April 16, 1940. J. MIKULASEK 2,197,558

COMBINATION DRAIN AND GEARSHIFT FOR WASHING MACHINES

Filed July 17, 1936 2 Sheets-Sheet 1

Fig. 1

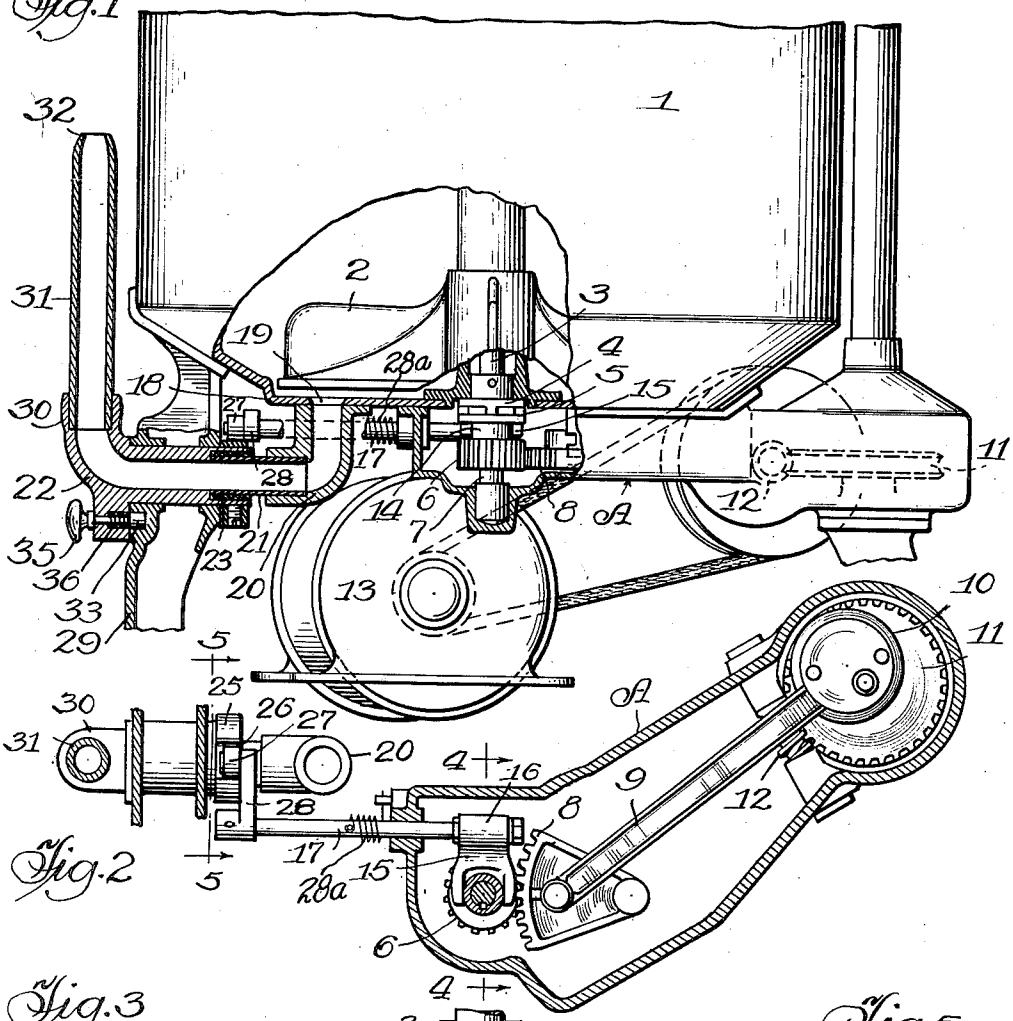


Fig. 2

Fig. 3

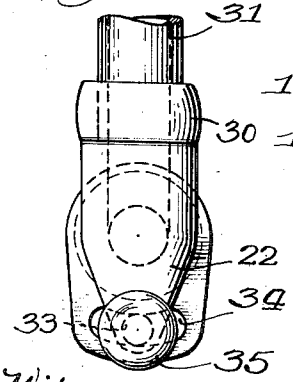


Fig. 4

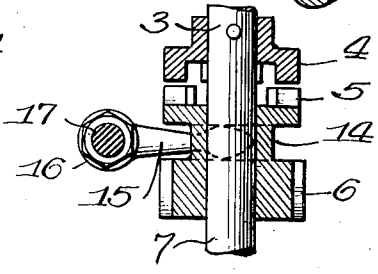
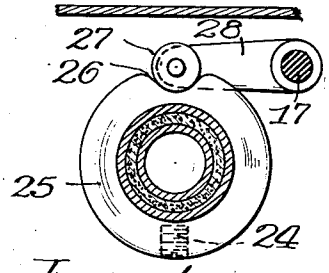


Fig. 5



Witness:
Chas. K. Kousek.

