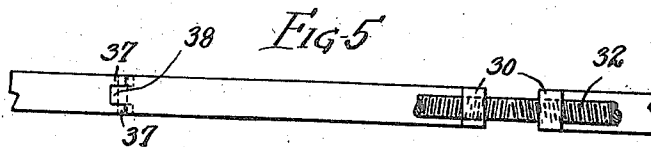
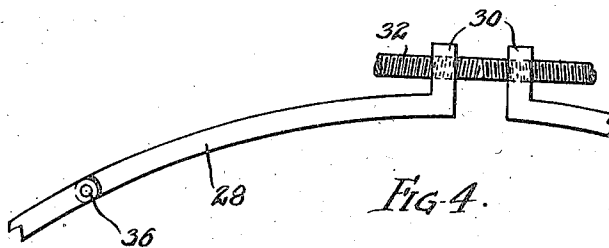
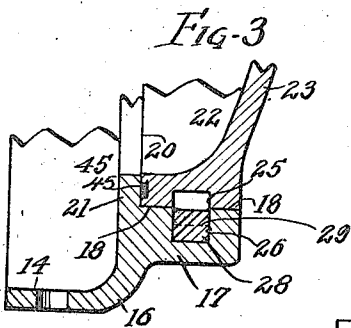
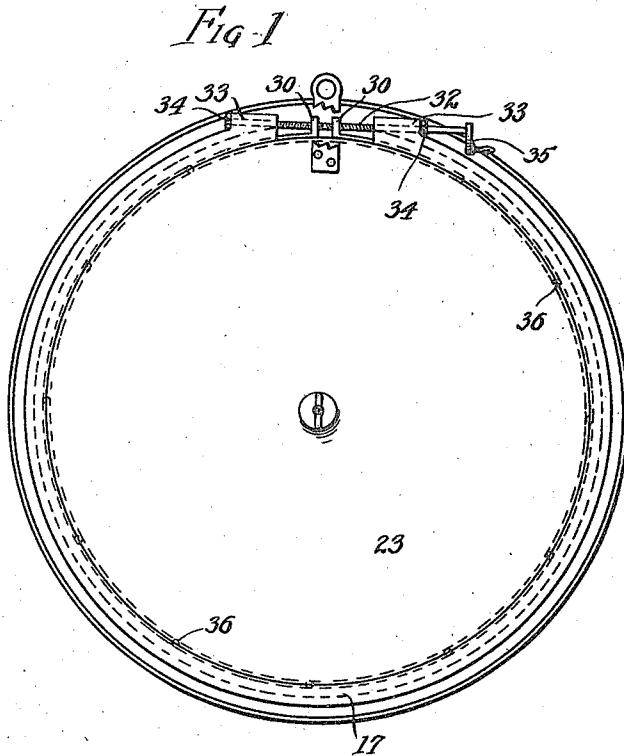
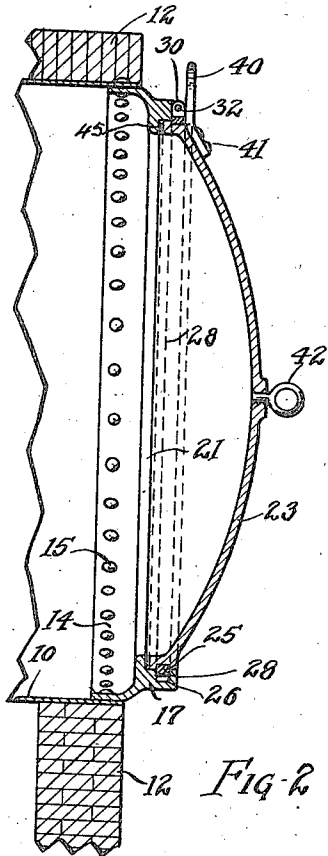


C. RIDDLE.
 DEVICE FOR LOCKING CLOSURES.
 APPLICATION FILED DEC. 15, 1913.

1,137,085.

Patented Apr. 27, 1915.



Witnesses
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UNITED STATES PATENT OFFICE.

