March 18, 1941. W. W. WALKER 2,235,094

WASHING MACHINE

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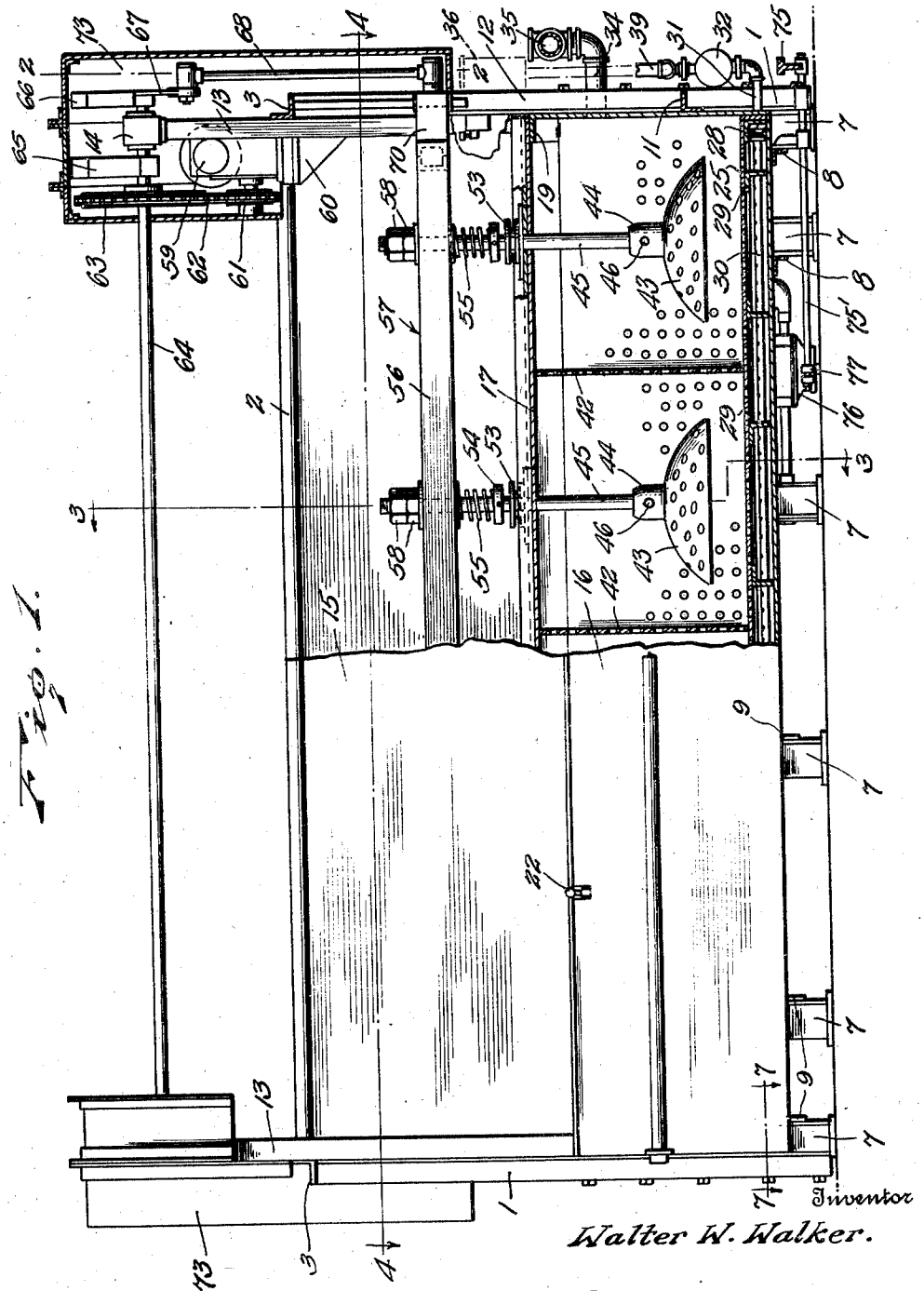


Fig. 1.

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WASHING MACHINE

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Fig. 6.

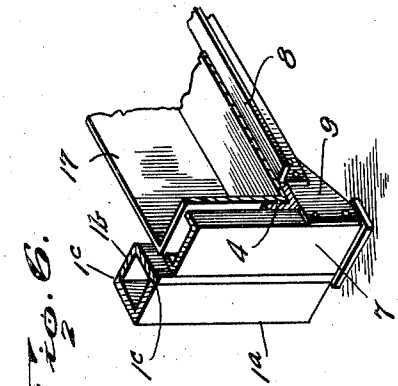


Fig. 7.

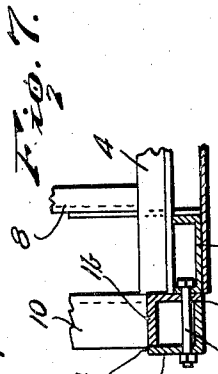


Fig. 8.

