

R. S. ORR.
WASHING MACHINE.
APPLICATION FILED AUG. 7, 1911.

1,022,641.

Patented Apr. 9, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

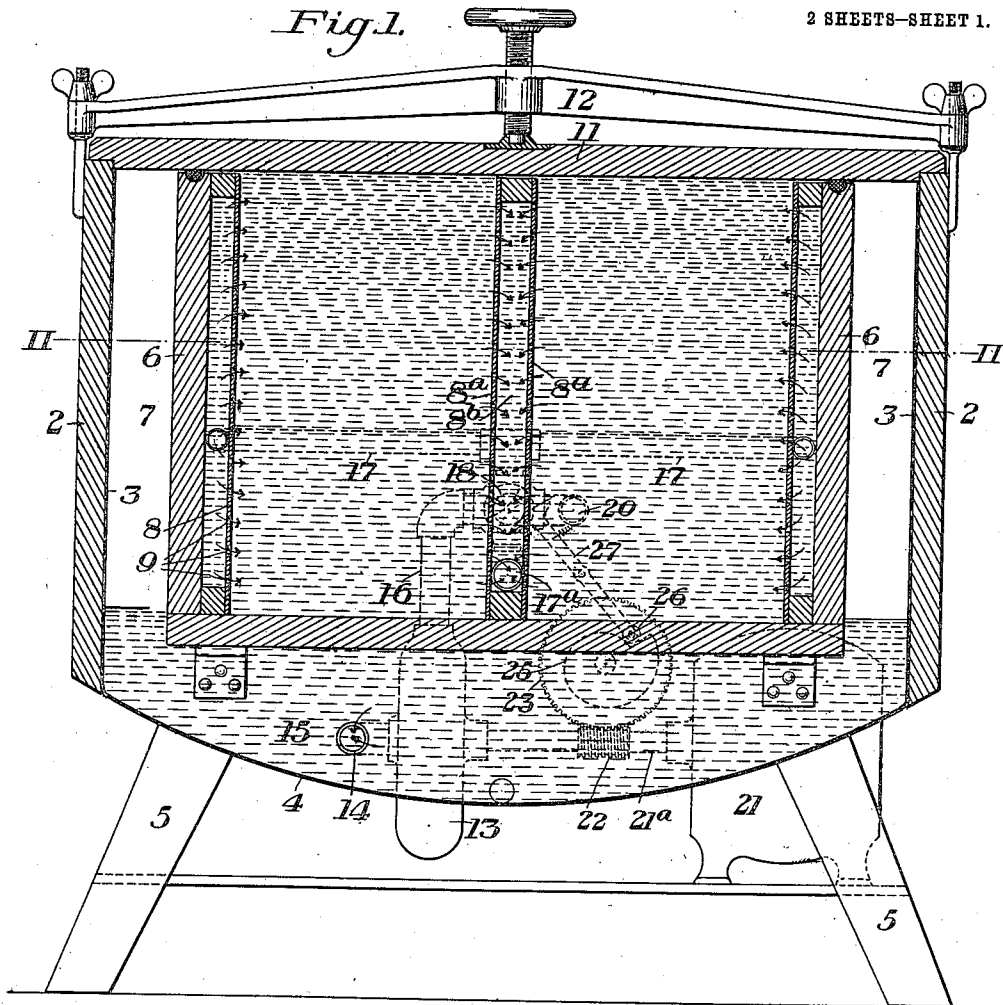
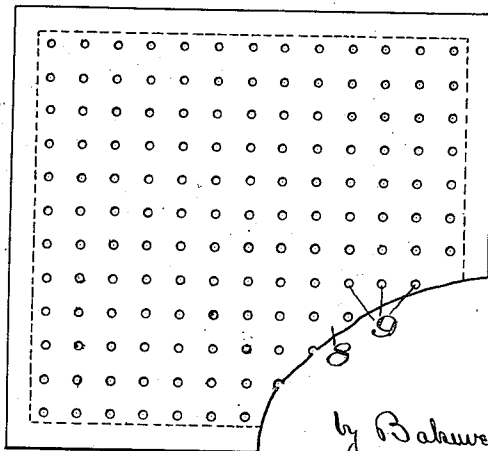


Fig. 3.