Inventor,
John Mikulasek,
Parkinson & Lane. Attys.

April 16, 1940. J. MIKULASEK 2,197,558

COMBINATION DRAIN AND GEARSHIFT FOR WASHING MACHINES

Filed July 17, 1936 2 Sheets-Sheet 2

Fig. 6

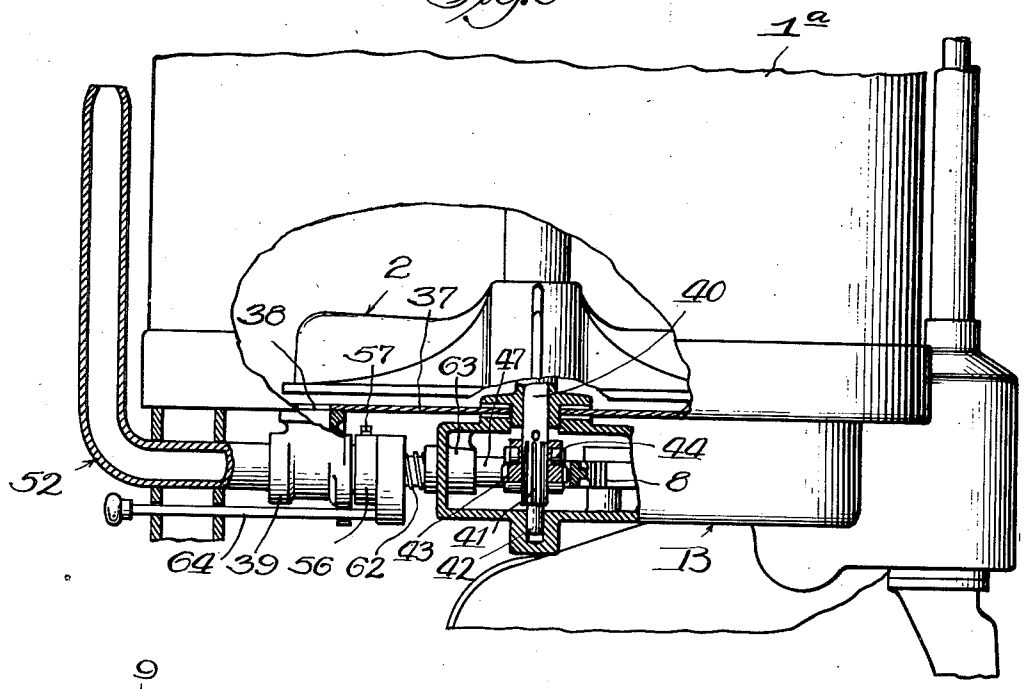


Fig. 7

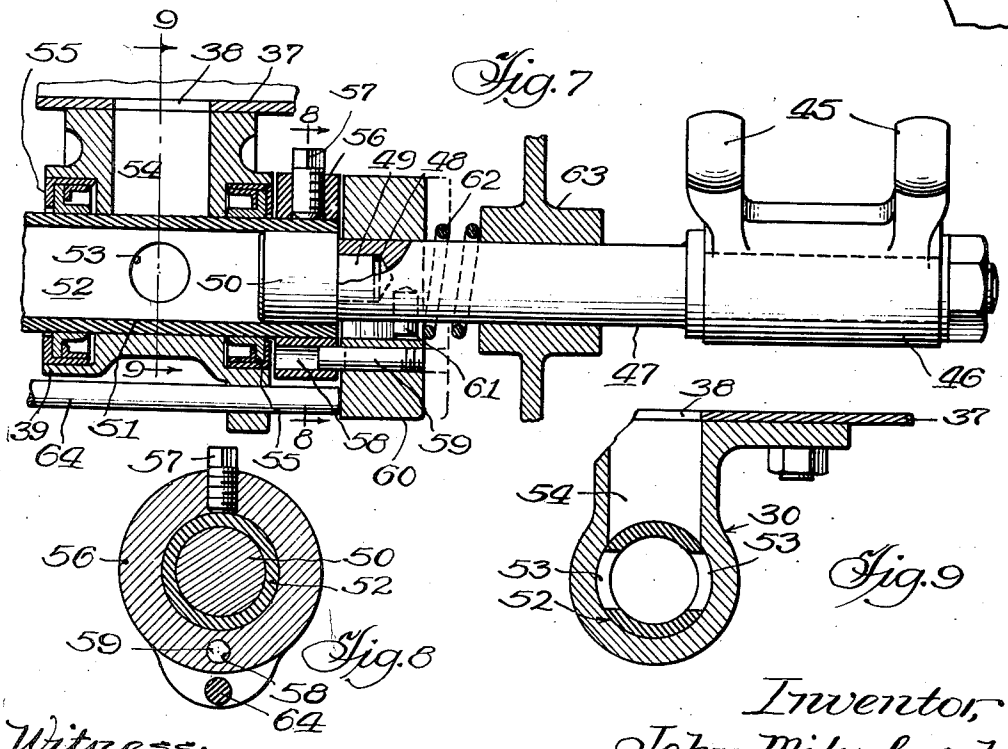


Fig. 8

Fig. 9

Witness:
Chas. L. Konrad

Inventor,
John Mikulasek
Parkinson & Lane Attys.

Patented Apr. 16, 1940 2,197,558

UNITED STATES PATENT OFFICE

2,197,558

COMBINATION DRAIN AND GEARSHIFT FOR WASHING MACHINES

John Mikulasek, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa, a corporation of Delaware

Application July 17, 1936, Serial No. 91,075

8 Claims. (Cl. 68—208)

The present invention relates to a washing machine, and more particularly to a novel drain and gearshift mechanism.

Among the objects of the present invention is to provide a novel means and mechanism for draining the washing fluid from a washing machine, said means and mechanism also operating to clutch or declutch the agitator or impeller shaft with the drive mechanism.

Another object of the present invention is the provision of a lever in the form of a hollow or tubular member pivotally mounted on a horizontal axis, and adapted when moved to one position, to clutch the agitator and drive member, and when moved to another position to declutch these members, and when moved to still another position, to drain or empty the contents of the tub.

A further object of the invention is to provide a tubular member so constructed and arranged that when such member is in a vertical position, the agitator shaft is clutched with the drive mechanism, and when moved through a predetermined arc away from the vertical, it declutches the agitator shaft with the drive mechanism, and when said member is moved through a greater arc in either direction, the contents of the tub are drained through the opening in this member.

A still further object of the present invention is to provide a new and novel construction of drain mechanism for readily draining and emptying the contents of the tub.

Yet another object is the provision of a new and novel construction of gearshifting mechanism for connecting or disconnecting the agitator or impeller shaft with the drive mechanism.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear, and as are inherently possessed thereby.

