N. TROYER.

MEANS FOR SECURING RETORT DOORS.

APPLICATION FILED DEC. 19, 1917.

1,321,341.

Patented Nov. 11, 1919.

3 SHEETS—SHEET 1.

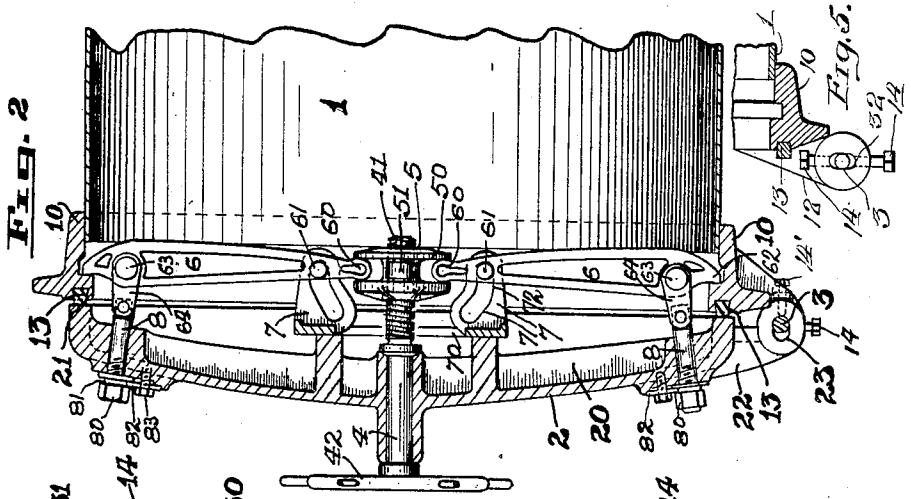


Fig. 2

Fig. 5.