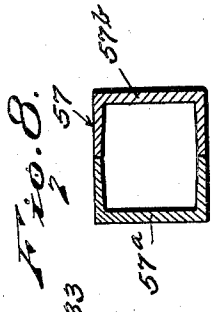
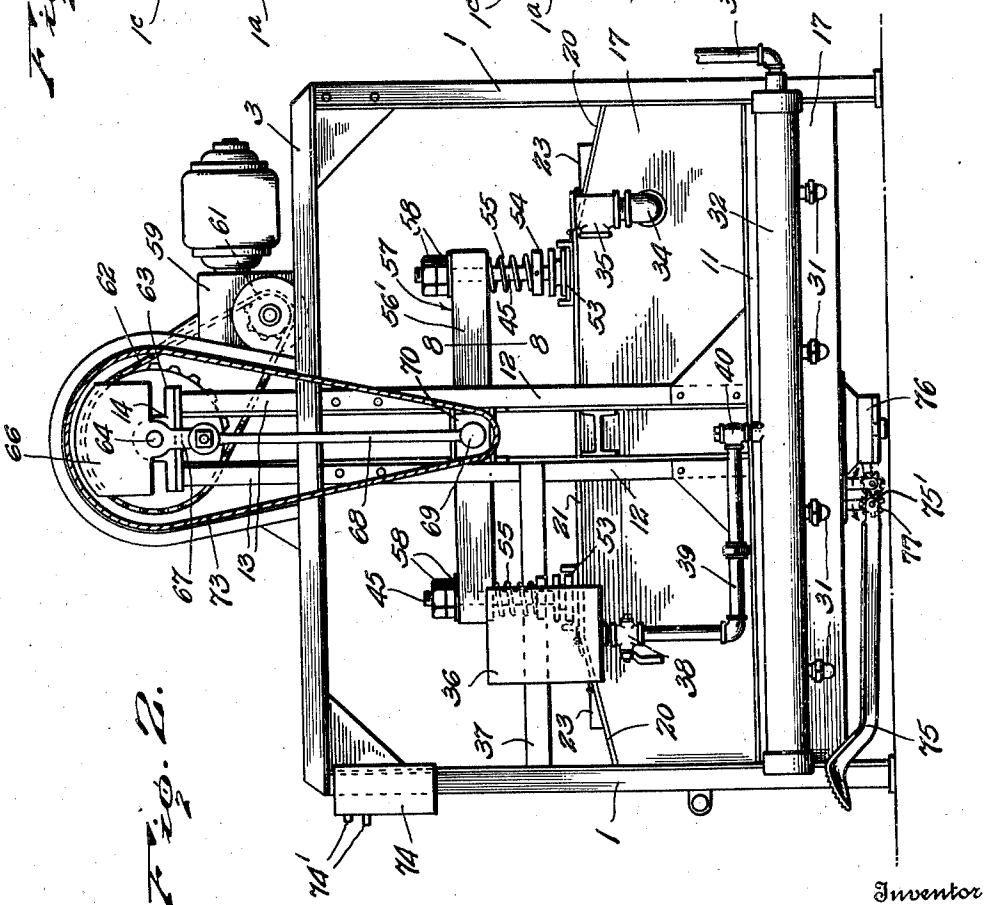


Fig. 2.



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WASHING MACHINE

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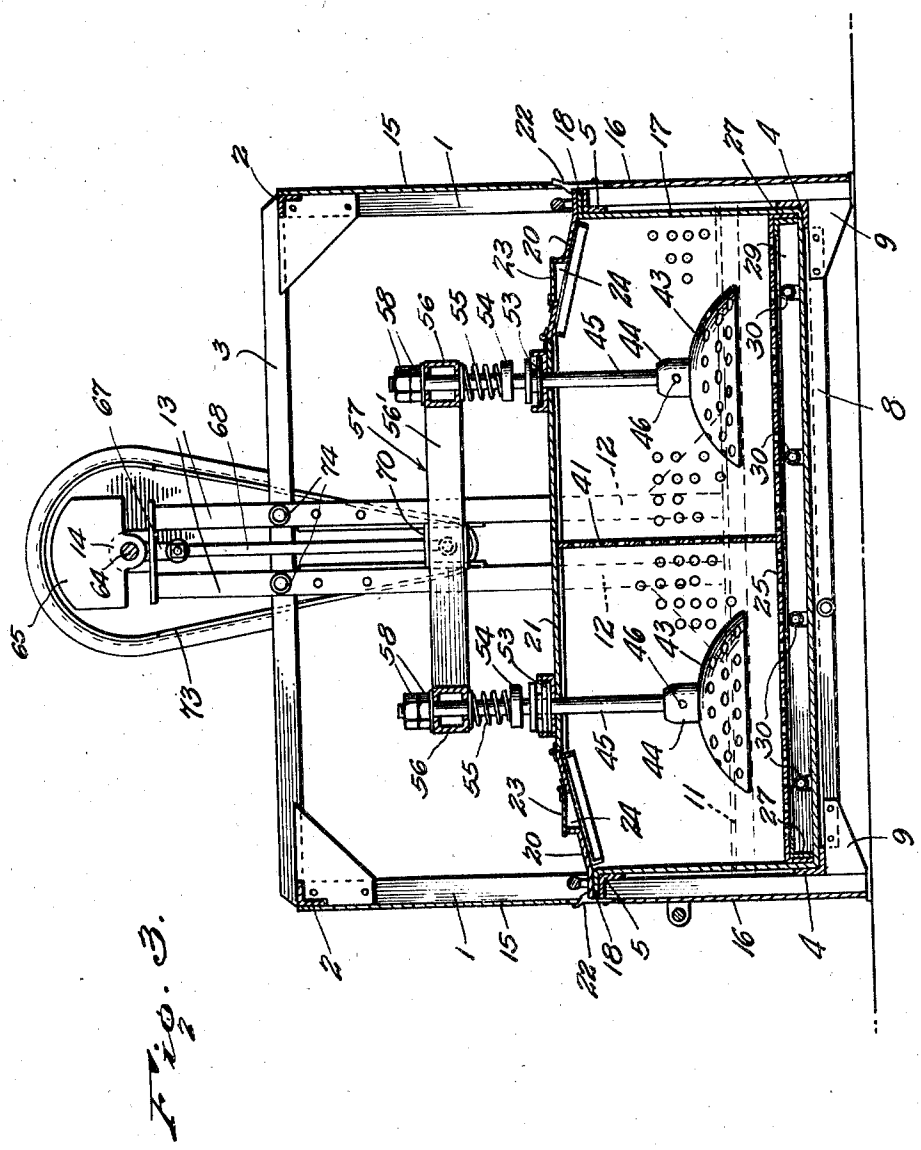