The invention further resides in the combination, construction and arrangements of parts illustrated in the accompanying drawings, and while there is shown therein a preferred embodiment, it is to be understood that the same is susceptible of modification and change, and comprehends other details and constructions, without departing from the spirit of the invention.

In the drawings:

Fig. 1 is a view, part in side elevation and part in vertical cross section of the novel construction.

Fig. 2 is a view, part in plan and part in horizontal cross section, of the drain and gearshifting mechanism.

Fig. 3 is a fragmentary view in front elevation of the drain and gearshift lever.

Fig. 4 is a view in vertical cross section taken on the line 4—4 of Fig. 2, but with the gear housing removed.

Fig. 5 is a view in vertical cross section taken on the line 5—5 of Fig. 2.

Fig. 6 is a view similar to Fig. 1, but of an alternate construction.

Fig. 7 is a fragmentary enlarged view in vertical cross section of the drain and gearshifting mechanism shown in Fig. 6.

Fig. 8 is a view in vertical cross section taken on the line 8—8 of Fig. 7.

Fig. 9 is a view in vertical cross section taken on the line 9—9 of Fig. 7.

Referring more particularly to the disclosure in Figs. 1 to 5 of the drawings, the novel embodiment of the invention is shown in connection with a washing machine provided with a tub 1 in which is located an agitator or impeller 2 mounted upon an oscillating or rotating shaft 3. The tub may be of any desired shape or contour to cooperate with the agitator or impeller in the washing action.

The agitator shaft 3 is preferably provided at its lower end with a clutch member or face 4 suitably keyed or pinned thereto, while a complementary clutch member or face 5 is formed or provided on a pinion 6 loosely and slidably mounted on the lower end 7 of the agitator shaft, and adapted to be oscillated or rotated by a gear segment 8 in meshing engagement therewith. Suitable operating mechanism such as a pitman arm or rod 9 oscillated by a crank or eccentric 10 on a worm wheel 11, is in mesh with and rotated by a worm 12. This mechanism when driven by the motor 13 or other prime mover is adapted to oscillate the gear segment. A housing or casing A encloses this operating mechanism. The segment 8 in turn oscillates the pinion 6 and when the members 4 and 5 are in clutching engagement, drives the agitator shaft 3 and oscillates the agitator.