WITNESSES

R. A. Balderson
W. L. Lammie

INVENTOR

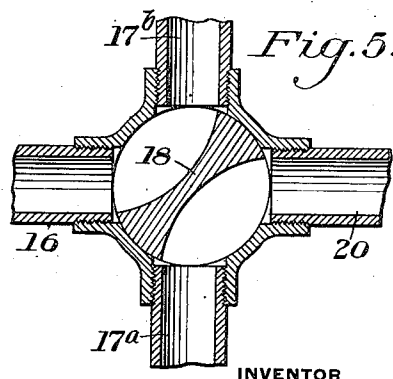
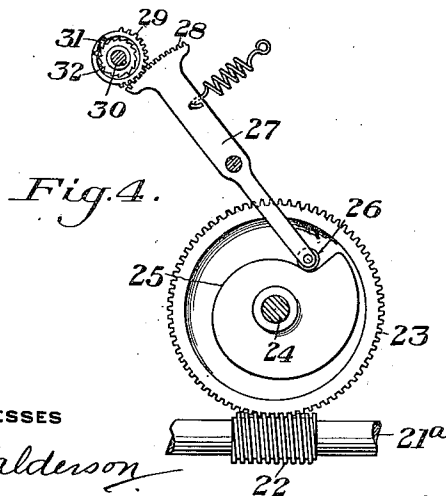
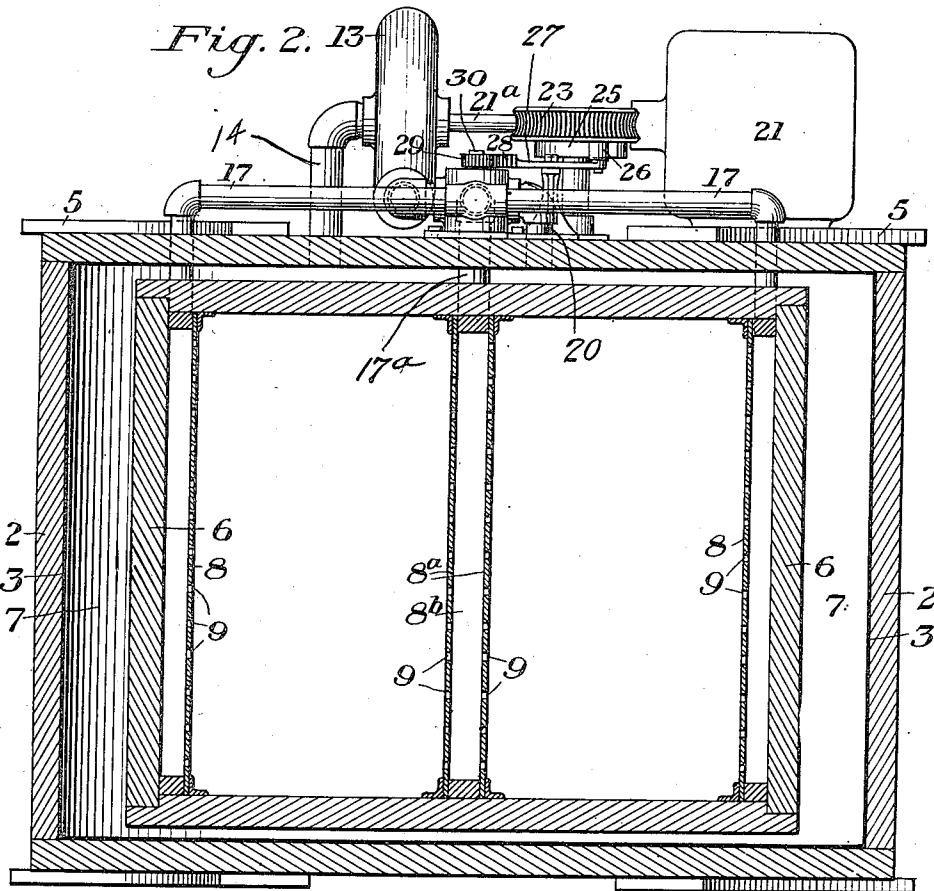
R. S. Orr,
by B. A. Lammie, R. S. Lammie,
Attys.

