Oct. 3, 1933. F. E. WILSEY 1,929,377

LAUNDRY MACHINE

Original Filed Jan. 2, 1930 3 Sheets-Sheet 1

Fig. 1.

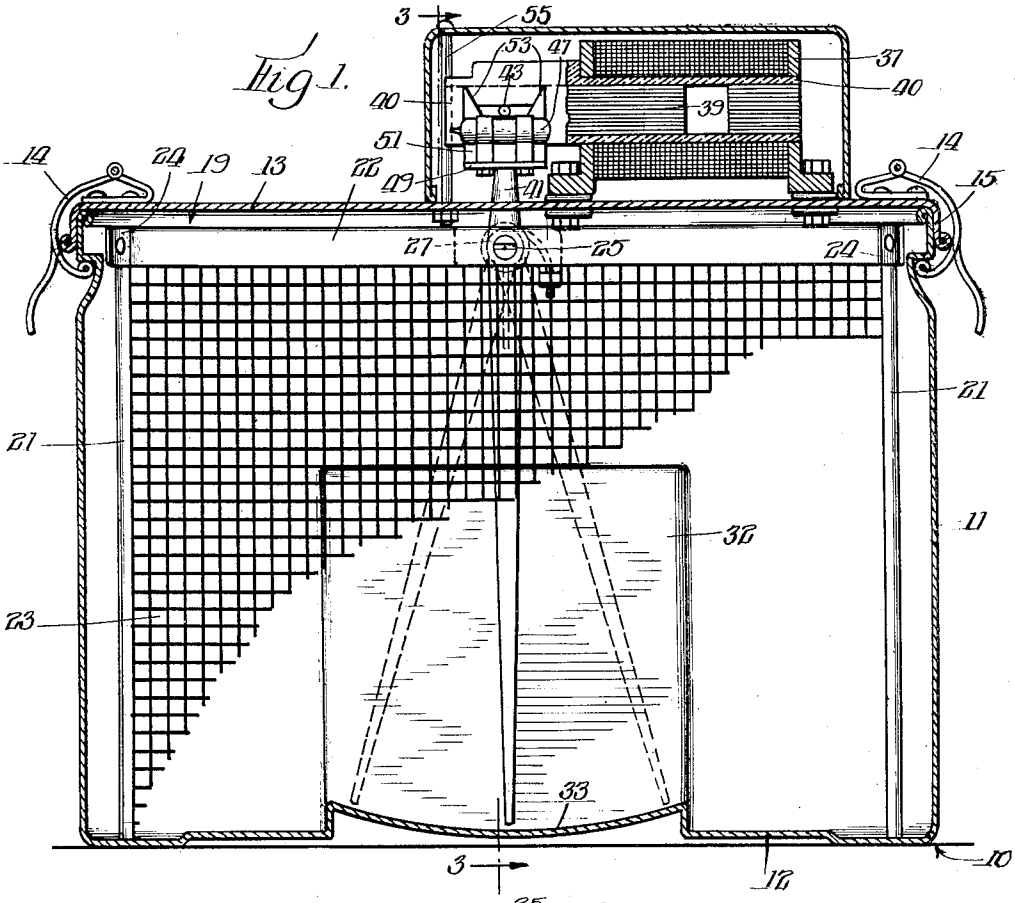
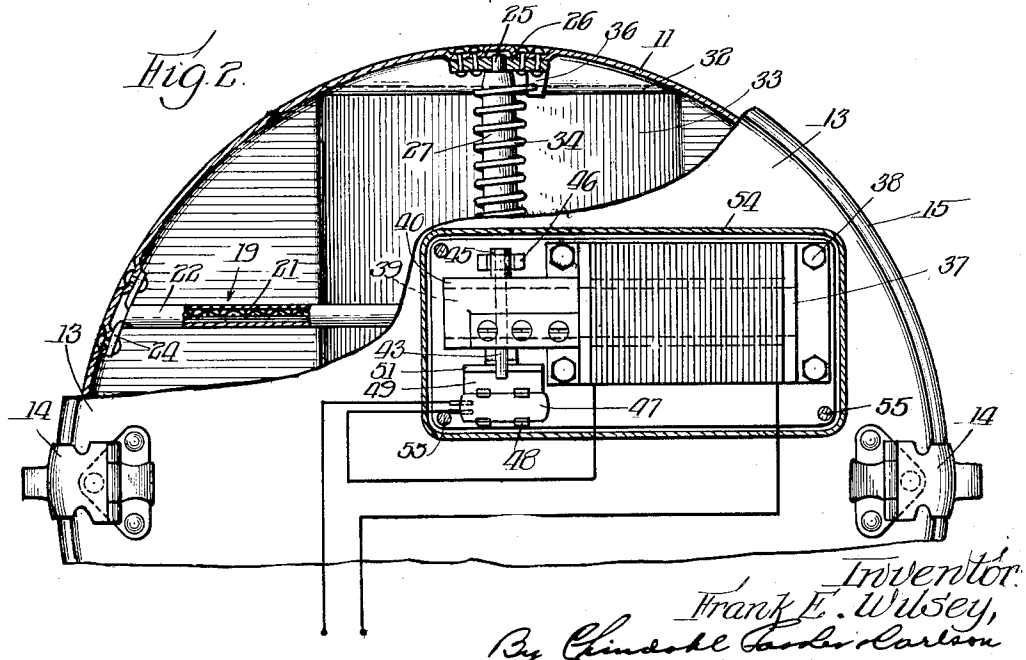



