

Nov. 16, 1943.

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2,334,448

PRESSURE RECEPTACLE CLOSURE

Filed Dec. 9, 1940

2 Sheets-Sheet 1

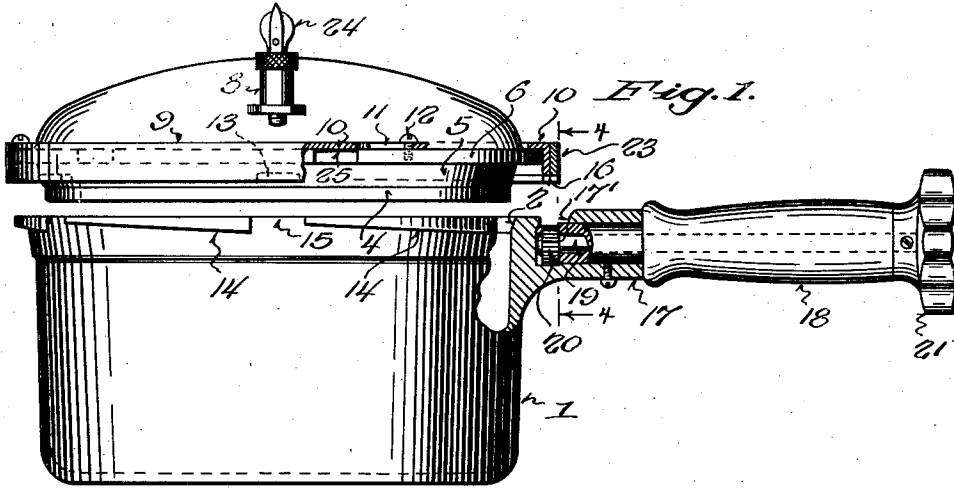


Fig. 2.

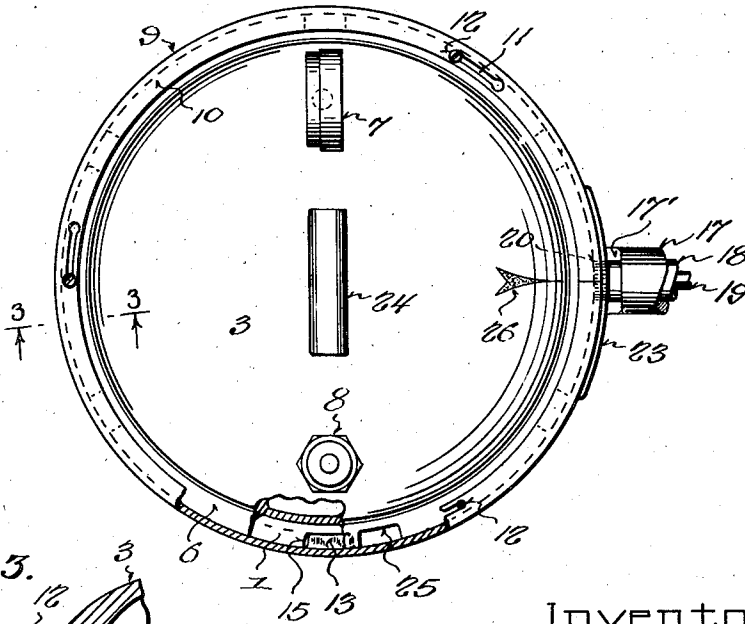
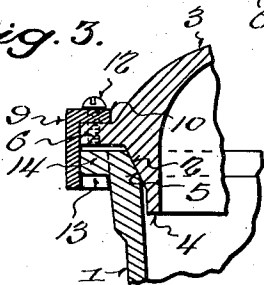


Fig. 3.



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Fig. 4.

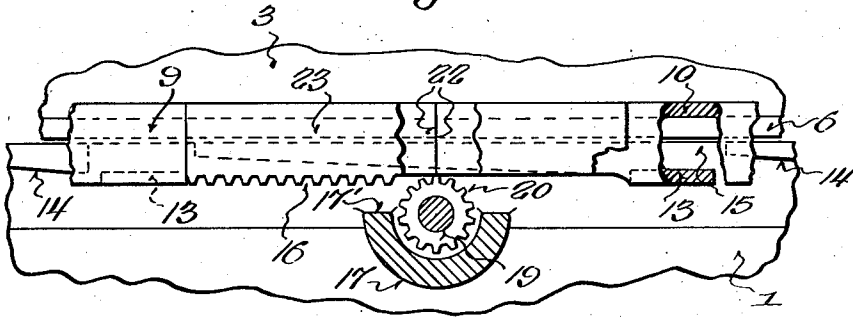


Fig. 5.

