March 30, 1926. 1,579,116

A. KEMPKEY

DOOR OPERATING MECHANISM FOR RETORTS

Original Filed Nov. 5, 1920 3 Sheets-Sheet 1

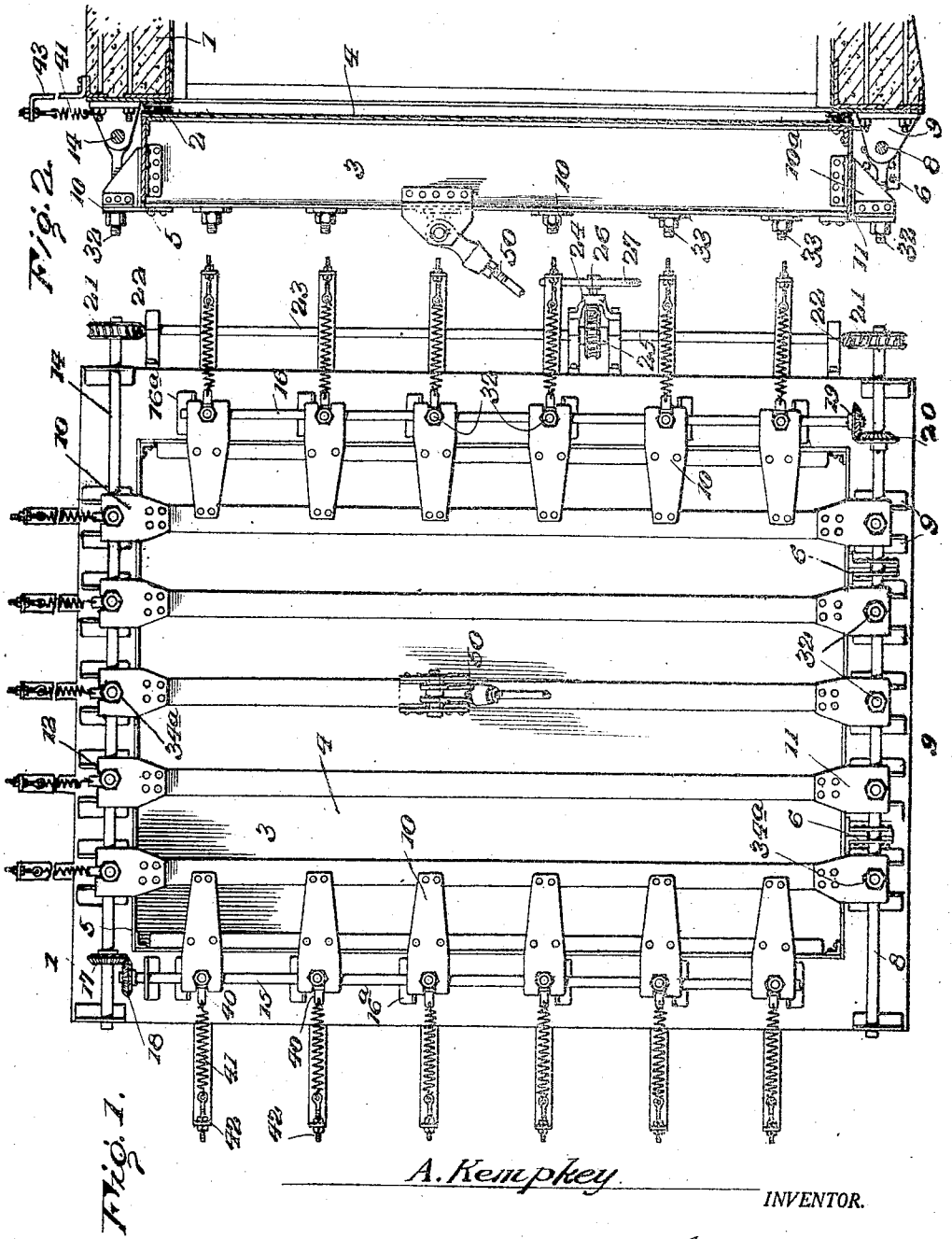


Fig. 2.