Fig. 2.




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Fig. 3.

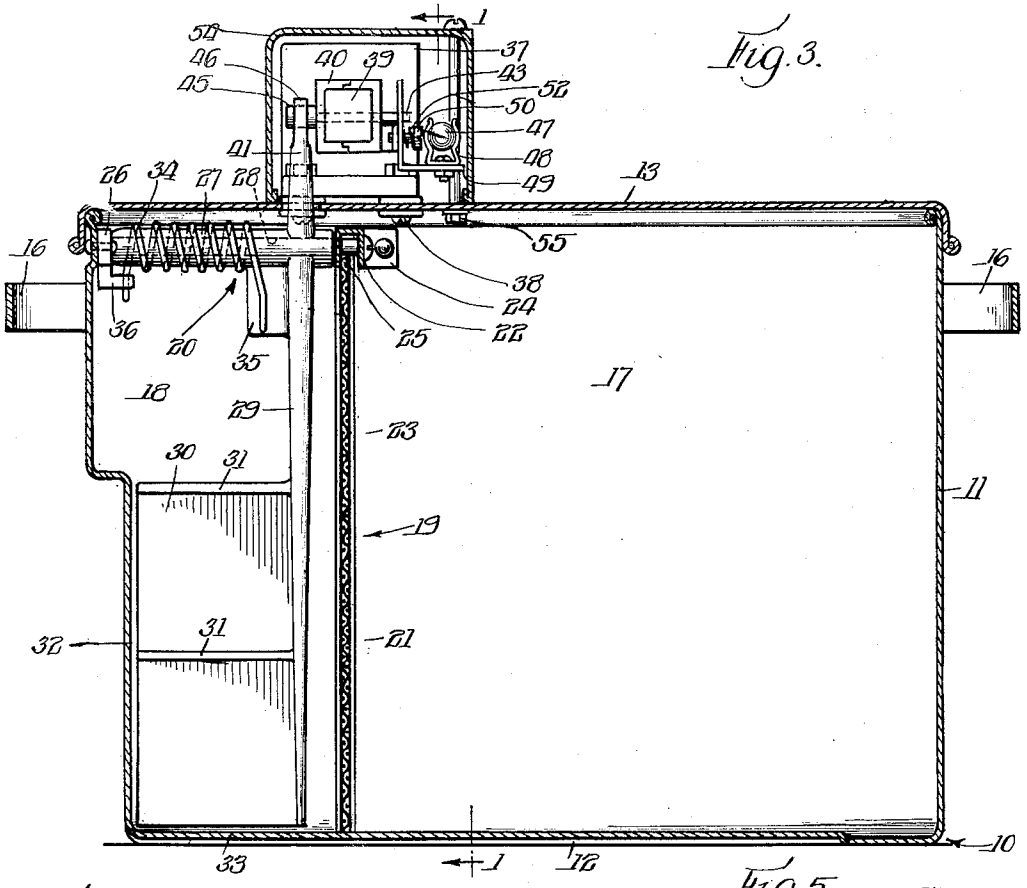



Fig. 4.