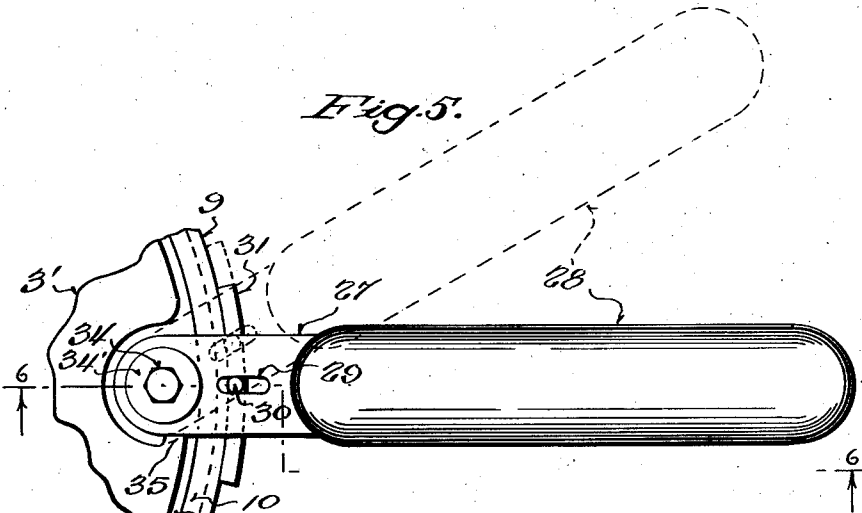
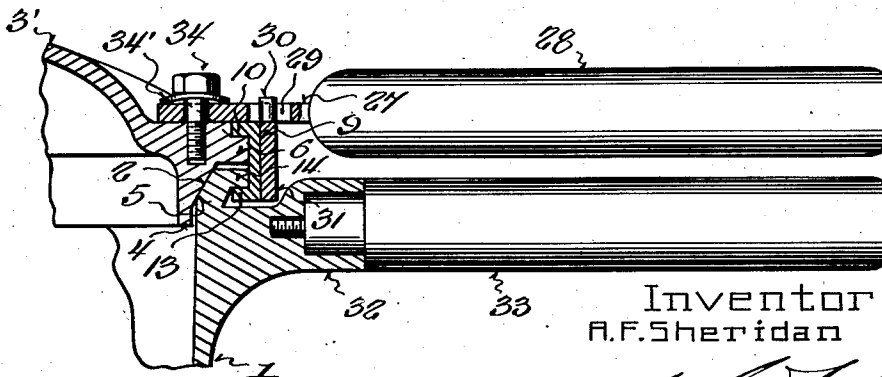


Fig. 6.



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UNITED STATES PATENT OFFICE

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PRESSURE RECEPTACLE CLOSURE

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2 Claims. (Cl. 220—61)

This invention relates to closures for pressure receptacles, which, for the purpose of explanation, will be illustrated and described in connection with a pressure sauce pan, utilized in steam cooking.

Heretofore, in clamping and sealing covers upon receptacles in which pressure is generated, it has been customary to employ a plurality of manually operable clamps, or expansible peripheral wedges, all of which are costly, and require awkward and tedious operations in both the locking and removal of the covers.

The present invention has primarily for its object to overcome the foregoing objections by the provision of an exceedingly simplified mechanism for effectively clamping and sealing a cover upon a receptacle through actuation of a single locking element, annularly shiftable with relation to both the cover and receptacle.

Incidental to the foregoing, a more specific object resides in the provision of a locking mechanism comprising a ring rotatable on the cover and receptacle, and functioning in connection with inclined surfaces disposed between the cover and receptacle to effect locking and sealing of the cover on its seat.