Fig. 1.

A. Kempkey
INVENTOR.

BY

ATTORNEY.

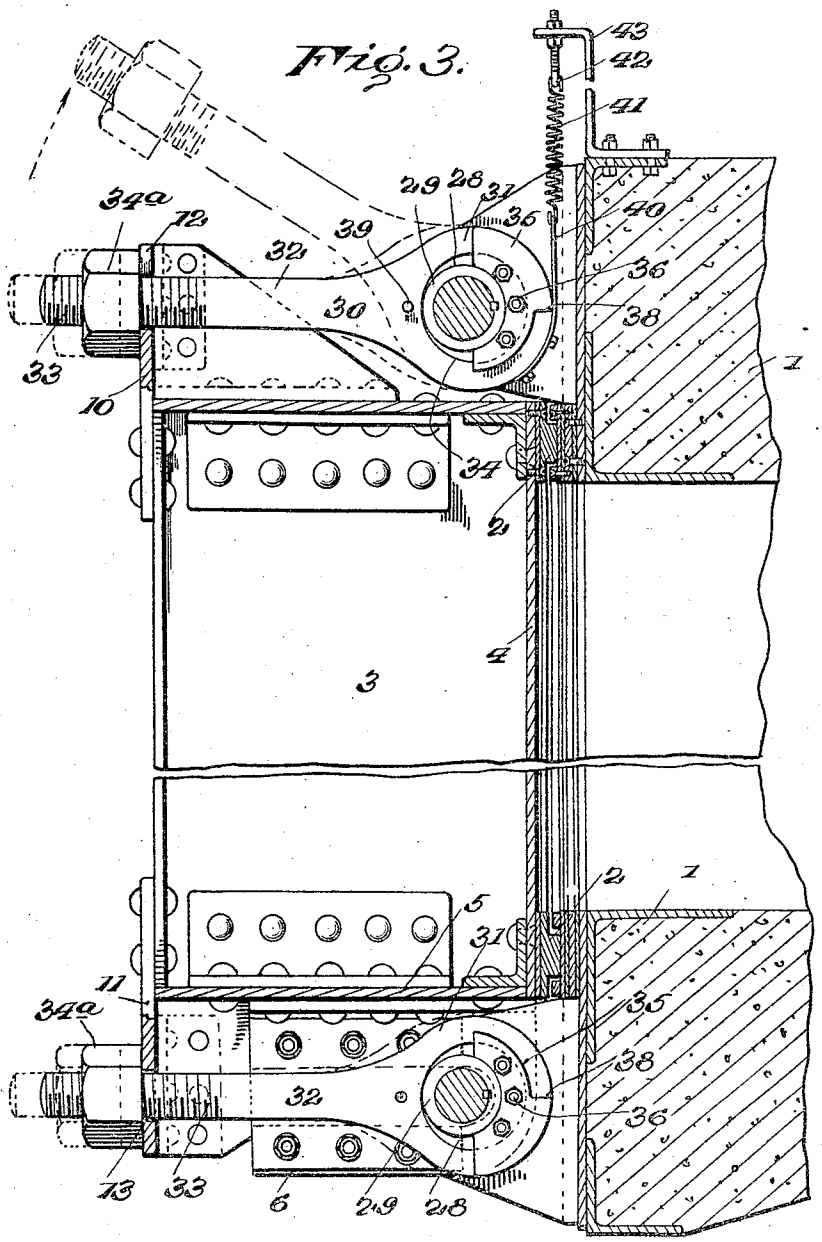
March 30, 1926. 1,579,116

A. KEMPKEY

DOOR OPERATING MECHANISM FOR RETORTS

Original Filed Nov. 5, 1920 3 Sheets-Sheet 2

Fig. 3.



A. Kempkey. INVENTOR.

BY

ATTORNEY.

March 30, 1926. 1,579,116

A. KEMPKEY

DOOR OPERATING MECHANISM FOR RETORTS

Original Filed Nov. 5, 1920 3 Sheets-Sheet 3

Fig. 5.