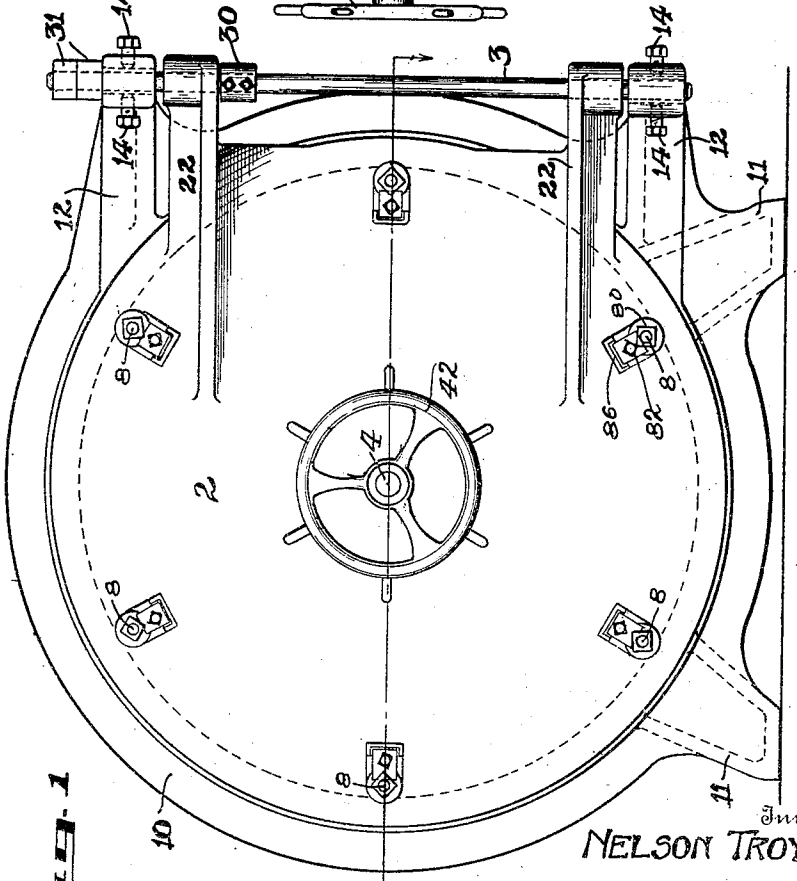


Fig. 1

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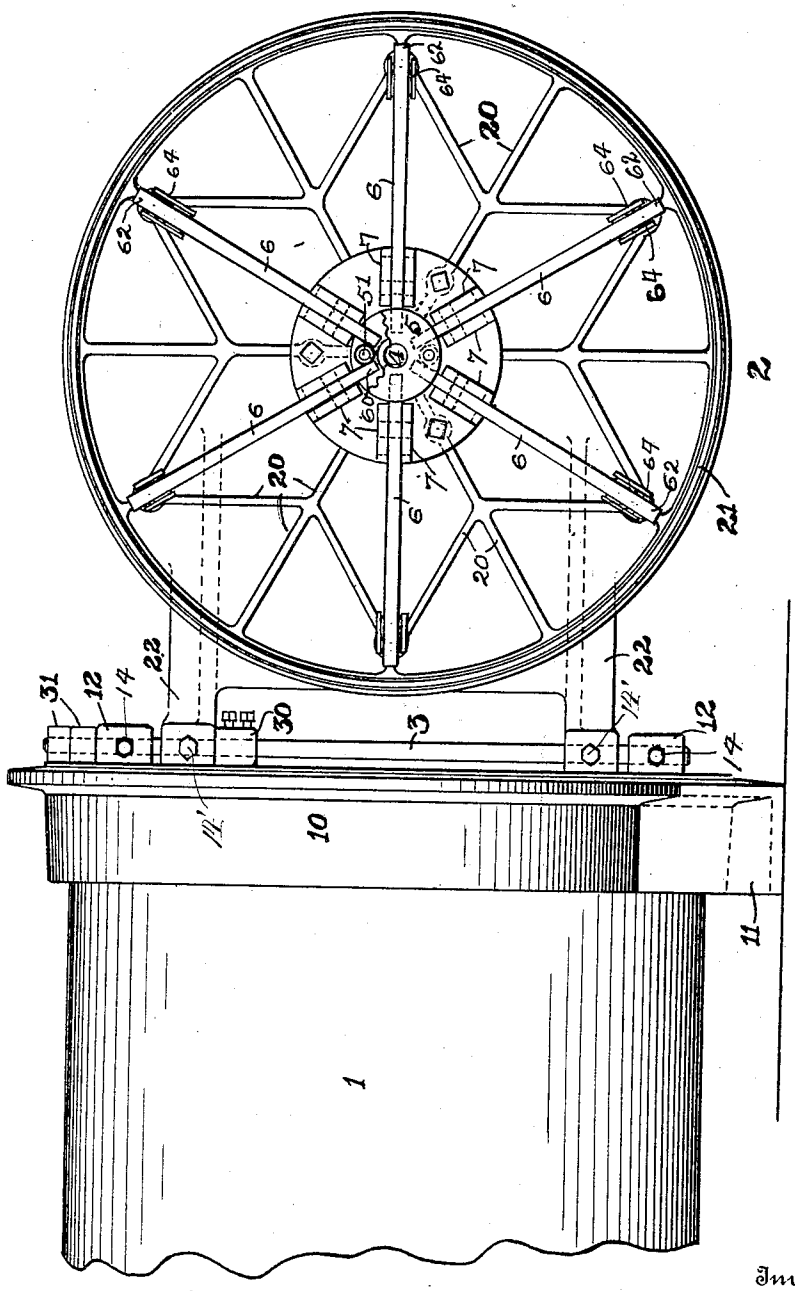
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3 SHEETS—SHEET 2.