Fig. 3.

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WASHING MACHINE

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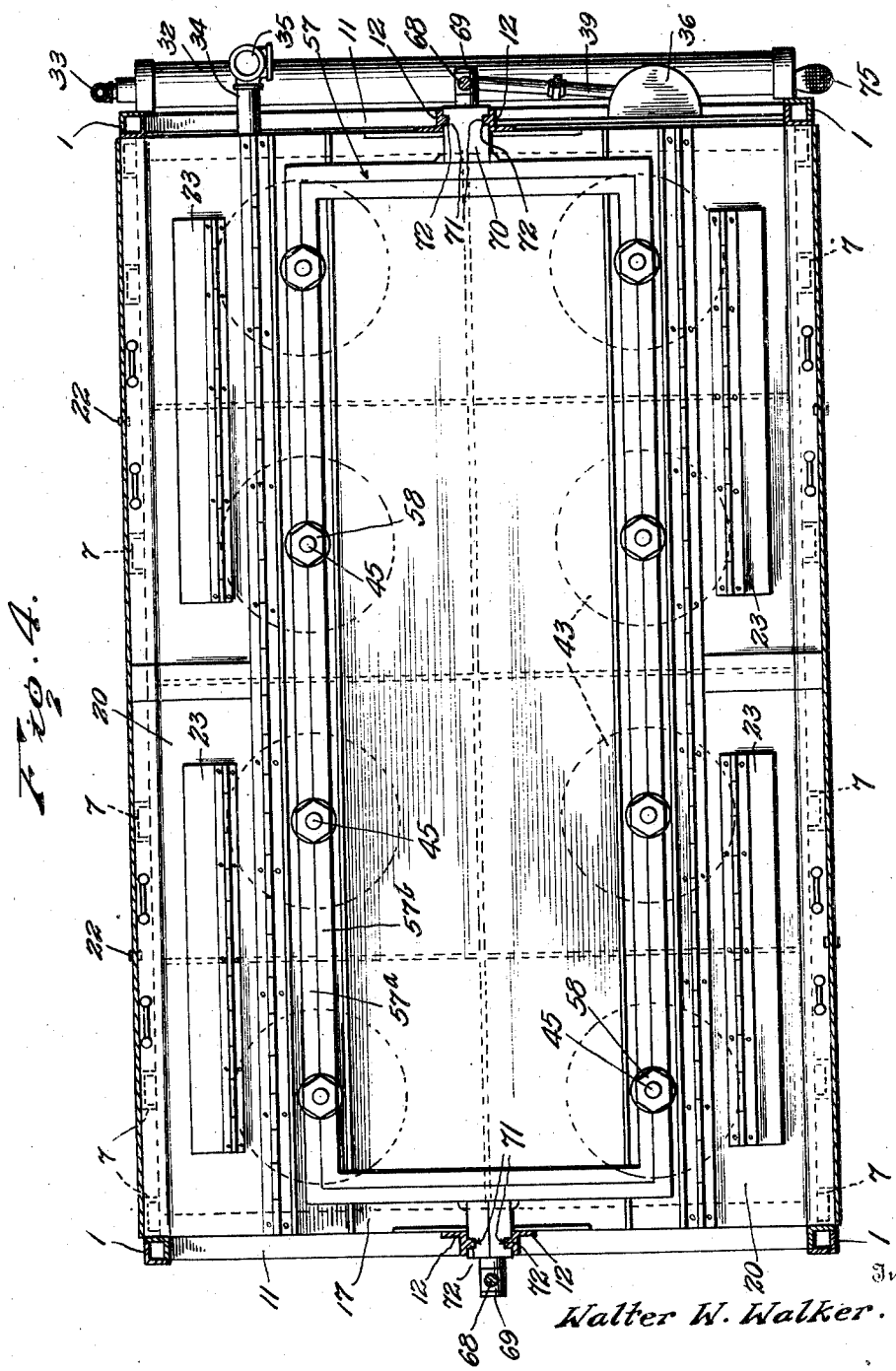


Fig. 4.