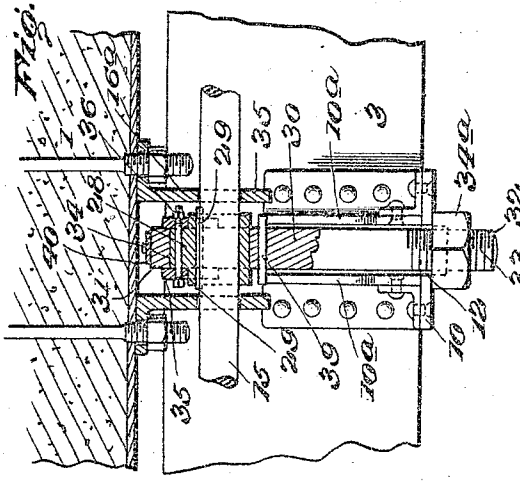


Fig. 7.

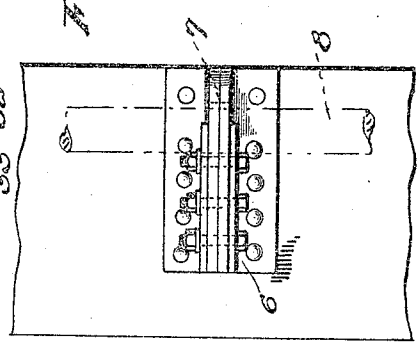


Fig. 4.

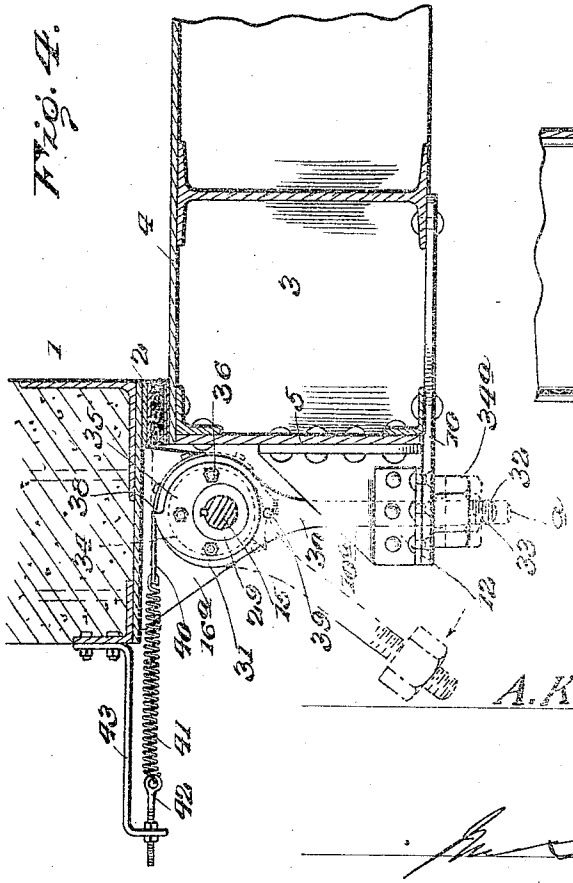
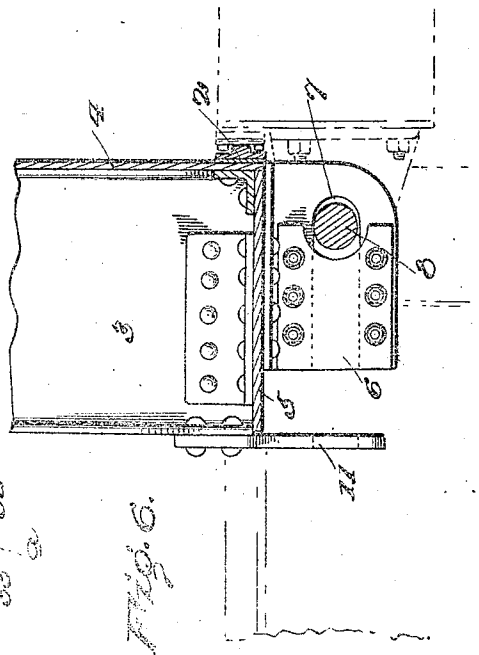


Fig. 6.