CARLTON RIDDLE, OF AKRON, OHIO.

DEVICE FOR LOCKING CLOSURES.

1,137,085.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARLTON RIDDLE, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Devices for Locking Closures, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 This invention is for a locking device for metallic closures such as are used for the openings in large boilers, stills, digesting tanks, etc., and is adapted to be used where such closures are intended to withstand internal pressure. Its object is to provide a device by which such doors or closures may be quickly locked or unlocked allowing the ready removal and replacing of the closure.

15 My invention, in a preferred form, is hereinafter described in connection with the drawings, and the essential characteristics set forth in the claims.

20 In the drawings, Figure 1 is a front elevation of a closure for the end of a boiler; Fig. 2 is a vertical section of the same; Fig. 3 is a sectional detail on an enlarged scale; Figs. 4 and 5 are details of the locking rings on an enlarged scale.

25 10 indicates one end of the boiler adapted to contain water and steam, supported and surrounded by suitable brick work, indicated at 12. The end of the boiler shown is adapted to be closed by my device which provides a steam-tight closure adapted to withstand pressure. A short cylindrical ring 14 is riveted to the end of the boiler, as at 15, and has a forwardly extending portion 16 turned inwardly and carrying a casing ring member 17. The inner periphery of this casing ring is cylindrically bored as at 18. This bore extends inwardly to a shoulder 20 at right angles thereto, formed on an inwardly extending flange 21, rigid with the casing ring.

30 Snugly fitted into the bore 18 is a cylindrical portion 22 of a closure or door 23. The door is preferably rounded outwardly as shown in Fig. 2, and the flange 22 is squared off at the inner end forming a shoulder abutting against the shoulder of the flange 21. On the outer periphery of the cylindrical portion 22 is formed a parallel sided groove 25 registering with a corresponding groove 26 in the casing ring.

The door 23 is securely locked in place by an expansible ring 28, snugly fitted in the grooves 25 and 26 and adapted to be drawn into the groove 25 until it abuts the bottom of this groove which is of such depth that one half the ring is thus in this groove while the other half is in engagement with the groove 26. This locking position of the ring 28 is indicated in Fig. 2, and in Fig. 3 by a dotted line at 29, representing the outer periphery of the ring 28. The ring 28 extends substantially entirely around the member 23, but it is split in one place and has at its free ends outwardly extending ears 30, rigid therewith and adapted to be drawn together by a screw 32, having right and left hand threads in engagement with corresponding threads in each ear. Rotating this screw 32 in one direction expands the ring by spreading the ears 30 apart, and in opposite direction contracts the ring by drawing these ears together. The screw 32 is journaled in projections 33 rigid with the casing and having their inner ends spaced apart to allow for the movement of the ears 30. Collars 34 may be secured to the bolt 32 at the outer side of each of the bearings 33 to prevent end movement of the bolt, and a crank 35 may be provided for conveniently rotating the bolt by hand. The groove 26 is slightly more than twice as deep as the ring 25, which is slightly deeper than the thickness of the ring 28. Accordingly when the screw 32 is rotated to expand the ring, it expands till its outer periphery abuts against the bottom of the groove where the ring stands entirely in the groove 26, thus leaving the door 23 entirely free to slide outwardly allowing its removal. In order that the ring 28 may expand and contract evenly throughout its length, I prefer to divide it into sections and pivotally join these sections together by pins 36, extending through ears 37 on one end of each section of the ring, fitted over a tongue 38 on the end of the adjacent section. When the construction of the ring is such that it is comparatively thin for its diameter, it will have enough elasticity to provide for the necessary expansion and contraction without dividing it into sections as just described. When the ring is contracted half so that its inner engagement with the groove 25 and the outer half extend into the surrounding

casing, it will be seen that the resistance against moving the door outwardly would be that of a straight shearing strength of the width of the ring, substantially throughout its entire length. Accordingly, the parts adjacent the ring are so proportioned that there will be sufficient metal to get the full equivalent of the shearing strength of this ring. That is, the shoulder 20 is spaced from the groove 25 a distance equal to the thickness of the ring; the groove 26 is spaced in from the outer edge of the casing ring 17 a distance equal to the thickness of the ring. This provides a locking device for such closures which shall have very high efficiency of resistance to withstand pressure.