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March 18, 1941. W. W. WALKER 2,235,094

WASHING MACHINE

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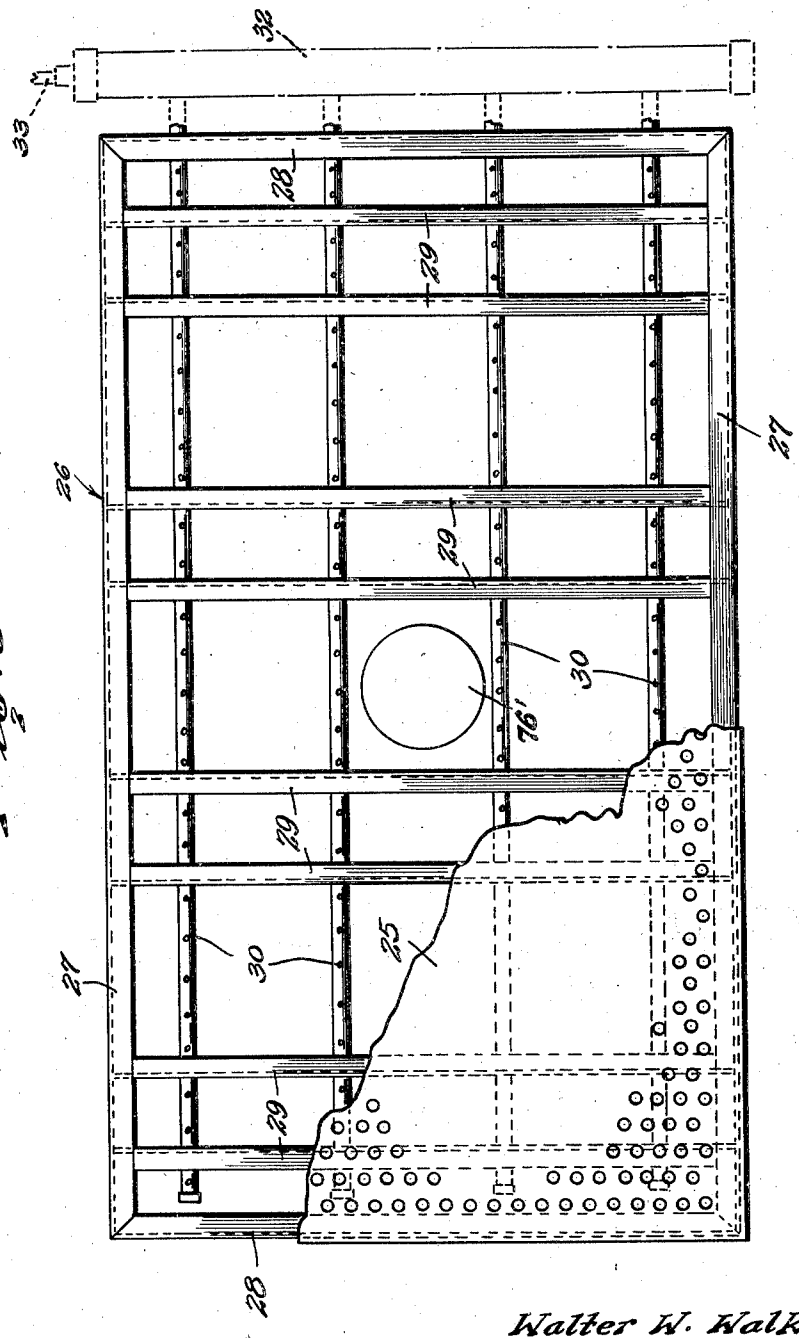


Fig. 5.

