

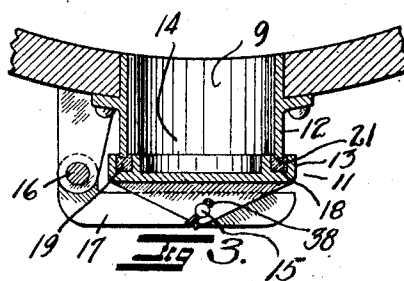
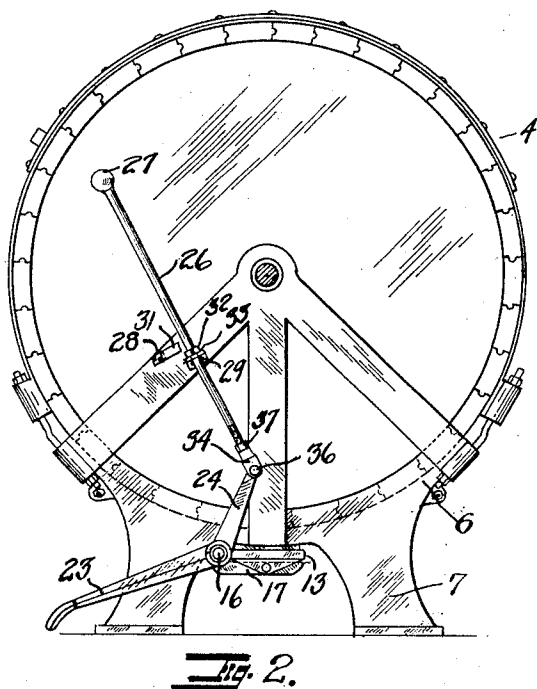
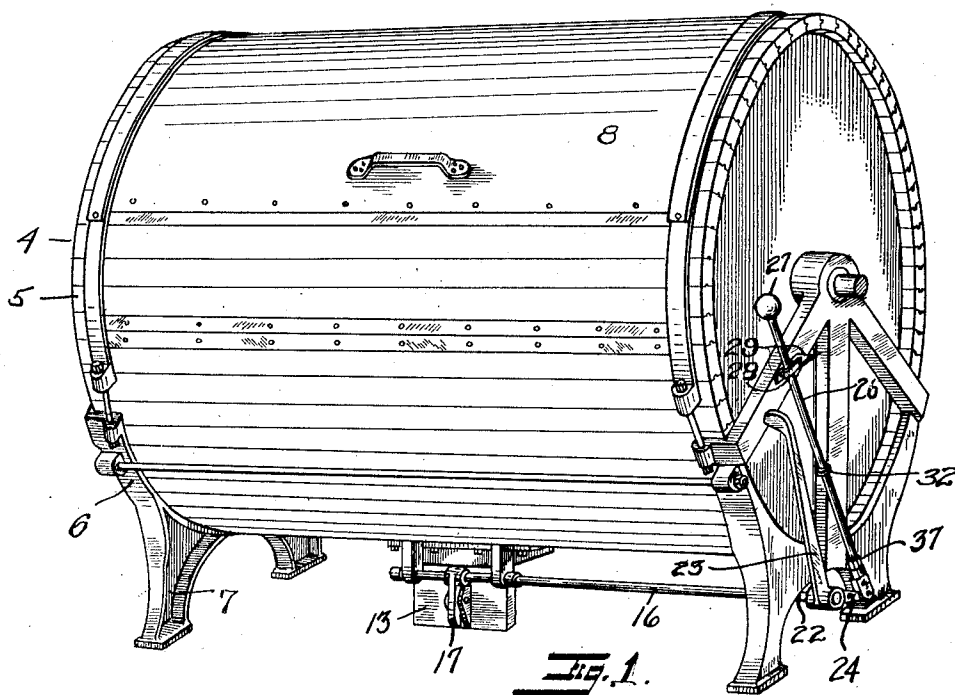
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J. C. ROSS

1,733,672

WASHING MACHINE DRAIN VALVE MECHANISM

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WASHING MACHINE DRAIN-VALVE MECHANISM

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My invention relates to a drain valve and an operating mechanism therefor which are particularly arranged for use on power operated washing machines.

An object of the invention is to provide a device of the character described, by which a complete and unhindered discharge of fluid may be effected in a minimum of time.

Another object of the invention is to provide a device of the character described which is pedally operated and involves the use of a minimum number of parts.

A further object of the invention is to provide a mechanism of the character described having means by which the necessary seating pressure of the valve may be easily produced notwithstanding the fact that the valve itself may be located at some relatively inaccessible point of the machine.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of my invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that I do not limit myself to the showing made by the said drawings and description, as I may adopt variations of the preferred form within the scope of my invention as set forth in the claims.