In order to clutch and declutch the pinion 6 with the agitator shaft, this pinion is provided with an annular groove 14 which receives the bifurcations 15, 15 of a shifter member 16 keyed or rigid upon a shifter shaft 17, whereby a rocking of this shaft will in turn rock the member 16 and raise and lower the pinion 6.

The invention comprehends a new and novel means and mechanism for rocking the shifter

shaft, and which combines therewith a novel drain mechanism. As more clearly disclosed in Fig. 1, the bottom or base 18 of the tub is provided with a drain opening 19 leading to a drain nipple 20 suitably fixed or connected to the bottom or base 18. Connected to this nipple is one end of a drain pipe or tube 21, the other end being connected to a rotatable drain elbow 22 by means of a stuffing box 23. Suitably mounted upon the outer circumference of the elbow 22 by means of a set screw or the like 24, is a cam member 25 having a well or depression 26. Over the profiled face of the cam operates a follow-up roll 27 preferably pivoted and mounted on a rocker arm 28 which in turn is keyed or fixed upon the shifter shaft 17. A spring or the like 28a may be provided to cause the roll 27 to follow the contour of the cam and seat in the depression or well 26.

The drain elbow 22 in the present embodiment is shown as rotatably mounted in a leg or support 29 of the machine. To the outwardly extending end 30 of this elbow is mounted a drain-tube 31 having a reduced discharge end or nozzle 32 for draining off the contents of the tub.

When the tub is filled to the proper height with washing liquid and the proper amount of clothes for efficient washing, the drain tube which is normally maintained out of vertical position in which the agitator is declutched and inoperative, is then moved into a vertical position with the roller 27 seated in the well or depression 26. This arc of travel of the drain tube is normally limited by the movement of the pin or plunger 33 in the arcuate slot 34. When it is desired to again declutch the drive mechanism and agitator shaft, the drain tube is again moved to the right or left to rotate the cam 25 and force the follow-up roll 27 out of the well or depression 26 to thereby move the rocker arm 28 and the shifter shaft 17 in a clockwise direction to lower the shifter member 16 and clutch face 5 out of clutching engagement.

To drain the tub, the pin or plunger 33 is retracted or withdrawn by a knob 35 against the compression of the spring 36 which acts to force the pin or plunger into seating engagement. When the pin or plunger has been withdrawn, the drain elbow 22 may be rotated through an arc of 90° or more to permit the tub to drain by gravity.

In Figs. 6 to 9 inclusive there is disclosed an alternate construction in which the tube 1a is shown as provided with a substantially flat bottom 37 formed with a drain opening 38 leading to a hollow bracket or nipple 39 suitably bolted or mounted on the tub bottom. In this form, the agitator shaft 40 is shown as splined at 41 with its lower end reduced at 42 and seating in a bearing formed in the housing or casing B.

Upon the splines 41 is slidably mounted a pinion 43 adapted to be raised and lowered into and out of meshing engagement with the gear segment 8. This pinion is provided with an annular groove 44 for receiving the bifurcations 45, 45 on the shifter member 46 fixed or mounted upon the shifter shaft 47. This shaft at its outer end is formed with a recess 48 adapted to receive the reduced end 49 of a centering plug 50 held in the inner end of the horizontal section 51 of the drain member 52. Thus the shifter shaft and drain section 51 are always maintained in alignment.

The drain member or tube 52 adjacent its inner end is provided with opposite discharge openings 53, 53, adapted to be brought into registry with the outlet 54 formed in the hollow bracket or nipple 39, when the drain member is rotated to the right or left. As shown in Fig. 9, the outlet is opened for complete discharge when the drain member is moved through an angle of approximately 90°. In order to seal the joint between the drain tube and bracket, I have provided the annular liquid seals 55 consisting of interlocking or telescoping packings of leather or other suitable material.