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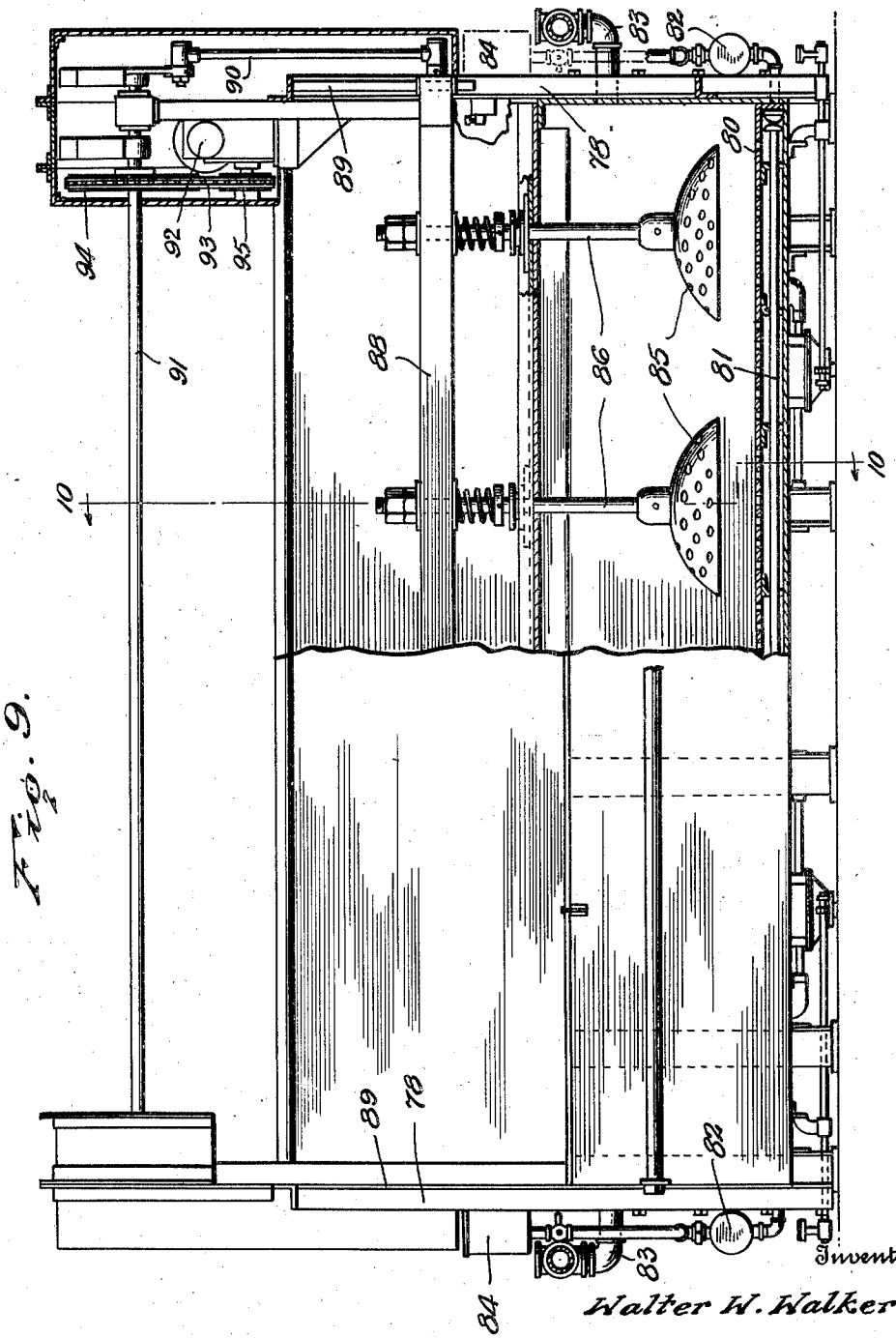


Fig. 9.

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Fig. 11.

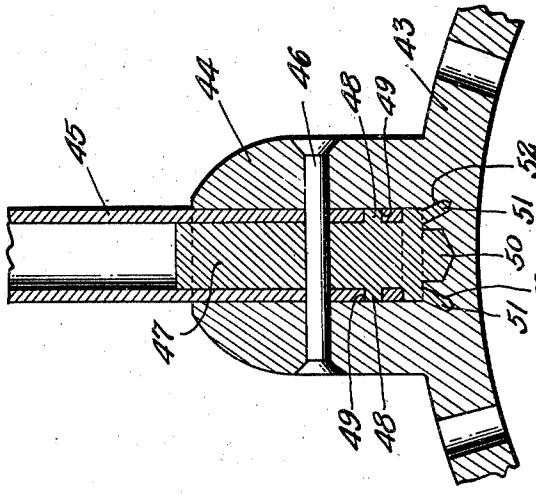
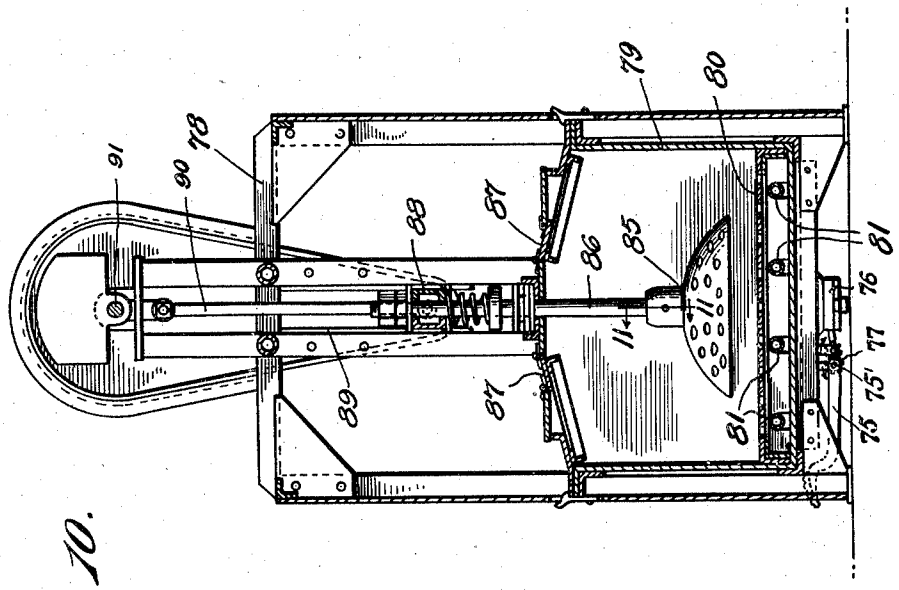


Fig. 10.