Referring to said drawings,

Figure 1 is a perspective view of the outer casing of a washing machine having the drain mechanism of my invention installed thereon.

Figure 2 is an end view of the washing machine showing the valve operating mechanism.

Figure 3 is a fragmentary transverse sectional view of the machine taken through the valve.

In draining the fluid tanks of washing machines, it is particularly desirable that the fluid be allowed to escape quickly and freely so that the rush of escaping fluid will carry the various solids, such as dirt and lint, with it and thereby leave the tank as clean as possible. Furthermore, such valves should be of simple structure and are desir-

ably opened or closed with a minimum of time and effort on the part of an operator. The present invention, it will now be noted, is particularly designed to satisfy the foregoing requirements and is of such design that it may be applied to various types of tanks with equal readiness.

The valve mechanism of my invention is here shown operatively associated with a washing machine 4 of the rotary cylinder type having the axis of the cylinder and tank horizontal. As illustrated, the fluid tank 5 is shown mounted on supports 6 provided with legs 7, the tank being provided with a circumferentially displaceable cover 8 whereby access to the interior thereof is permitted.

Preferably positioned at the lowest point of the tank in operative relation to a substantially rectangular drain outlet 9 provided therein is a valve 11. As here shown, the valve 11 comprises a seat block 12 secured to the tank and a plate 13 arranged to provide a closure for the valve block port 14, the latter being preferably of uniform section throughout its length. Journalled in the arm 17 at a side of the port 14, and preferably extending parallel to the tank axis, is a shaft 16, such shaft having the arm 17 adjustably set thereon and to the free extremity of which the plate 13 is pivotally secured by means of a loose pin 15 in such manner as to permit a slight pivotal movement of the plate about an axis parallel to the shaft axis. Provided in the seat engaging side of the plate 13 is a gasket receiving groove 18 in which is positioned a gasket 19 preferably formed of resilient material, it now being noted that the seat 21 of the block 12 is so shaped as to engage the gasket 19 and partly engage in the groove 18 when the valve is closed. It will now be particularly noted that the shaft 16 provides, in effect, a hinge pin for the closure plate 13 and that the axis of the shaft is preferably coplanar with the plane of the seat closing plate 13 when the valve is closed to provide a liquid tight joint. In this manner, the final valve positioning movement of the arm 17 involves a minimum of transverse movement of the

gasket across the seat and the pressure against the gasket is entirely perpendicular thereto.

It will now be clear that the closing and opening of the valve provided may be effected upon the appropriate rotation of the shaft 5 16 which carries the closure plate 13, the shaft itself serving as a hinge pin for the plate. Means are therefore provided for effecting the appropriate rotation of the shaft 10 16 and for holding it in set position when the plate is fully seated against the valve seat 21. As here shown, the shaft 16 is extended beyond the end of the tank and is preferably additionally journaled, by means not shown, 15 in the support 6 through the plane of which it passes. Adjustably set on the shaft extremity 22 is a pedal lever 23, which lever is preferably so positioned on the shaft as to be substantially horizontally disposed when the 20 valve is closed so that a closure pressure may be exerted on the valve with a high degree of mechanical advantage.

Means are provided for holding the valve closed after the primary closing thereof by 25 means of the pedal. Removably set on the shaft end 22 is a second lever 24, such lever being generally oppositely disposed with respect to the pedal lever 23. Pivotally secured to the extremity of the lever 24 for limited movement in the plane of movement 30 thereof is a rod 26, such rod being conveniently provided at its free extremity with a handle 27. The rod 26 is preferably guided for reciprocation generally longitudinally of itself in a direction extending upwardly and 35 forwardly of its pivot point, so that the handle 27 thereof will be accessible from the front side of the tank. Guidance of the rod in its various positions is effected by means of cooperating guide members 28 and 29, such 40 members being here shown fixed on the support 6 forwardly and rearwardly respectively of the rod, the member 28 being provided with a rearward extension 31 whereby the 45 movement of the rod may be confined to the plane of movement of the lever 24.

It will now be noted that when the valve is closed, the rod 26 will have been raised to its uppermost position, so that fixing the rod 50 in such position will operate to hold the valve plate seated. Means are therefore provided for releasably securing the rod in such position, and as here shown such means comprises the provision of a stop 32 on the rod 55 arranged to bear on the upper face 33 of the guide member 29 when the valve is closed. As here disclosed, the stop 32 is in the form of a ring encircling the rod, and the guide member 29 is notched from its forward edge 60 to receive the rod so that a comparatively large part of the lower face area of the ring stop 32 may seat on the face 33.