Fig. 3



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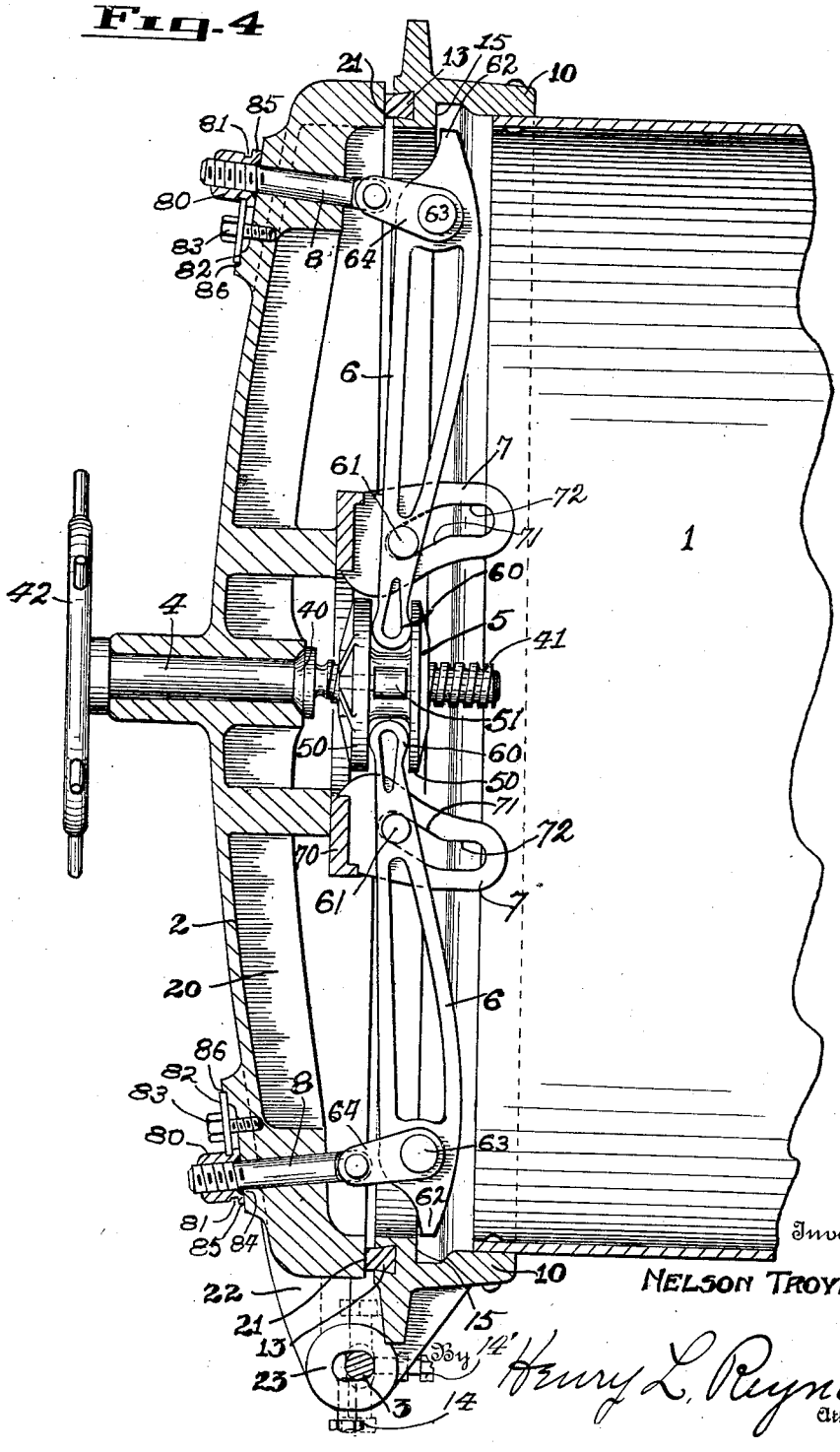
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3 SHEETS—SHEET 3.

Fig-4



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UNITED STATES PATENT OFFICE.

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MEANS FOR SECURING RETORT-DOORS.

1,321,341. Specification of Letters Patent. **Patented Nov. 11, 1919.**

Application filed December 19, 1917. Serial No. 207,943.