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2 SHEETS-SHEET 2.



WITNESSES
R. A. Balderson
W. J. Harris

INVENTOR
R. S. Orr,
by Baker, Byrnes & Parnell
Attys.

UNITED STATES PATENT OFFICE.

ROBERT S. ORR, OF PITTSBURGH, PENNSYLVANIA.

WASHING-MACHINE.

1,022,641.

Specification of Letters Patent.

Patented Apr. 9, 1912.

Application filed August 7, 1911. Serial No. 642,629.

To all whom it may concern:

Be it known that I, ROBERT S. ORR, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Washing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal vertical section of a washing machine embodying my invention. Fig. 2 is a horizontal section on the line II—II of Fig. 1. Fig. 3 is a detail view of a portion of one of the perforated bulk head plates. Fig. 4 is a detail view showing the motor reversing gearing. Fig. 5 is a sectional view of the control valve.

My invention has relation to washing machines; and is designed to provide a motor operated machine having means of novel and effective character for forcibly passing the water through the clothes to be washed. These means are preferably so arranged that substantially the entire body of water contained in the washing machine will be forced through the clothes in one direction for a desired interval of time and then the action will be reversed and the same body of water will be forced through the clothes for another interval, these operations being repeated as long as may be necessary.

The nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown the preferred embodiment thereof, it being premised, however, that various changes can be made in the details of construction and arrangement of the several parts without departing from the spirit and scope of my invention, as defined in the appended claims. In these drawings, the numeral 2 designates a tank or receptacle which is shown as having a sheet metal lining 3 and sheet metal bottom 4, and which is mounted on any suitable support, such as that indicated at 5. Placed within the tank or receptacle 2 is another receptacle 6, which is preferably sufficiently smaller in size to leave a surrounding chamber 7 and which forms the receptacle for the clothes to be washed. Near each end of the washing chamber the tank or receptacle 6 is provided with a plate or bulk head 8 extending across the full width and height of the chamber and having a plurality of relatively small perforations 9 therein. At the central portion of the tank

are two separated similar partition plates or bulk heads 8^a, forming the space or chamber 8^b between them. The tanks or receptacles 2 and 6 may be tightly closed by a removable cover 11 having a suitable securing or clamping means, such as the clamping bar shown at 12.

13 designates a centrifugal pump of any suitable character having an inlet 14 opening into the water space 15 below the bottom of the inner tank 6, and having an outlet pipe 16 leading upwardly therefrom to a short pipe section 17^b having a branch 17^a extending into each end portion of the inner tank. The ends of these branches 17 terminate within the inner tank between the perforated plates or bulk heads 8 and the adjacent end walls. Another pipe 17^a leads from the pump into the space 8^b between the partitions 8^a. The circulation of the pump is controlled by a rotary valve 18 (shown in detail in Fig. 5) and which is placed in a chamber at the junction of pipes 16, 17^a, 17^b and 20. In one position of this valve (shown in Figs. 1 and 5) the discharge from the pump passes through the valve and into both branches 17 of the pipe 17^b, and is discharged therefrom into both end portions of the tank 6. The water is thus forcibly ejected into the clothes containing compartments at each side of the partitions 8 and through the clothes therein. It then passes into the space 8^b and back through the pipe 17^a to and through the valve and into the water chamber 15 through the pipe 20. In the other position of the valve, the water is forced by the pump through the pipe 17^a, from which it is discharged into the space 8^b and thence through the partitions 8^a and through the clothes, returning through the pipes 17 and 17^b to the valve chamber and thence through pipe 20 to chamber 15.

For the purpose of driving the pump 13, I preferably provide an electric motor 21, having its armature shaft directly connected to the rotary element of the pump, as shown at 21^a in Figs. 1 and 2.