A still further object is to provide a locking mechanism of the foregoing type, which requires the seal between the cover and receptacle to be broken for venting pressure within the receptacle prior to removal of the cover.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the novel construction, combination, and arrangement of parts, substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawings is illustrated one complete example of the physical embodiment of the present invention constructed according to the best mode so far devised for the practical application of the principles thereof.

In the drawings:

Figure 1 is an elevational view of a pressure sauce pan with parts broken away and in section, and showing the cover in raised position;

Figure 2 is a plan view with parts broken away and in section;

Figure 3 is an enlarged fragmentary section taken on the line 3—3 of Figure 2;

Figure 4 is a similar view taken on the line 4—4 of Figure 1, with the cover seated on the receptacle;

Figure 5 is a fragmentary plan view of a modified form of the invention; and

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Referring now more particularly to the accompanying drawings, the numeral 1 designates a receptacle, which in the present instance comprises a sauce pan, or cooking utensil. The receptacle is provided with an open top having an internal tapered seat 2 for reception of a cover 3, provided with a depending flange 4, and an external taper 5 for sealing engagement with the seat 2.

The cover 3 is also provided with an annular peripheral flange 6 disposed above the taper 5, and equipped with the usual pressure gauge 7 and relief valve 8.

Mounted on the cover 3 is a lock ring 9, the upper, intumed flange 10 of which is supported on the top of the flange 6. To shiftablely retain the ring 9 on the cover flange 6, the flange 10 of the ring is provided with spaced, arcuate, key-hole slots 11 for reception of screws 12 threaded into the flange.

Extending inwardly from the lower edge of the lock ring 9 are a plurality of spaced fingers 13, while the top of the receptacle 1 is provided with a plurality of peripheral, spaced, external flanges 14, the lower surfaces of which form inclined planes. To seat the cover 3 on the receptacle, the fingers 13 of the angle ring 9 are alined with the spaces 15 between the flanges 14, and after the cover is positioned on its seat and slightly rotated in a counterclockwise direction, the fingers 13 engage the inclined surfaces of the flanges 14 to hold the cover upon the receptacle.

It is old in the art to lock and bind a cover upon a receptacle by means of inclined surfaces engaged by fingers, but in such structures actual binding and sealing of the cover on its seat depends solely upon manual rotation of the cover by means of its handle, and in practice it is found that the leverage is such as to prevent obtaining a tight seal.

Therefore, a salient feature of the invention resides in the locking mechanism including the ring 9, which permits the engaging fingers 13 to be shifted independently of the cover by means of various types of levers.

In the preferred form of the invention, a portion of the ring 9 is provided with rack teeth 16 formed on its lower edge, while the receptacle is provided with a boss 17 for reception of a handle 18, in which a shaft 19 is journaled. Secured upon the inner end of the shaft 19 in vertical alinement with the rack teeth 16 is a pinion 20, while the outer end of the shaft is provided with a hand wheel 21 for rotation of the pinion 20.

As best shown in Figures 1 and 2, the inner end of the boss 17 is notched out at 17' to expose the top of the pinion 20. Consequently, when the cover is seated on the receptacle, the rack teeth 16 are alined for engagement with

the pinion 20 upon rotating the ring with relation to both the cover and receptacle.

While the ring 9 may be formed in any desired manner, in the present instance the same is constructed from a strip of channel iron formed into a ring with its abutted edges 22 welded together. At this point, a plate 23 is welded to the outer face of the ring, which serves not only to reinforce the welded ends of the ring, but also increases the width of that portion of the ring in which the rack teeth 16 are formed.

The lower flange of the ring is blanked out to provide the engaging fingers 13. It will, therefore, be apparent that an exceedingly simple, sturdy, and inexpensive locking ring has been provided, which can be formed at low cost from stock material.

To permit detachment of the ring 9 from the cover 3, for either replacement or cleaning, the flange 6 is provided with spaced notches 25 for alignment with the fingers 13, when the ring is shifted on the flange 6 to align the enlarged openings in the keyhole slots 11 with the heads of the screws 12, thus allowing the ring to be lifted from the flange.