A. Kempkey.

INVENTOR.

BY

ATTORNEY.

Patented Mar. 30, 1926. 1,579,116

UNITED STATES PATENT OFFICE.

AUGUSTUS KEMPKEY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO F. K. FISH, JR., OF RENO, NEVADA.

DOOR-OPERATING MECHANISM FOR RETORTS.

Application filed November 5, 1920, Serial No. 422,096. Renewed September 3, 1925.

To all whom it may concern:

Be it known that I, AUGUSTUS KEMPKEY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Door-Operating Mechanism for Retorts, of which the following is a specification.

This invention relates to improvements in door operating mechanism, primarily intended for use in connection with retorts or the like, where an effective seal is an absolute essential.

The prime object of the invention is to provide means including latches, so arranged as to form a permanent part of the retort, and can be so constructed as to permit of a tilting and lengthwise movement when in the operation of locking or unlocking the door to effect the sealing or releasing action.

A further object of the invention is to provide a door latching means including a series of latches, which will permit of adjustment to provide an effective seal at any particular point, and a structure which will readily permit of a yielding action to insure of practical and efficient results.

A still further object of the invention is to provide simple and convenient mechanism for operating the latches in their dual movements in locking or unlocking the door.

The invention also comprehends improvements in the details of construction and arrangement of parts, which will be hereinafter described and particularly pointed out in the claims.

In the accompanying drawings:

Fig. 1 is a front elevation of my improved door.

Fig. 2 is a central vertical section of the same.

Fig. 3 is a similar view on an enlarged scale.

Fig. 4 is a horizontal section.

Fig. 5 is a detail plan view, partially in section of one of the latches.

Fig. 6 is a detail section of the hinge connection.

Fig. 7 is a bottom plan view of the same.

The numeral 1 indicates the end of a retort of any suitable construction, having on its end wall a gasket 2, the outer face of which is preferably formed of lead. 3 indicates a door, shown as constructed of a plate 4, reinforced with I beams, and surrounded by a flange 5. On the rear of the door is a gasket engaging flange, designed to cooperate with the gasket 2 in effecting a sealing contact when the door is closed and latched.

At the bottom of the door and secured to the flange 5, is a hinge member 6, formed with an elongated slot 7, thru which passes a shaft 8, mounted in bearings 9, secured on the front of the retort.

Secured at intervals around the front edge portions of the sides and top of the door are catches 10, and at the bottom edge portion of the door are catches 11. The catches all project outwardly beyond the edges of the door, the catches 10 having open recesses 12, while the catches 11 are formed with openings 13. At the rear of the projecting portion of the catches are spaced apart angle irons 10^a, which with the recesses and openings form seats for latches when the door is in locked position.

At the top of the retort in rear of the front of the door is an upper shaft 14, mounted in suitable bearings and arranged parallel with the shaft 8, and at the sides of the retort in the same plane as shafts 8 and 14, are shafts 15 and 16 supported in bearings 16^a. The shaft 14 is provided at one end with a bevelled pinion 17, which meshes with a bevelled pinion 18, on the end of shaft 15, while the end of shaft 8 is provided with a bevelled pinion 19, which meshes with a similar bevelled pinion 20, on the shaft 16. The shafts 8 and 14 project beyond the sides of the door and are provided with worm gears 21, and meshing with same are worms 22, on a shaft 23, mounted in bearings on the retort. Intermediate the length of shaft 23, is a worm gear 24, and meshing with same is a worm 25, on a shaft 26, the latter having a hand wheel 27.

It will be seen that by this construction when the hand wheel is rotated, the shafts 8, 14, 15 and 16, will be correspondingly rotated, which movement is intended to operate a plurality of latches now to be described.

The latches are substantially therefore alike, but one will be described.