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Patented Mar. 18, 1941 2,235,094

UNITED STATES PATENT OFFICE

2,235,094

WASHING MACHINE

Walter W. Walker, Hampton, Va.

Application February 15, 1937, Serial No. 125,846

1 Claim. (Cl. 68—122)

This invention relates to a washing machine and one object of the invention is to provide a washing machine of such construction that a large quantity of clothes may be washed either in a large compartment or placed in a number of smaller compartments formed in a container where the masses of clothing will be kept separate from each other during washing thereof.

Another object of the invention is to provide improved means for very thoroughly agitating the water and causing it to be repeatedly passed through the clothing during a washing operation, the agitating means consisting of a number of agitators connected with a frame mounted for vertical reciprocating movement, the agitators being each capable of restricted movement independent of each other so that, while they may be all reciprocated vertically when the frame is in motion, they may accommodate themselves to the quantity of clothes in the compartments in which they operate.

Another object of the invention is the provision of improved means for imparting reciprocating motion to the frame carrying the agitators and causing the frame to be very easily reciprocated and prevented from becoming jammed in its guide during its reciprocating motion.

Another object of the invention is to so construct the container for the clothes that during a washing operation water may easily pass from one compartment of the container to another and dirt removed from the clothes pass through a perforated false bottom and thus accumulate in the container under the false bottom.

It is another object of the invention to provide in a washer means for admitting steam which is distributed throughout approximately the entire length and width of the container and passes upwardly through the water, thus keeping the water heated and also causing steam to pass through the clothes which are being washed.

It is another object of the invention to provide improved means for supplying bluing when necessary and also to provide improved means for draining water and accumulated dirt out of the container.

Another object of the invention is to so construct the washing machine that it will be very strongly built and capable of standing hard usage.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a view showing the improved washing machine partially in side elevation and partially in longitudinal section,

Figure 2 is a view looking at one end of the washing machine with a transmission casing thereof shown in section along the line 2—2 of Figure 1,

Figure 3 is a transverse sectional view taken vertically through the washing machine along the line 3—3 of Figure 1,

Figure 4 is a view taken along the line 4—4 of Figure 1 and looking down upon the washing machine,

Figure 5 is a view looking down upon the false bottom of the container with the metal sheet thereof partially broken away,

Figure 6 is a fragmentary perspective view of a corner portion of the washing machine,

Figure 7 is a view looking down upon Figure 6 and taken along the line 7—7 of Figure 1,

Figure 8 is a sectional view taken transversely through one end portion of the frame to which the agitators are connected,

Figure 9 is a view similar to Figure 1 of a modified form of washer,

Figure 10 is a sectional view taken along the line 10—10 of Figure 9, and

Figure 11 is an enlarged view illustrating the manner in which an agitator is connected with its shank, the view being taken along the line 11—11 of Figure 10.

This improved washing machine has a frame which may be formed of any suitable material but has been shown as metal and is provided with corner posts or standards 1 connected at their upper ends by side bars 2 and end bars 3. There have also been provided lower side bars 4 and intermediate side bars 5. The corner posts or standards each consists of a pair of angle bars 1^a and 1^b disposed, as shown clearly in Figures 6 and 7, to form a hollow corner post and meeting edges of the angle bars are welded to each other, as shown at 1^c. Bolts 6 extend through the corner posts and not only serve to assist in bracing the two angle bars forming the posts but also serve as means for securing shorter posts or vertical bars 7 against side faces of the corner posts. Additional posts 7 are provided which are spaced from each other longitudinally of the frame and from the first-mentioned posts 7, as clearly shown in Figures 1 and 4, and these posts 7 are disposed in opposed relation to each other at opposite sides of the frame and connected by cross bars 8 which have their upper faces flush with the upper faces of the horizontal flanges of the lower side bars 4, as clearly shown in Figure 6, and at their ends are riveted or otherwise firmly secured against webs or plates 9 projecting inwardly from the lower ends of the posts 7. Upper ends of the posts 7 are secured to the intermediate side bars 5. It will thus be seen that a skeleton frame has been provided which is of strong construction but comparatively light in weight. Lower bolsters or cross bars 10 connect the corner posts and above these cross bars 10 extend cross bars 11 upon which rest the lower ends of vertically extending bars 12 having

their upper ends secured against the legs 13 of supporting brackets to which bearings 14 are firmly secured.