In operation, the cover 3, which is manipulated by a handle 24, is placed in the position shown in Figure 1, in which the fingers are aligned with the spaces 15 between the flanges 14, and the rack teeth positioned to one side of the pinion 20, as best shown in Figure 4. The cover is then slightly rotated to shift the fingers 13 under the flanges 14, during which operation the pinion 20 is engaged by the teeth 16 of the locking ring. When the cover has been rotated sufficiently to bring the fingers 13 into engagement with the inclined faces of the flanges 14, at which point the teeth 16 are engaged by the pinion, final pressure is placed upon the cover by rotating the hand wheel 21, causing the locking ring 9 to be further shifted to force the locking fingers 13 against the inclined faces of the flanges 14. The cover is then urged down upon the seat 2 to effectively seal the receptacle against pressure generated therein, and determined by the setting of the relief valve 8.

The position of the cover for proper seating on the receptacle is facilitated by an indication 26 provided on the cover for alignment with the boss 17.

In the modified form of the invention illustrated in Figures 5 and 6, instead of utilizing a rack and pinion for annularly shifting the locking ring 9, a lever 27 provided with a hand grip 28 is pivotally connected to the cover 3' adjacent its edge by a threaded stud 34 and friction washer 34'. The lever 27 has a longitudinal slot 29 formed therein for reception of a pin 30, carried by a plate 31 welded to the outer face of the ring 9. To limit movement of the lever 27 in one direction, for the purpose hereinafter explained, the cover 3' is provided with an abutment 35, which forms a stop. The receptacle 1 is provided with a conventional boss 32 for reception of a handle 33.

Aside from the means for actuating the ring 9 in the modified form of the invention, the operation is the same as heretofore explained in connection with the preferred form of the invention, the locking and sealing operation being effected by swinging the lever 27 to the position indicated in dotted lines in Figure 5, which, through its connection with the plate 31, serves to shift the ring 9 for engagement of the fingers

13 with the inclined faces of the flanges 14 of the receptacle.

From the foregoing explanation considered in connection with the accompanying drawings, it will be readily seen that a simple form of closure lock has been provided for quickly clamping and sealing the cover on the receptacle through a single operation, the actuating means being such as to provide sufficient leverage for effecting a tight seal with minimum effort upon the part of the operator. As set forth in the preceding objects, during the initial releasing movement of the locking ring 9, pressure contained within the receptacle tends to raise the cover and break the seal, thus venting the pressure. At the same time, the cover is prevented from being blown from the tank and injuring the operator, inasmuch as the fingers 13 are still positioned under the flanges 14. After the seal has been broken, further rotation of the ring and cover is required, in order to remove the latter after venting has occurred.

While in those forms of the invention illustrated, the locking ring is carried by the cover, and the inclined flanges by the receptacle, it is to be understood that these elements may be reversed without departing from the principle of the invention, and in some instances the inclined surfaces may be incorporated in the ring rather than on either the cover or receptacle, inasmuch as the salient feature of the invention resides in a rotatable locking ring actuated through any desired type of lever in combination with inclined planes to effect forcing of the cover upon its seat to seal the receptacle.

It is also highly important to the principle of the invention that the annular locking ring be shiftable a limited amount with relation to both the cover and receptacle. This is accomplished in the preferred form of the invention by the length of the rack 16, and in the modification by the abutment 35.

Attention is also directed to the fact that in both forms of the invention, shifting of the ring on the releasing operation is insufficient to clear the fingers 13 from the flanges 14 without further rotating the cover, thus insuring complete venting before the cover can be removed.

I claim:

1. In a pressure cooking receptacle having an annular open top and a separable cover seated thereon, an annularly shiftable locking ring carried by and removable with said cover for engaging the periphery of said receptacle to seal the cover upon its seat, a manually actuated pinion carried by the receptacle and having its longitudinal axis disposed at a right angle to the axis of said ring, and a toothed rack carried by said ring for engagement with said pinion when the cover is positioned on the receptacle.

2. In a pressure cooking receptacle having an annular open top and separable cover seated thereon, an annularly shiftable locking ring carried by and removable with said cover for engaging the periphery of said receptacle to seal the cover upon its seat, interengaging means between said cover and ring to permit quick detachment of the ring by shifting the same on the cover, a manually actuated pinion carried by the receptacle and having its longitudinal axis disposed at a right angle to the axis of said ring, and a toothed rack carried by said ring for engagement with said pinion when the cover is positioned upon a receptacle.

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