Secured on the shafts, as by keys, are eccentrics 28, each formed on opposite sides with hub portions 29. Mounted on each ec-

centric is a latch 30, comprising a head 31, and a shank 32, the latter being threaded at its outer end at 33. The head is formed with a circular opening 34, while the threaded end 33 receives a nut 34. On the hub portions 29 of each eccentric are two plates 35, secured in place by bolts 36. Each of these plates is formed with an abutment 38. The abutments on the plates at the sides and top of the door cooperate with a transverse pin 39, extending thru the shank, and projecting beyond the surface thereof. These pins however are dispensed with on the latches at the bottom of the door as will presently appear. To the edge of each head 31 of the latches at the sides and bottom of the door, is attached a strap 40, and to this strap is secured one end of a coil spring 41, the opposite end being secured to an eye 42, fastened to a bracket 43, onto the retort. The purpose of this construction is to return the latches to their normal position, when closing the door.

As the latches on the shaft 8 only have a substantial lengthwise movement in the catches, 11, as against a dual movement of the top and side latches, said lower latches do not require the pins 39. However for convenience in manufacture and assembling, the latches are, as above stated, substantially the same construction, save for the pin. It is however advisable to form the plates 35 on the latches at the sides of somewhat greater surface than the corresponding plates on the top latches.

Let it be assumed that the door is in closed position as shown in Fig. 2, and it be desired to unlock it, the hand wheel is rotated, which thru the bevelled gears will rotate the shafts 8, 14, 15 and 16. This will of course rotate the eccentrics and cause an outward or lengthwise movement of the latches in the catches, hence removing the nuts from engagement with the outer surfaces of the respective catches and freeing the door from the retort. When this movement occurs, the door recedes slightly from the retort, due to the relaxing of the pressure and the separation of the packing, the movement being possible by reason of the elongated slots in the hinges.

In the continued rotation of the shafts 14, 15, and 16, and after the nuts have been backed off the catches by the lengthwise movement of the latches, the abutments 38 are timed to contact with the projecting ends of the pins 39, and rock or tilt the latches on their eccentrics. This movement disengages the outer ends of the latches on shafts 14, 15 and 16, from the open recesses in catches 11, as shown in dotted lines at *a* in Fig. 4. This action however only occurs with the latches having the projecting pins 39, on shafts 14, 15 and 16. In the case of the latches on the lower shaft 8, it is not necessary to tilt the ends of the latches, hence they simply move thru the openings in the catches, therefore the eccentrics simply move the latches lengthwise to back off the nuts, the plates having the abutments simply moving without cooperating pins. This simple lengthwise movement of the lower latches is due to the fact that they are supported on the shaft which forms the axis on which the door swings, hence there will be not binding action between the parts in the opening and closing operation, since the latches are free to move on their eccentrics and thru the openings in the catches when the door swings.

In this operation, the springs 41, which are only applied to the top and side latches, are put under tension when the door is opened, so that in the return of the parts to their normal or closed position, the latches will be drawn or tilted into the recesses in the catches, and ready for the successive lengthwise movement of said latches. Obviously as the latches on the lower shaft only have a movement in one direction, it follows that the springs are not necessary.

The door is now free to be opened by mechanism indicated at 50.

When it is desired to close and seal the door, the closing mechanism 50 is operated to rock the door on its hinges toward the retort. When the door reaches a position adjacent the front of the retort and the packing elements about contact, the shafts 8, 14, 15 and 16 are rotated by the hand wheel 27, which of course turns the plates having the abutments, and as the latter return to normal position, the springs tend to pull the latches down into the recesses in the catches to position the nuts in clamping position. While this tilting movement is taking place with the side and top latches, the lower latches are simply withdrawn within the openings in the lower catches. Upon further rotation of the shafts, the abutments separate from the pins 39, and all the latches are drawn inwardly in substantial lengthwise movement, and the nuts impinge the catches and the door is drawn in toward the retort and the sealing action is completed, the elongated slots in the hinges permitting of the door being slightly bodily moved by the catches to form a proper seating of the packing gaskets.

