J. F. WELLS.

RETORT.

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1,209,365.

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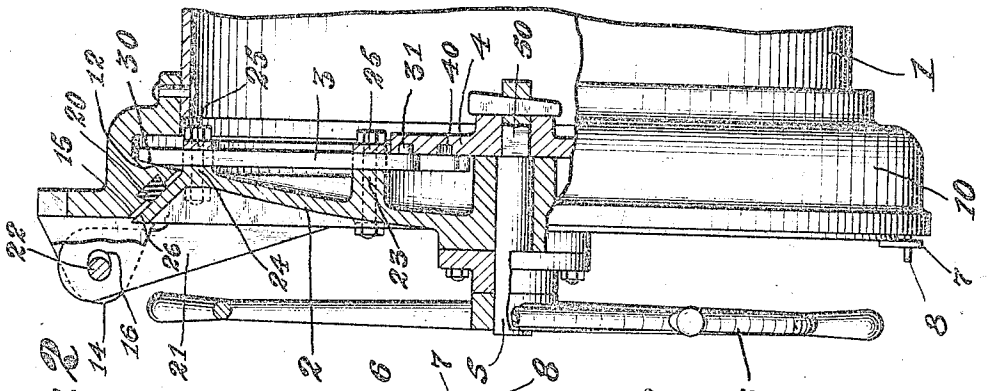


Fig. 2.

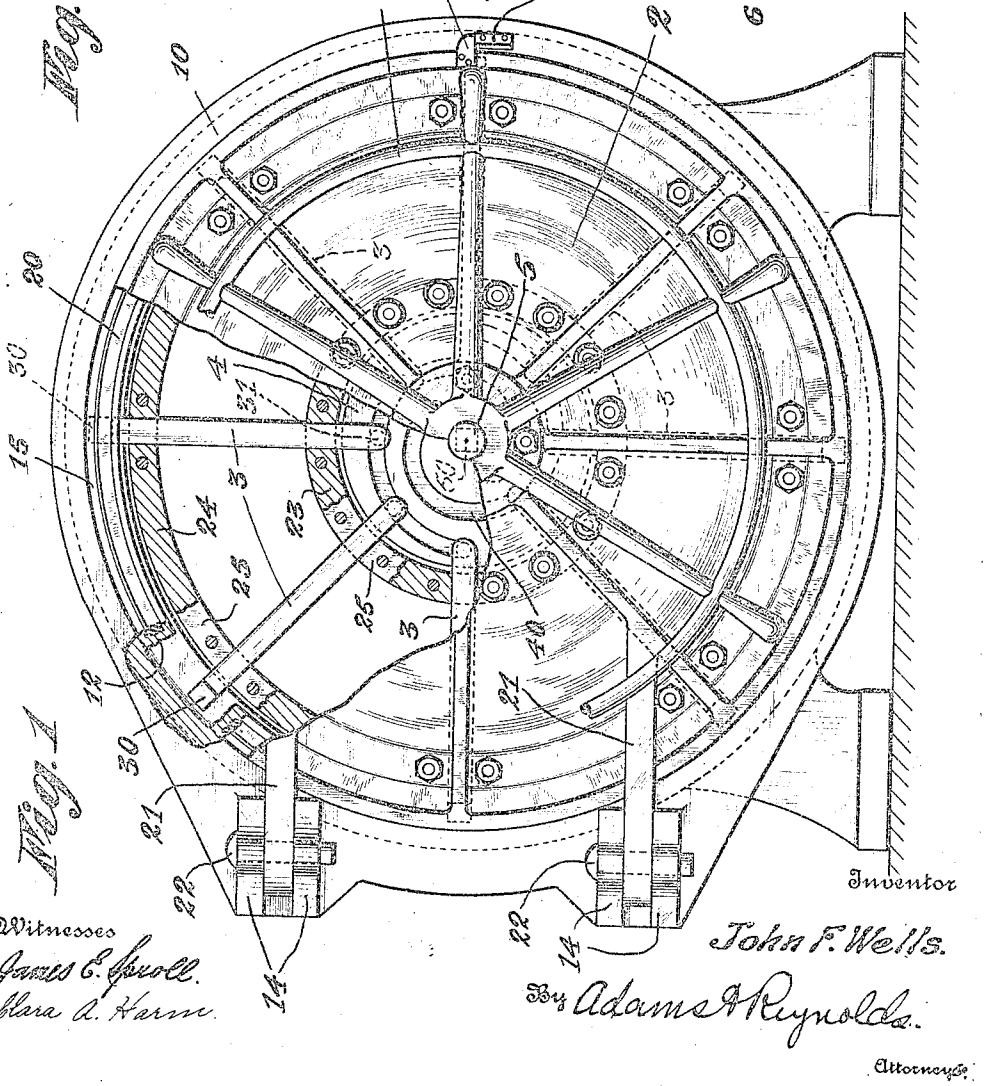


Fig. 1.