To all whom it may concern:

Be it known that I, NELSON TROYER, a citizen of the United States, and resident of the city of Seattle, county of King, and State of Washington, have invented certain new and useful Improvements in Means for Securing Retort-Doors, of which the following is a specification.

My invention relates to retorts of the kind which are used for cooking and sterilizing food products after they are placed in cans and consists of an improved construction of door and the means for mounting and closing the same in order to obtain a tight closure which will prevent escape of steam under the pressures employed.

The object of my invention is to produce a door and the means for sealing the same so that the door may be quickly and easily sealed tightly and opened and closed.

It is also one object to secure this result by a simple type of structure which is relatively inexpensive to make while at the same time securing superior results in efficiency of closing, ease of handling and safety.

The special features of my invention which I believe to be novel and which I desire to patent will be hereinafter described and then particularly defined by the claims.

In the accompanying drawings I have shown my invention in the type of construction which is now most preferred by me.

Figure 1 is an outer end view of the retort with the door in closed position.

Fig. 2 is a section taken on a horizontal plane showing the door and its holding mechanism in door-closed position.

Fig. 3 shows a side view of the end of the retort with the door open showing the appearance of the inner side of the door.

Fig. 4 is a horizontal section through the door and the end of the retort shell showing the door holding and locking mechanism in position to release the door.

Fig. 5 is a section through the door casing just above one of its hinge arms.

The shell 1 of the retort is usually built of plates after ordinary tank or boiler construction. The rear end is commonly permanently closed, and a trackway is provided within the retort for receiving the cars which carry the cans which are to be processed. As all this is common construction I have not attempted to illustrate it in detail.

To the open end of the tank is secured an iron frame 10 which serves as a door casing and which is also provided with feet 11, and with arms 12 which form the fixed portions of the door hinges. The outer end face of this ring is provided with a groove in which is placed a compressible packing 13.

The door 2 may be of any suitable construction. I have illustrated this as of cast construction, and provide it with stiffening ribs 20. It should have a seating face 21, of suitable diameter to cover the packing ring 13, with which it engages when the door is closed.

The door has hinge arms 22 which contain pintle receiving holes 23 which are slightly elongated in a direction perpendicular to the plane of the door. The complemental hinge arms 12 of the door casing have pintle receiving holes which are also elongated, but in a direction parallel with the plane of the door casing.

A pintle shaft 3 passes through both sets of hinge arms. By reason of the elongation of the holes 32 in the arms 12, this shaft may be adjusted slightly toward and from the center. A convenient and efficient means for securing such adjustment is by means of the set bolts 14 which are placed at opposite ends of the pintle receiving slots.

In the arms 22 of the door, a single adjusting bolt is used, this being at the inner side of the door. The door is thus permitted to have a limited inward movement to properly seat itself upon the packing and to engage the face 21 therein as strongly as may be necessary to secure a tight joint. By adjusting the pintle relative to the fixed hinge arms 12, the proper registering of the door flange 21 with the packing ring 13 may be secured.

I also provide means whereby the weight of the door may be carried by the pintle and also whereby the door may be vertically slightly adjusted. I do this by securing a collar 30 to the pintle in position to supportingly engage the lower side of one of the hinge arms 22 of the door. The upper end of the pintle rod 3 has jam nuts 31 by which its vertical position may be adjusted.

A shaft 4 is rotatively mounted centrally

of the door. Within the door it has a collar 40 having engagement with the door such as to form a tight joint which will prevent the escape of steam. I have shown these engaging surfaces as conical.

The inner end 41, of this shaft is threaded and has a nut 5 thereon. The threads of this shaft and nut are preferably left-handed, so that upon right-handed turning the wheel 42, which is secured to the outward extension of the shaft, the nut 5 will be moved inwardly or away from the door.

A series of clamping levers 6 are radially positioned and hinged for movement in planes which are axial to the door. They are also mounted so as to have a limited bodily movement radially of the door. The inner ends 60 fit snugly between flanges 50 of the nut 5 so as to be moved by the travel of the nut upon the shaft 4.