Within the skeleton frame which has its side walls closed by upper and lower metal sheets 15 and 16, there is disposed a container 17 formed of strong sheet metal and of such dimensions that it will fit snugly in the frame and rest upon the horizontally extending flanges of the side bars 4 and cross bars 6, as shown in Figure 6 and also in Figure 3. Outstanding flanges 18 are formed along the upper edges of side walls of the container to rest upon the side bars 5 and end walls of the container are formed with inwardly extending flanges 19 which together with the flanges 18 constitute supports for closures 20 which are hinged to the top wall 21 of the container, as shown in Figure 3. Latches 22 are provided to releasably hold the closures in the lowered or closed position and operate through openings formed in the lower plate 16 of the side wall. Auxiliary closures 23 which are hinged to the main closures are provided for closing the openings 24 constituting side openings through which an attendant may obtain a view of the clothes being washed in the container after the clothes have been placed in the container and the main closures shut. These openings 24 also permit an attendant to pour soap into the container if necessary without raising the main closures and in addition permit the attendant to reach into the container if necessary. A false bottom 25 which is formed of perforated sheet metal fits into the container 17 and is formed with depending side and end flanges by means of which it is wedged or otherwise firmly secured to a frame 26 formed of angle metal and having side and end bars 27 and 28 and a plurality of cross bars 29. The false bottom will thus be spaced upwardly from the bottom of the container and steam pipes 30 may extend longitudinally in the container under the false bottom with their end portions coupled to nipples 31 extending through the end wall of the container at the front end of the washing machine and connected with a manifold 32. The manifold 32 extends across the forward end of the frame of the washing machine and at one end has connected to it a pipe 33 leading from a source of steam supply. By this arrangement steam is passed through the manifold and the distributor pipes 30 into the container and may pass upwardly through the perforated false bottom of the container to keep the water in the container hot and also pass through the clothes being washed to assist in loosening dirt during a washing operation. Water is fed into the container through an inlet pipe 34 having a coupling or elbow 35 at its outer end by means of which it is connected with a suitable source of supply. It should also be noted that there has been provided a tank or container 36 to hold bluing which is secured against a cross bar 37 at the front end of the frame and provided at its bottom with an outlet valve 38 from which extends a pipe 39 secured to a coupling 40 rising from the manifold. By this arrangement a supply of bluing may be fed from the tank 36 into the manifold when necessary and this bluing will flow through the manifold and the pipe 31 and out of the pipe to mix with water in the container during a bluing operation. Steam may be fed into the manifold to assist in driving the bluing out of the pipes. Partitions 41 and 42 which are formed of perforated sheet metal extend longitudinally and transversely in the container, as shown in Figures 1 and 3, to divide the container into a plurality of individual compartments in which clothes to be washed may be placed and thus kept separate from each other.

During a washing operation, the water which has soap or any desired washing solution mixed with it is to be thoroughly agitated and forced through the masses of clothing in the compartment. In order to agitate the water and provide means for subjecting the water and the clothing to pressure and suction to force the water through the clothing, there have been provided cups 43 which are formed of strong perforated metal and open at their lower ends so that during vertical movement of the cups in the compartment, the water may be thoroughly agitated and in addition pressure applied during downward movement of the cups and suction exerted during upward movement of the cups which will very effectively force the water through the clothing. Each of the cups has a socket 44 at its upper end into which a tubular shank 45 fits, and upon referring to Figure 11, it will be seen that a rivet or securing pin 46 is passed diametrically through the socket and the lower end portion of the shank and also through a core or plug 47 extending longitudinally in the shank and at its lower end provided with radial lugs 48 received in openings 49 formed in the shank. The plug extends below the shank and at its lower end is formed with a center boss 50 and side fingers 51 which extend in flaring relation to the longitudinal axis of the plug and are tightly seated in pockets 52. These fingers resist upward movement of the shank independent of the cup and thus remove strain which might tend to shear the securing pin 46. The plug is formed of hard metal which is poured into the shank in a melted state and fills the lower portion of the shank and also fills the side openings 49 and the lower portion of the socket and the pockets 52 and then cools to a hardened state and firmly holds the shank in engagement with the cup. Upper portions of the shank are slidably received through bearings 53 carried by the top wall of the container and above the container each shank carries a collar or disk serving as a support for the lower end of a helical spring 55 which at its upper end bears against a side bar 56 of a frame 57. Securing nuts 58 are carried by the threaded upper ends of the shank and, therefore, the shanks of the agitators will be held in engagement with the side bars of the frame 57. During upward movement of the frame, the agitators will be drawn upwardly and during downward movement of the frame the agitators will be forced downwardly. In view of the fact that the side bars engage the upper ends of the springs 55 downward movement of the agitators may terminate before downward movement of the frame has ceased, and in case there should be a greater bulk of clothes in certain of the compartments than in others stoppage of downward movement of one agitator will not interfere with downward movement of the remaining agitators and operation of the washer will not be interfered with.