Witnesses

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UNITED STATES PATENT OFFICE.

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RETORT.

1,209,365. Specification of Letters Patent. Patented Dec. 19, 1916.

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To all whom it may concern:

Be it known that I, JOHN F. WELLS, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Retorts, of which the following is a specification.

My invention relates to retorts of the kind which are used for "processing" or sterilizing canned goods and the like products, such for instance, as fish, fruits, vegetables, meats, etc.

The object of my invention is to provide a retort that shall be adapted to receive and contain fluid under pressure, as steam, and which shall embody a hinged door and devices operatively associated with said door and its casing whereby said door may be closed and secured in its closed position in such manner that it may not be opened while there is a considerable degree of pressure within said retort, and whereby when said door is in its closed position then the fluid under pressure within said retort may escape between the adjacent surfaces of said door and its casing only when the pressure of said fluid rises above that degree that is required under normal conditions of operation.

My invention comprises novel parts which will be hereinafter described and particularly pointed out in the claims.

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

Figure 1 is a front elevation of the door end of the retort, the door being in closed position and parts thereof broken away to better show the interior construction. Fig. 2 is a side elevation of the door end of the retort, part of the same being broken away on the center line to show the relationship of the parts.

The retort, only a fragment of which is shown, is of circular cross section, as this type of retort is best adapted to resist the internal pressure which is required in much of the processing work. The type and construction of the retort body has no essential relationship to my special features. Its length may also be anything desired. It may, also have a door such as I have herein shown at one end only, or may be provided with such a door at each end, as desired.

At the end or ends of the retort, where a door is to be provided, a circular door casing 10 is secured to the retort body 1, this being a casting to which the shell, which is of plate material, is riveted. This casing ring is preferably exterior of the shell 1.

The circular door casing 10 has an outwardly-facing beveled surface 15, which forms the door seat. This surface is concentrically grooved to receive a packing ring 20, of yielding material as asbestos felt which will somewhat compress or be disrupted under pressure and which will also stand the temperatures employed in processing. This packing ring projects from the face of the seat, one purpose of this being to provide material for the compression needed, and another being to provide a safety, releasing or yielding member, which will yield or disrupt should the pressure rise to a point where there is possibility of danger from explosion.

The door 2, is provided with hinge lugs 21, which coöperate with complemental arms or lugs 14 that are integral with the door casing 10. Pins 22 passing through these arms constitute pintles for the door hinges. The pivot holes 16 in the lugs 21 of the door 2 are oblong in cross-section in order to permit said door 2 to be moved bodily to force its engaging surfaces against the packing ring 20 to compress said packing ring 20 independently of any swinging movement of said door.

Mounted in suitable guides on the inner face of the door, as the ring flanges 23 and 24, are a series of radially extending locking bolts 3, these being movable radially to permit their outer ends being projected beyond or drawn within the outer margin of the outer guides 24. The inner ends these locking bolts are provided with means for engagement with operating cams, such means as shown consisting of laterally projecting pins or rollers, 31, which enter spiral grooves 40, formed in the face of a disk 4, which is mounted to be turned about the central axis of the door. The disk 4 is shown as having a central square hole fitting over a like square end 50 of a shaft 5, which is journaled in and passes through the door. Outside the door suitable means are provided by which to turn this shaft, the means shown being a large wheel 6, having handles and spokes by which it may be turned.

The outer ends of the locking bolts 3, have their side faces which are outward, slightly

beveled, the angle of this bevel corresponding with the angle given the inwardly facing engaging surfaces 12, of the casing. These surfaces 12, may be the outer sides of a series of pockets formed in the casing, or the corresponding wall of a groove or ring which extends entirely about the casing. The latter construction is for some reasons preferable, as for economy of finishing.