To provide for the convenient handling of the door 23, I provide at the upper side a suitable ring 40 having a shank secured to the door at 41. This ring stands substantially over the center of gravity of the door and is adapted to be engaged by a hoist hook. A second ring 42 may be secured to the central portion of the door to provide a suitable grip for pulling the door outwardly from the casing ring.

Although I have shown as a convenient means for expanding and contracting this ring, a screw having right and left hand threads engaging outwardly extending ears on the free ends of the ring, I do not wish to be limited thereto, as any convenient means may be used.

Suitable packing may be provided to insure the door being perfectly steam tight. As indicated at 45 in Figs. 2 and 3 elastic packing may be carried by the flange 22 and press against the shoulder 20 of the flange 21, when the door is locked in position.

It will be seen that the door may be removed very quickly, it being only necessary with the form shown, to rotate the crank 35 to expand the ring so that it lies entirely within the outer member and then draw the door outwardly from the casing. It is equally easy to replace and lock, this being accomplished by placing the door in position and contracting the ring until it engages the groove 25, as described.

From the foregoing description it will be seen that I have provided a device whereby closures or doors for large openings in stills, digesting tanks and boilers, may be quickly removed and replaced, it being only necessary to provide an annular casing having a groove on its inner periphery, a door having a portion fitting the casing with a groove facing the groove in the casing and a ring carried by the casing adapted to be contracted into engagement with the groove in the door.

Having thus described my invention, what I claim is:

1. In a device of the character described,

the combination of an annular casing having a cylindrical inner periphery, a groove on the inner periphery having parallel sides and a cut away portion adjacent one part of the groove extending to the outer portion of the casing, a closure fitting into said casing having a cylindrical periphery and a groove registering with the groove in the casing, a parallel sided flexible ring adapted to fit into said grooves and having two free ends projecting outwardly through the cut away portion of the casing, and means engaging these ends for separating and drawing them together, whereby the ring may be expanded to lie wholly within the groove in the casing or may be contracted to engage both grooves.

2. In a device of the character described, the combination of an annular casing having a cylindrical inner periphery, a groove on the inner periphery having parallel sides and a cut away portion adjacent one part of the groove extending to the outer portion of the casing, a closure fitting into said casing having a cylindrical periphery and a groove registering with the groove in the casing, a parallel sided expansible and contractible ring adapted to fit into said grooves, comprising a plurality of sections pivoted together and having two free ends outwardly projecting through the cut away portion of the casing, and a screw engaging these ends for separating and drawing them together.

3. In a device of the character described, the combination of an annular casing, a closure fitting into said casing, annular grooves in the casing and closure facing each other, one of said grooves being deeper than the other, an expansible and contractible ring in said grooves adapted to lie wholly in the deeper groove or be moved partially into the shallower groove whereby it may engage both of the grooves, and means for expanding and contracting said ring.

4. In a device of the character described, the combination of an annular casing having an annular groove on its inner periphery, a closure fitting into said casing and having an annular groove on its outer periphery registering with the groove on the casing, when the closure is in position, one of said grooves being deeper than the other, an expansible and contractible ring adapted to lie wholly within the deeper groove or fill the shallower groove and project into the other whereby it may engage both the grooves, said ring having threaded ends, and means for engaging said ends to contract and expand the ring.

5. In a device of the character described, the combination of an annular casing, a closure fitting into such casing having an annular groove in its periphery, an annular groove in the casing facing the groove in the closure, and a ring of solid material having

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two free ends and being circumferentially
expansible and contractible and adapted to
lie within said groove, said grooves being
of such proportions that the ring may fill
5 one and project into the other or may be
moved entirely into such other to allow the
removal of the closure.

In testimony whereof, I hereunto affix my
signature in the presence of two witnesses.

CARLTON RIDDLE.

Witnesses:

ALBERT H. BATES,
BRENNAN B. WEST.