In order to shift the pinion 43 into or out of meshing engagement with the gear segment 8 by means of the drain member 52, the section 51 of this member is provided with a coupling ring 56 secured thereon by means of a set screw 57. This ring is provided with an index hole 58 adapted to receive an index pin 59 carried by a collar 60 slidably mounted on the shifter shaft 47, but locked thereon for rotation by means of a pin 61. A spring 62 seating against a stationary bearing 63 for the shaft 47, and against the collar 60, normally forces the collar outwardly and into locking engagement whereby the index pin 59 is received in the index hole 58. At such time, a movement of the vertical part of the drain member in a counter-clockwise direction, rotates the shifter shaft 47 to raise the pinion 43 into meshing engagement with the gear segment 8.

When it is desired to drain the tub, it becomes necessary to uncouple the coupling ring 56 from the collar 60 so that the drain member may be moved through an arc of 90° or more. This is accomplished by means of a push rod 64 which when pushed inwardly forces the collar 60 rearwardly against the spring 62 to remove the index pin 59 from clutching engagement with the ring 56. At such time the drain tube may be rotated through any desired arc to drain the tub by gravity.

From the above description and the disclosure in the drawings, it will be readily apparent that the invention comprehends a novel means and mechanism for both draining the washing liquid and clutching and declutching the drive mechanism with the agitator.

Having thus disclosed the invention, I claim:

1. In a washing machine having a tub and a washing member operable therein, drive mechanism for the washing member, means for clutching the drive mechanism to the washing member, a combined clutch actuating device and drain for controlling drainage of the tub contents and comprising a hollow drain member rotatably mounted on the tub and communicating with the tub for draining therethrough the liquid content, and interengaging parts on the drain member and clutch means for actuating the clutch means upon rotation of the drain member.

2. In a washing machine provided with a tub and a washing device operable therein, drive mechanism for the washing device, means for selectively clutching and declutching the device with the drive mechanism, a hollow member rotatably mounted on the machine and communicating with the tub for controlling drainage of the tub contents, and means on the hollow member and engaging and actuating the clutch means so that rotation of the member through a sufficient arc causes declutching of the drive mechanism from the device and permits the tub to drain through the hollow member by gravity.

3. In a washing machine having a tub for holding washing liquid and a washing device operable therein, drive mechanism for the de-

vice, means for selectively clutching and declutching the drive mechanism with the device, and a combined clutch shifting mechanism and drain including a tubular member movably connected to the tub bottom, said member and clutching means being so constructed and arranged that when said member is positioned vertically it will actuate the clutching means to clutch the drive mechanism with the device, and when moved through a relatively small arc it will actuate the clutching means to declutch the drive mechanism from the device and when moved through a relatively great arc, the washing liquid from the tub will drain therethrough.

4. In a washing machine having a tub for holding washing liquid and a washing device operable therein, drive mechanism for the device, means for selectively clutching and declutching the drive mechanism with the device, a hollow L-shaped drain member rotatably connected to the bottom of the tub for controllably draining the washing liquid therethrough and a cam mounted on the drain member for actuating the clutch means upon rotation of the drain member.

5. In a washing machine having a tub for holding washing liquid and a washing device operable therein, drive mechanism for the device, means for selectively clutching and declutching the drive mechanism with the device, a hollow L-shaped drain member rotatably connected to the bottom of the tub for controllably draining the washing liquid therethrough and means mounted on the drain member for actuating said clutch means upon rotation of the drain member.

6. In a washing machine having a tub and a washing device operable therein, drive mechanism for the device, means for clutching the drive mechanism to the device, a hollow member for controlling drainage of the tub contents therethrough and rotatably mounted on the tub, interengaging parts on the drain member and clutch means for actuating the clutch means upon rotation of the drain member, and means adapted to normally limit the arc of travel of the drain member.

7. In a washing machine having a tub and a washing device operable therein, drive mechanism for the device, means for clutching the drive mechanism to the device, a hollow member for controlling drainage of the tub contents therethrough and rotatably mounted on the tub, interengaging parts on the drain member and clutch means for actuating the clutch means upon rotation of the drain member, the drain member when moved into a substantially vertical position actuating the clutch means into clutching position and when moved therefrom through an angle of approximately 90° or more, declutching the clutch means and draining the liquid content of the tub.

8. In a washing machine having a tub and a washing member operable therein, drive mechanism for the washing member, means for selectively clutching and declutching the drive mechanism with the washing member, a hollow member movably mounted on the tub and through which the tub is drained, means for operating the clutch comprising a shaft, a bifurcated member mounted on one end thereof and operatively connected with said clutch means, a roller on the other end of said shaft, and a cam operated by said drain member, said cam being so located with respect to said roller that movement of the cam will move the roller to rotate the shaft and operate the clutch.

JOHN MIKULASEK.