When the parts are in this position, they are automatically locked against movement, and the door cannot be opened except by rotation of the eccentric shafts.

If when the door is closed, it is found that the seal is imperfect at any particular point, the nuts adjacent the leak can be adjusted to increase their frictional engagement with the catches, consequently when the parts are again operated to close the door, a perfect seal will be effected.

As previously mentioned, the plates 35 on the side latches have a greater surface than the corresponding plates on the other latches. The purpose of this construction is to form a support for the heads of the side latches when swung outwardly from the door. This prevents the latches from sagging, consequently the shanks will at all times register with the recesses in the catches.

From the foregoing description, it will be seen that the improved mechanism will effectively latch a retort door, and that the joint between the door and the retort will be sealed to prevent escape of pressure or the like.

What I claim is:—

1. In combination, a door, a frame adjacent the door, a series of catches on each of the edges of the door, a series of latches on the frame, and means for imparting to all of the latches a tilting movement and subsequently a lengthwise movement to cause the latches to engage and bind the catches and move the door in sealing position against the frame.

2. In combination, a frame, a door loosely hinged to the frame, a plurality of catches and latches between each of the edges of the door and the frame, and means for imparting a swinging and subsequently a lengthwise movement of the latches to first seat the latches in the catches and thereafter cause said latches to engage the catches and draw the door toward the frame and effect a sealing connection.

3. In combination, a frame, a door, a plurality of latches and slotted catches between the door and the frame, and means for imparting a swinging and subsequently a lengthwise movement of the latches to cause the latter to first seat in the slots of the catches and thereafter move lengthwise to force the door against the frame and effect a sealing connection.

4. In combination, a door, a frame, a plurality of shafts on the frame, a plurality of eccentrics on the shafts, a plurality of latches operated by the eccentrics, a plurality of catches on the door which the latches engage, means for creating relative movement between the latches and the catches to separate same, and means for operating the shafts.

5. In combination, a door, a plurality of catches on the door, said catches having recesses at their ends, a frame, a plurality of eccentric operated latches on the frame to engage in the recesses to form a binding action to lock the door against the frame, and means for rocking the latches to seat or remove the same in or from the recesses.

6. In combination, a frame, a plurality of shafts on the frame, a plurality of eccentrics on the shafts, a plurality of latches operated lengthwise by the eccentrics, means carried by the eccentrics to tilt the latches in one direction, and tension means for returning the latches to normal position after having been tilted.

7. In combination, a frame, a plurality of shafts on the frame, a plurality of latches movable lengthwise and tiltable on certain of the shafts, other latches movable lengthwise only on another of the shafts, a door, catches on the door with which the latches cooperate, and means for operating the shafts to operate the latches.

8. In combination, a frame, a shaft on the frame, an eccentric on the shaft, a latch mounted on the eccentric and movable lengthwise thereby, the latch having a pin, the eccentric having an abutment to engage the pin and tilt the latch on the eccentric, a spring to return the latch to normal position, and means for operating the eccentric.

9. In combination, a door and a frame, sealing and locking mechanism between a plurality of edges of the door and frame including a plurality of latches, each having a tilting and subsequently a lengthwise movement, means common to all of the latches to successively tilt and impart thereafter the lengthwise movement, and a series of catches with which the latches cooperate.

10. In combination, a door and a frame, sealing and locking mechanism between the door and frame including two sets of latches, one set of latches having a successive tilting and lengthwise movement of the other set of latches having a lengthwise movement only, common means for simultaneously operating all the latches, and a plurality of catches with which the latches cooperate.

11. In combination, a frame, a door, a plurality of latches and catches between all of the edges of the door and the frame, means including eccentrics for operating all the latches in a lengthwise direction, said means including a device cooperating with certain of the latches only to impart to the latter a swinging movement, and independent means for returning the latches to position for the first-mentioned means to cooperate therewith.

In testimony whereof I affix my signature.

AUGUSTUS KEMPKEY.