Toward their outer ends the levers 6 are fulcrumed in such manner that they may have bodily movement lengthwise, that is, radially of the floor. The preferred manner of doing this is to secure the pivot axis 63 in links 64 which are pivotally supported from the door. To secure separate and independent adjustability of this fulcrum for each lever axially of the door, I prefer to mount the links 64 for each lever upon a bolt, as 8, which extends through the door and has a securing and adjusting nut 80 upon its outer end. By such a construction additional pressure may be applied locally at any point about the margin of the door, to thus stop any leak without increasing the pressure where it is not needed. This may also be done from without the door and while it is closed.

To secure a tight, steam tight joint about this bolt, I may slightly ream out the bore of the nut at its inner face to form a slight ring-like cavity at 84, in which to place a strand of suitable packing material. The nut 80 is provided with a slight flange 85, at its base and a shallow groove 81 just outside this flange, in which grooves is placed one edge of a plate or washer 82 which is secured in place by a bolt 83 and by a ledge 86. By this means the nut is held against the outer face of the door so that it may be freely turned and yet so that neither it or the bolt may be forced outwardly.

The ring 10 has a recess or recesses formed upon its inner face a short distance inward from its outer end face to thereby provide surfaces 15 for engagement by the short outer ends 62 of the clamping levers 6. This has been shown as a groove which extends entirely about the inner face of the ring, as thereby the surface 15 may conveniently be made smooth and true for all the levers.

Secured to the inner side of the door are a series of cam plates or ears 7, herein shown as formed integrally with a ring or plate 70 which is secured to the door, preferably two for each lever 6, between which the inner ends of the levers lie. These ears have slots consisting of an outer inclined section 71 and an inner straight section 72, within which extend bosses 61 of the levers. When the nut 5 is drawn toward the door it carries the inner ends of the levers 6 with it and the bosses 61 engaging the inclined sections 71 of the slots draw the levers 6 bodily toward the center enough to clear their outer ends 62 from the ledge 15. The door is then free to open or close. When the nut is moved in the opposite direction, or inward, the levers are forced radially outward until they engage the ledge 15, as is shown in Fig. 2, and further movement of the nut inward, during which the bosses 61 are in the straight section 72 of the slots, tightly draws the door down upon the packing ring 13.

The nut 5 must be kept from rotation. This is preferably done by engagement with the side faces of the inner ends 60 of the levers 6. For convenience of securing accurately spaced and true faces of the flanges 50, I prefer to turn them, and to prevent turning of the nut I then insert one or more stops between these faces in the spaces between the ends of two adjacent levers. Such a stop may be as a roller 51, which is of such diameter as to snugly fill the spaces between two levers.

In case the door does not seat tightly in any particular sector, one or more of the fulcrum bolts 8 in this sector may be tightened, until the door is well seated. This may be done from without while the door is closed and while the steam pressure is on.

In opening the door the joint between the door and the casing will be loosened enough to permit escape of steam, if there be a pressure of steam in the retort, before the clamping levers 6 release their grip upon the casing, thus warning the operator of the existence of the steam pressure in time to prevent any danger.

What I claim as my invention is:

1. A clamping device for retort doors comprising a series of radially placed levers having fulcrums toward their outer ends which fulcrums are fixed relative to the levers and movable radially of the door, and clamping means engaging the inner ends of said levers and adapted to both move the levers lengthwise and to swing them upon their fulcrums by the clamping action.

2. A clamping device for retort doors comprising a series of locking levers extending radially of and at the inner side of the door, fulcrum links pivoted to the door and to the levers to swing radially of the door and means operable from without the door to both radially shift said fulcrums and to

swing the levers upon their fulcrums to thereby engage the levers with the door jamb and to then seat the door.

3. A clamping device for retort doors comprising a series of locking levers extending radially of and at the inner side of the door, fulcrum links pivotally connecting the levers with the doors to swing radially of the doors, cams engaging the inner parts of said levers to produce a radial movement of the levers by the swinging thereof, and means operable from without the door to swing said levers.

