to swing transversely of the axis of said barrel under said catch to prevent return movement of said lever after said ring has been contracted and a downward extension on said locking member, said downward extension being arranged alongside said lever when said locking member is in engagement with said catch and said downward extension and the side of said lever being provided with registering holes adapted to receive a sealing wire or the like.

9. The combination of a barrel shell having an outwardly beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, a lever pivotally secured to one end of said ring, a link pivotally connected to the central part of said lever and pivotally connected to the other end of said ring, said lever and link forming a toggle linkage adapted to draw the ends of said split ring together, a pivoted locking member connecting with said lever and movable to embrace said ring to prevent return movement of said lever after said ring has been contracted.

10. The combination of a barrel shell having an outwardly beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, a lever pivotally secured to one end of said ring, a link pivotally connected to the central part of said lever and pivotally connected to the other end of said ring, said lever and link forming a toggle linkage adapted to draw the ends of said split ring together, a locking member pivoted to said lever to swing transversely to its line of movement and having a free end adapted to engage one side of said ring to prevent return movement of said lever after said ring has been contracted.

11. The combination of a barrel shell having an outwardly beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, a lever pivoted to one side and at one end of said ring to swing parallel with the axis of the barrel, a link similarly pivoted to the central part of said lever and the other end of said ring, said link and lever forming a toggle linkage adapted to draw the ends of said ring together with the lever arranged alongside said link and the joint between the ends of said ring, and a locking member pivoted to the free end of said lever to swing transversely to its line of movement, said locking member being formed to engage under the clamping ring and prevent return movement of said lever after said ring has been contracted and said locking member and lever being provided with registering openings adapted to receive a sealing wire or the like.

12. The combination of a barrel shell having an outwardly beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said flange and bead, a lever pivoted to one end of said ring, a link connected to the central part of said lever and pivotally connected to the other end of said ring, said lever and link forming a toggle linkage adapted to draw the ends of said ring together, and a locking member pivotally connected to that end of said ring which is pivotally connected to said link, said locking member swinging into engagement with said lever and preventing its return movement after said ring has been contracted.

13. The combination of a barrel shell having an outwardly beaded mouth, and a head having a flange fitting over said bead, a split ring formed to embrace said flange and bead, a lever pivoted to one end of said ring to swing horizontally inward toward the center of said barrel, a link similarly pivoted to the central part of said lever and the other end of said ring, said link and lever forming a toggle linkage to draw the ends of said ring together, a locking member pivoted to that end of said ring which is pivotally connected to said link and swinging parallel with the axis of said barrel, said locking member engaging and preventing the return inward movement of said lever after said ring has been contracted and registering apertured ears on said locking member and lever to receive a sealing wire or the like.

14. The combination of a barrel shell having a beaded mouth and a head having a flange fitting over said bead, a single continuous ring formed to embrace said bead and flange and split crosswise at one point only to provide an unbroken belly therein, means for moving the ends of said split ring circumferentially to force the corresponding part of said ring into firm engagement with said bead and rim and means at the unbroken belly of said ring to draw the belly of said ring circumferentially into firm engagement with said flange and bead.

15. The combination of a barrel shell having a beaded mouth and a head having a flange fitting over said bead, a single continuous ring formed to embrace said bead and flange and split crosswise at one point only to provide an unbroken belly therein, means for moving the ends of said split ring circumferentially to force the corre-

sponding part of said ring into firm engagement with said bead and rim and cooperating wedge means between said head and ring and arranged at spaced intervals at the unbroken belly of said ring for drawing the belly of said ring circumferentially into firm engagement with said bead and flange.

16. The combination of a barrel shell having a beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, means for moving the ends of said split ring circumferentially to force the corresponding part of said ring into firm engagement with said bead and rim and cooperating wedge means between said head and ring and arranged at spaced intervals at the side of said ring opposite from its ends for drawing the adjacent part of said ring circumferentially into firm engagement with said bead and flange each of said wedge means comprising an abutment on said head and a lever pivotally mounted on said ring and having a cam extension adapted to engage said abutment.

17. The combination of a barrel shell having a beaded mouth and a head having a flange fitting over said bead, a split ring formed to embrace said bead and flange, means for moving the ends of said split ring circumferentially to force the corresponding part of said ring into firm engagement with said bead and ring and cooperating wedge means between said head and ring and arranged at spaced intervals at the side of said ring opposite from its ends for drawing the adjacent part of said ring circumferentially into firm engagement with said bead and flange each of said wedge means comprising an ear on said head, an ear on said ring and screw means connecting and drawing said ears together.

RALPH S. FETTER.