In operation, after the door has been swung into place, the wheel 6 is turned in the direction which causes the locking bars 3 to be projected, their inclined surfaces 30 engaging the inclined surfaces 12 of the casing, these by their wedge action, force the door against its seat. As the seating of the door is upon the compressible packing ring 20, this will be compressed enough to form a steam tight joint.

The amount of projection of the packing ring 20, is such that the beveled metal surfaces 15 of the door casing 10 and 26 of the door, will never be brought into contact. This leaves a groove between these two surfaces which is at all times accessible to the steam pressure existing within the retort. The packing ring 20, besides serving as a means for making a tight joint, also serves as a safety member to prevent the accumulation of a dangerous pressure within the retort. The resisting capacity of this packing ring 20 and the separation of the surfaces 15 and 26, should be so gaged that its material will be further compressed to open a passageway between said surfaces 15 and 16, or so that it will give away and pieces thereof be blown out or it will be ruptured enough to permit escape of steam, before the pressure in the retort reaches a dangerous point. This escape of steam cannot be sufficient in quantity to be dangerous, but will immediately attract attention to the condition existing, so that the steam supply may be cut off. In any event, the area of the packing ruptured, will be sufficient to form an ample relief discharge which will prevent the accumulation of a dangerous pressure. Explosions of retorts of other constructions are sufficiently frequent to make this safety feature of considerable importance.

I have found by experience that the construction of the retort door and the means employed for securing it, has another safety feature of considerable importance.

It has happened many times, with other types of door securing structures, that the door has been loosened or unlocked before the steam pressure in the retort has been sufficiently lowered. The result is a violent outward swing of the door which is dangerous to the operative handling the retort and often to others, the contained steam is blown out in a cloud which is liable to scald many, and the hinge of the door is likely to be broken.

By reason of the friction between the holding surfaces of the door casing 10 and the bolts 3, due to the heavy aggregate pressure exerted against the door to hold these surfaces in contact, the resisting against a withdrawal of these bolts while the pressure is on, is very great and it is practically impossible for a man to release the door until the pressure in the retort has been reduced to a point where there is no danger.

To insure exact positioning of the door, I provide a projecting finger 7 at the side opposite the hinge, and a coöperating holding finger 8 projecting from the casing and having an inclined upper surface which will raise this side of the door into position to bring the door exactly central with the opening in the casing.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States of America, is:

1. A retort of the class described, embodying a door-casing; a door hinged to said door-casing and adapted to be opened outwardly from its closed position; and a yielding ridge of steam packing associated with said door-casing and disposed operatively to engage with, and be compressed by, said door when said door is in its closed position, said packing being composed of material that adapts it to be disrupted and to yield to an abnormal pressure of steam, whereby steam may find passageway between said door and said door-casing to reduce its pressure within said retort only when said pressure is greater than is desired under normal conditions of use.

2. A retort of the class described, which embodies a circular door-casing having an annular flange disposed to project from its internal surface; a circular door hinged to said door-casing and adapted to be opened outwardly from its closed position wherein it is slightly spaced from the front side of said flange; elastic packing material disposed to form a yielding annular ridge on the front side of said flange, which ridge is adapted yieldingly to engage with said door when said door is in its closed position, said packing material being of a character that will adapt said ridge to yield or be disrupted in response to an abnormal pressure within the retort; and a plurality of lock bolts associated with said door and disposed to adapt them to be radially moved to project their outer portions into engagement with the rear side of said flange to lock said door in its closed position, the engaging surfaces of said end portions being beveled, thereby to cause said door to be forced against said yielding ridge in response to the operation of locking said door.

3. A retort of the class described, which embodies a circular door-casing having an

inwardly projecting annular flange whose front side is provided with an annular dovetailed groove; a circular door hinged to said door-casing and adapted to be opened outwardly from its closed position wherein it is slightly spaced from the front side of said flange; elastic packing material packed in said dovetailed groove to fill it and to project outwardly therefrom to form an annular yielding ridge with which said door shall engage when said door is in its closed position, said packing material being of a character that will adapt said ridge to yield or be disrupted in response to an abnormal pressure within the retort; and means for releasably clamping said door in its closed position.

Signed at Seattle, Washington, this 18 day of May, 1915.

JOHN FREDERICK WELLS.