4. A clamping device for retort doors comprising a series of radially placed clamping levers upon its inner side, fulcrum links pivoted to the door and to the levers near their outer ends to permit movement of the levers radially of the door, a door casing having abutment surfaces alined with said levers, and means moving the inner ends of said levers perpendicular to the plane of the door and means whereby said movement of the levers will also produce a radial movement of said levers confined to that part of their swinging movement which is adjacent to their fully open position.

5. In a clamping device for retort doors, a door, a door casing having clamping lever engaging abutments, a series of fulcrum bolts passing through the door toward its outer edge, a series of clamping levers, links pivotally connecting said levers with their fulcrum bolts to permit swinging of the levers in a radial direction, means for swinging the levers upon their fulcrums, and cam means for projecting the outer ends of the levers to engage the casing abutments during the earlier part of the clamping swing of the levers.

6. In combination in a retort, a door casing, a door, a series of clamping levers pivotally supported at the inner side of the door to move radially of the door, abutments carried by the casing to be engaged by the outer ends of said levers, cams fixed upon the door and engaging the inner parts of said levers to produce lengthwise movement of the levers to engage and disengage them from said abutments during that part of the swinging movement which is adjacent the door, a nut having engaging connection with the inner ends of said levers, means for holding said nut against turning, and a shaft threading into said nut and passing through the door.

7. A clamping means for retort doors comprising a fulcrum bolt passing through the door near its edge, and adjustable from without the door, clamping levers fulcrumed upon said bolts within the door and adapted to engage with the door casing, and means for operating said levers.

8. In a clamping device for retort doors, in combination, a door, a fulcrum bolt extending through the door, a clamping lever within the door and fulcrumed upon said bolt, an adjusting nut upon said bolt outside of the door, and a retaining member engaging said nut to hold it against the door.

9. In a clamping device for retort doors, in combination, a door, a fulcrum bolt extending through the door, a clamping lever within the door and fulcrumed upon said bolt, an adjusting nut upon said bolt outside of the door, said nut having a projecting flange, a retaining plate overlapping said flange and a bolt for securing said plate.

10. In a clamping device for retort doors, in combination, a door clamping mechanism mounted upon the inside of the door, an operating shaft extending through and rotatively mounted in the door and having an inwardly projecting threaded end, and a nut fitting upon said threaded end and operatively connected with the door clamping mechanism to prevent its rotation, and means for turning said shaft from without the door.

11. In a clamping device for retort doors, in combination, a door casing, a door, door clamping levers pivoted upon the inner side of the door and adapted to have locking engagement with the door casing, a common operating means for all of said levers operable from without the door, and means operable from without the door for separately adjusting the clamping action of each of said levers.

12. In a clamping device for retort doors, in combination, a door casing, a door, clamping levers mounted upon the inner side of the door and movable to engage the door casing, links engaging said levers near their outer end to provide swinging fulcrums therefor, bolts supporting said links and extending through the door and having adjusting nuts upon their outer projecting ends, and a common swinging means for all said levers.

13. In a clamping device for retort doors, in combination, a door casing, a door, clamping levers mounted upon the inner side of the door and movable to engage the door casing, links engaging said levers near their outer end to provide swinging fulcrums therefor, bolts supporting said links and extending through the door and having adjusting nuts upon their outer projecting ends, a shaft journaled centrally of the door and having a threaded inwardly projecting end, a nut on said shaft having flanges embracing the inner ends of all said levers, and means for preventing turning of said nut.

14. In a clamping device for doors, in combination, clamping levers mounted upon the inner side of the door and adapted to engage the door casing, pivot supporting

bolts extending through the door, fulcrum links connecting said bolts with the levers, nuts engaging the outer ends of said bolts, retaining means engaging said nuts to hold them in fixed position while permitting their being turned, a shaft rotatively mounted centrally of the door, and means operated through said shaft to simultaneously swing all of the clamping levers.

Signed at Seattle, Washington, this 11th day of December, 1917.

NELSON TROYER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."