In order to impart vertical movement to the frame 57, there has been provided a motor 59 mounted upon a support 60 and having its shaft provided with a sprocket wheel 61 engaged by a sprocket chain 62 trained about a larger sprocket wheel 63 carried by a shaft 64. This shaft 64 extends longitudinally of the washing

machine with its end portions mounted in the bearings 14 and each end portion of the shaft has fixed thereto counter-weights 65 and 66 disposed at opposite ends of the adjacent bearing 14, as clearly shown in Figure 1. Each of the outer counter-weights is formed with a crank arm extension 67 pivoted to the upper end of a pitman 68. At its lower end each pitman is engaged about a stub shaft 69 projecting from a block 70 carried by the adjacent end bar 56' of the reciprocating frame 57 and has a portion extending through space between the guide bars 12 and formed with side grooves 71 to receive the ribs or tongues 72 of the guide bars. This arrangement of parts provides means for raising and lowering the frame 57 from each end and causes the frame to be guided in its vertical movement and maintained in a substantially horizontal plane during such movement. A casing 73 is provided for enclosing the pitman at each end of the washing machine and the two end portions of the shaft and elements carried thereby so that these moving parts will be housed and likelihood of an attendant being injured eliminated. A control box 74 for the motor 59 is carried by the frame at one end thereof where it may be easily reached and the buttons 74' actuated to turn the motor on or off. The frame is split longitudinally of its side and end bars, as shown clearly in Figures 4 and 8, to provide companion sections 57a and 57b, thus permitting the shanks of the agitators or pounders to be easily applied and further provide a frame of hollow construction which will reduce its weight.

When this improved washing machine is in use, the covers 20 are raised and clothing which may be loose or in net bags is placed in the compartments under the cups 43. The compartments are filled with water to the desired height and soap or any other cleansing material desired placed in the compartment with the clothing. The closures 20 are then lowered to a closed position where they are secured by the latches 22 and the motor started to rotate the shaft 64 and cause the pitman bar 68 to be reciprocated vertically and thus impart vertical reciprocating motion to the frame 57 carrying the agitators. During this movement the cups move vertically in the compartment and the water and cleaning fluid will be forced through the clothing by pressure during downward movement of the cup and by suction during upward movement thereof. The auxiliary jaws or closures 23 may be raised when it is desired to inspect the contents of the various compartments but will ordinarily be left closed. Dirt which is removed from the clothing settles in the container under the false bottom. The steam which passes upwardly from the distributor pipe 30 passes upwardly through the water and through the clothing in the compartment and not only keeps the water hot but also assists in loosening the dirt from the clothing as it passes through the clothing. After the cups have been reciprocated vertically a sufficient length of time to assure thorough cleansing of clothing, the motor will be shut off and the operator steps upon a lever 75 to rotate the shaft 75'. This shaft 75' is connected with the closure 76 of an outlet 76' formed in the bottom of the container by gearing 77 between the shaft and the closure and as the shaft is turned the closure will be swung downwardly to an opened position and water and dirt may drain out of the washing machine. The closure may then be again closed, clear water fed into the container through the water inlet pipe 34 and the agitators again set in motion for the rinsing operation. The clothes may be rinsed several times and the dirty water drained out after each rinsing and during the last rinsing operation bluing may be supplied from the tank 36 to blue the clothes. After the washing operation has been fully completed, the closures 20 will be raised and the clothing removed from the compartment.

In Figures 9 and 10, there has been shown a modified construction wherein the washing machine is similar in construction to that previously described but is of less width. The skeleton frame has end portions 78 connected by longitudinally extending side bars and a container 79 corresponding to the container 17 is supported in the skeleton frame. There has also been provided a false bottom 80 mounted in the container over steam pipes 81 which have their ends connected with manifold drain tubes into which steam is fed from a source of supply and there has also been provided a water inlet pipe 83 and a blue tank 84 from which bluing is fed into the manifold when necessary. Instead of dividing the container into compartments, the perforated partitions are omitted and the agitators 85 have their shanks 86 extended upwardly through the top wall of the container between the main closures 87 and connected with a single bar 88 which takes the place of the frame 57 and has its end slidably mounted in the guide 89 and is engaged by pitman bars 90 which are reciprocated from the shaft 91 when this shaft is rotated from the motor 92 by a sprocket chain 93 trained about the sprocket wheels 94 and 95 of the shaft and motor. Details of construction which have not been specifically referred to are the same as those previously described and by comparing Figures 9 and 10 with corresponding Figures 1 and 3, it will be seen that the main differences between this embodiment of the invention and that previously described is the fact that the container is not divided into compartments and the agitators are connected with a single bar instead of a rectangular frame.

Having thus described the invention, what is claimed as new is:

In a washing machine, a container having a top wall, bearings carried by the top wall, a rectangular carrier over said container spaced upwardly therefrom and having side bars and end bars, agitators in said container having shanks extending upwardly through the top wall and through the bearings, said shanks having their upper portions slidably passing through the side bars of the carrier, adjustable fasteners carried by protruding ends of the shanks and resting upon upper faces of the side bars of the carrier, abutments carried by the shanks above the bearings, springs about the shanks confined between the abutments and the side bars of the carrier and yieldably resisting upward movement of the shanks through the carrier, and means connected with the end bars of the carrier midway the width of the carrier for imparting vertical reciprocating movement to the carrier and the agitators.

WALTER W. WALKER.