In order to automatically reverse the valve 18 various connections to be operated by the motor may be employed. A simple means for this purpose is illustrated in the drawings as consisting of a worm wheel 22 mounted on the driving shaft 21^a and engaging the worm wheel 23, mounted on a shaft 24. This shaft 24 has fixed thereto a cam 25 which contacts with a roller 26 on one arm of a pivoted lever 27. The other

arm of this lever carries a toothed segment 28, whose teeth engage with the teeth of a gear wheel 29 loosely mounted on the shaft or stem 30 of the movable valve member.

5 This gear 29 carries a pawl 31 which, in one direction of rotation of the wheel 29 has a driving engagement with the teeth of a ratchet wheel 32 fast to the shaft 30.

The operation of the device as just described will be readily seen. The gear wheel 23 and cam 25 will be slowly rotated; and at each rotation, the cam 25 will actuate the lever 27 and thereby the gear wheel 29 and the pawl and ratchet device 15 to rotate the valve sufficiently to reverse its position. The reverse movement of the lever 27 simply causes the gear wheel 29 to run idly on the shaft 30 without moving the valve. The valve is then reversed by an intermittent rotary movement in one direction. By proper arrangement of the gearing, the valve may be reversed at the desired intervals. During the periods between reversal, the water is being forced 25 continuously through the clothes; and at each reversal the flow of the water is changed in each clothes-containing compartment. This forcing of the water through the clothes in alternate directions 30 is extremely effective in loosening and removing the dirt from the clothes.

The combined area of the holes in the plates or bulk heads 8 should be equal to the combined cross-sectional area of the pipes 17; and the combined area of the holes in the plates or bulk-heads 8 should be equal to that of the holes in 8^a; and the intervals between successive reversals of the valve are preferably at least long enough to cause all the water in the washing machine to be forced through the clothes. Sufficient water should be placed in the machine to entirely fill the clothes compartments and to keep the level of water in the 45 water chamber 15 above the pump inlet 14.

It will be obvious that various changes can be made in the construction and arrangement of the parts. Thus the construction and arrangement of the inner and outer 50 tanks may be varied; any suitable form of pump and driving motor therefor can be employed; different means from those described, actuated by the pump driving motor, may be used to effect the periodical reversal of the valve, and various other changes may be made within the scope of the 55 appended claims.

Features of the machine herein shown and described, but not claimed herein, are claimed in a companion application Serial No. 641,160, filed July 18, 1911.

I claim:

1. In a washing machine, a clothes con-

taining vessel having a water discharge compartment at each end, an intermediate 65 compartment, a pump having a separate passage connecting it with each of the three compartments, a source of water supply for the pump, and valve means for reversing the circulation of the pump; whereby in 70 one position of the valve, water will flow into the clothes-containing vessel through each of the end compartments and flow out through the intermediate compartment; and in the other position of the valve, wa- 75 ter will flow into the clothes vessel from the intermediate compartment and will flow out from both end compartments substantially as described.

2. In a washing machine, a clothes con- 80 taining vessel having a water discharge compartment at each end, an intermediate compartment, a pump having a separate passage connecting it with each of the three compartments, a source of water sup- 85 ply for the pump, and valve means operated periodically by a motor for reversing the circulation of the pump; whereby in one position of the valve, water will flow into the clothes-containing vessel through 90 each of the end compartments and flow out through the intermediate compartment; and in the other position of the valve, water will flow into the clothes vessel from the intermediate compartment and will flow out 95 from both end compartments substantially as described.

3. In a washing machine, a clothes containing vessel, having a perforated plate or bulk head at each end portion thereof, and 100 also having two similar separated plates or bulk heads at its central portion, a pump, a motor for driving the pump, connections leading from the pump to opposite ends of the vessel and another connection leading 105 to the space between the central plates, a valve for controlling and reversing the circulation through said connections, whereby in one position of the valve, water will flow into the clothes-containing vessel through 110 each of the end compartments and flow out through the intermediate compartment; and in the other position of the valve, water will flow into the clothes vessel from the intermediate compartment and will flow out from 115 both end compartments and means for automatically actuating the valve; substantially as described.

In testimony whereof, I have hereunto set my hand.

ROBERT S. ORR.

Witnesses:

W. G. STERN,
J. L. GEARY.