Setting of the valve in closed position, it will now be noted, is effected by depressing 65 the foot lever to close the valve slightly more

tightly than necessary, at which time the stop 32 is above and forwardly of the face 33, swinging the rod rearwardly about its pivotal connection to the lever 24 to a position above the face 33, and then releasing the 70 foot lever to permit the stop to seat on the face 33. It will now be noted that the seating of the stop is made possible both by means of the depth and compressive resiliency of the valve gasket and by the inherent torsional 75 resiliency of the material of which the shaft is comprised, the latter being preferably of such size as to provide such resiliency, and thereby assist in holding the valve plate seated to provide a sealed joint when the stop 80 is seated.

Release of the valve is accomplished by bearing down on the foot pedal lever to unseat the stop and thereby permit the rod to fall or be pulled forward, whereupon release 85 of the lever permits the opening of the valve.

To provide for adjustment which may be necessary on account of variation in the gasket thickness or in the torsional resilience of the shaft, the rod 26 is here shown connected 90 to the lever arm 24 by means of its threaded engagement with a clevis 34 of usual form which is pivotally secured to the arm by means of a pin 36, a lock nut 37 being utilized to fix the rod in adjusted relation to the clevis. 95 In this manner, the various lever arms may be left in set position on the shaft, and the necessary adjustment is arranged to be effected entirely at the operating lever, it being noted that such lever is preferably dis- 100 posed to be readily accessible, as at the end of the tank as here shown, so that control of the valve positioning is arranged to be effected at a point spaced from the valve and more accessible than is the valve. 105

With the construction now described, an angular displacement of the valve from its seated position of as much as 90 degrees may be effected, so that liquid may escape through the valve port 14 without hindrance, a feature which has been lacking in the valves heretofore usually used for the purpose. Furthermore, by reason of the loose pin connection of the valve plate to its arm, the former member may be disconnected merely 110 by removing the cotter key 38 from the pin and then removing the pin, thus permitting the removal of the plate with a minimum of operations in a minimum time. And it will be further obvious that the structure provided is extremely simple and inexpensive to manufacture, and that it may be as readily applied to other types of washer tanks than that here shown. 115

I claim:

1. In a washing machine tank having a drain port, a hingedly mounted member arranged to be swung to provide a closure for said port, means pedally operative to effect the positioning of said member to close said 130

port, and releasable means rendered operable by and upon the disposal of the member in port-closing position to hold the latter member in said latter position.

and means operative to engage said rod when said valve is closed whereby the opening of said valve will be prevented, said rod comprising threadedly engaged sections for varying the effective length thereof whereby the closure pressure of said valve may be adjusted. 70

In testimony whereof I have hereunto set my hand at Oakland, California, this 9th day of July, 1926.

JOHN C. ROSS. 75

2. In a washing machine tank having a drain port, a drain valve mechanism comprising a rotatable shaft, a normally inoperatively disposed closure member for said port carried by said shaft, means operable to effect the rotation of said shaft to position said member to close said port, and releasable means rendered operable by said first means to prevent the rotation of said shaft when said member is disposed to close said port.

3. In a washing machine tank having a vertically directed drain port, a normally inoperatively disposed closure member for said port, a horizontally disposed shaft arranged upon the appropriate rotative positioning thereof to operatively dispose said member to close said port, an arm fixed to and extending from said shaft, a rod pivotally fixed to said arm and extending upwardly and forwardly of the pivot point thereof, means providing a guideway for said rod permitting limited movement thereof in the plane of movement of said arm, and through which said arm is arranged to be substantially longitudinally projected through said guideway during the movement of said member to close said port, means on said rod and guide means releasably engageable to prevent the retractive movement of said rod through said guideway when said member is in fully operative position. 80

4. In a washing machine tank having a drain valve, a horizontally disposed shaft arranged upon the proper rotative positioning thereof to effect a closure of said valve, a rod fixedly associated with said shaft and arranged to be longitudinally reciprocated upon the rotation of said shaft, a member providing a guideway for said rod, and cooperating means on said rod and member means manually engageable to prevent the retractive movement of said rod through said guideway when said member is in fully operative position. 85

5. In a washing machine tank provided with a drain port having a valve seat at the outer extremity thereof, a closure member arranged to resiliently engage said seat from without said tank, releasable means arranged to hold said member seated, and adjusting means associated with said latter means whereby the seating pressure of said member may be varied. 90

6. In a washing machine tank having a drain valve arranged for a resilient closure thereof, a shaft arranged upon the proper rotative positioning thereof to effect a closure of said valve, a rod independent of said valve fixedly associated with said shaft and arranged to be longitudinally reciprocated upon the rotative oscillation of said shaft, 100

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