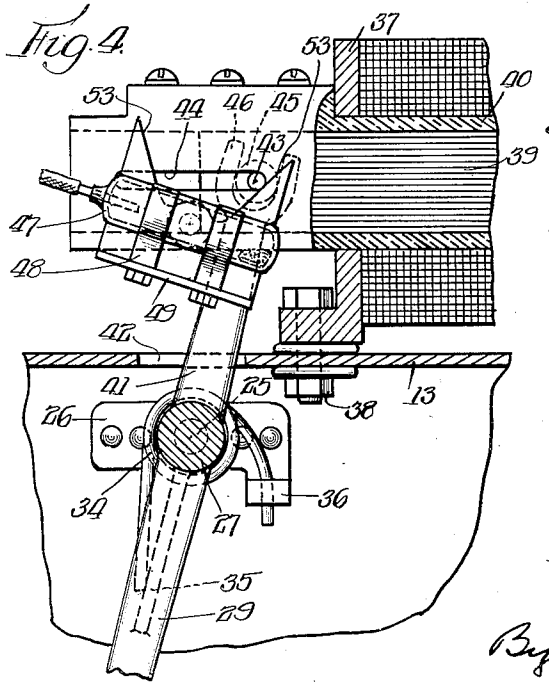
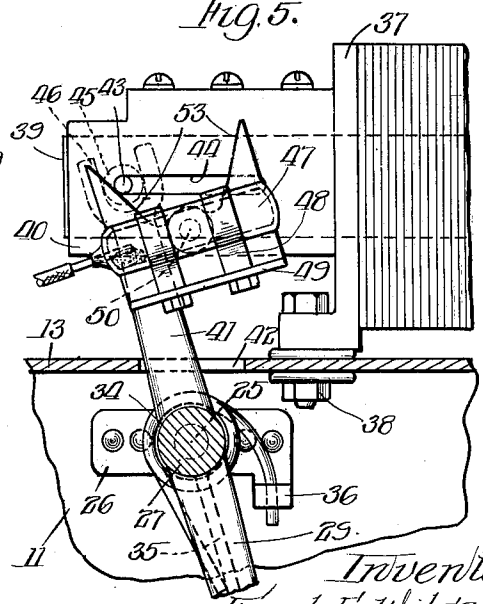



Fig. 5.




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Fig. 6.

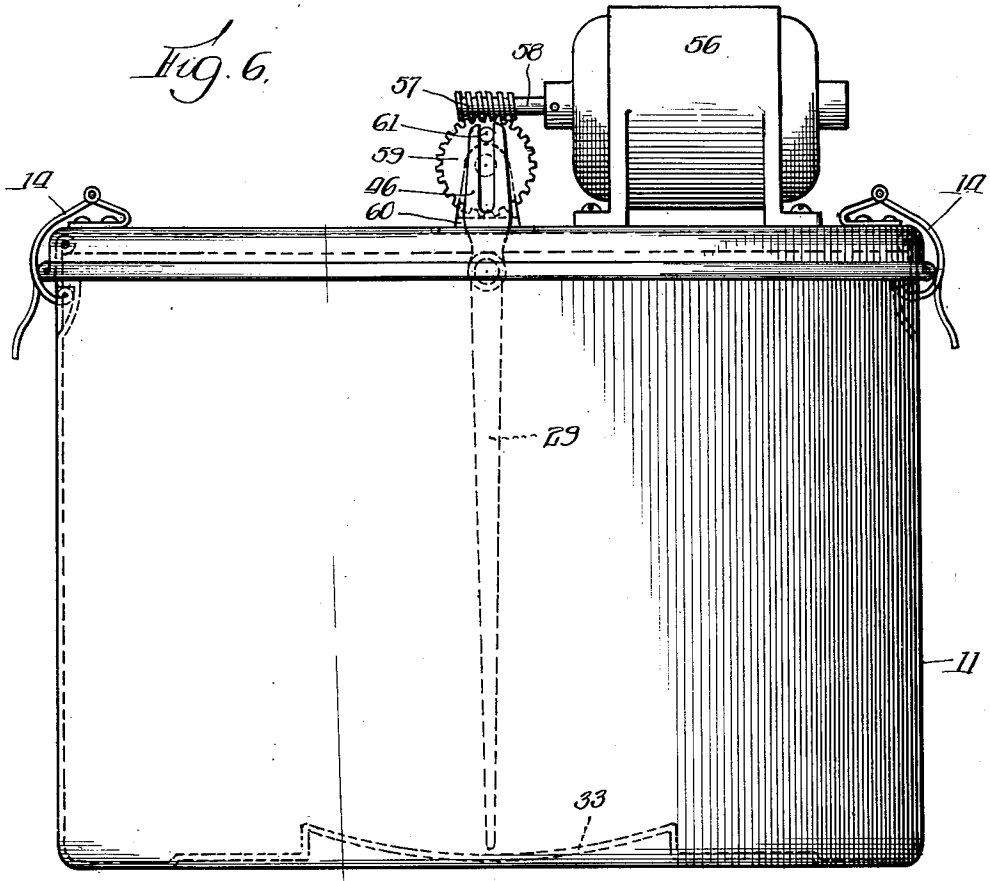
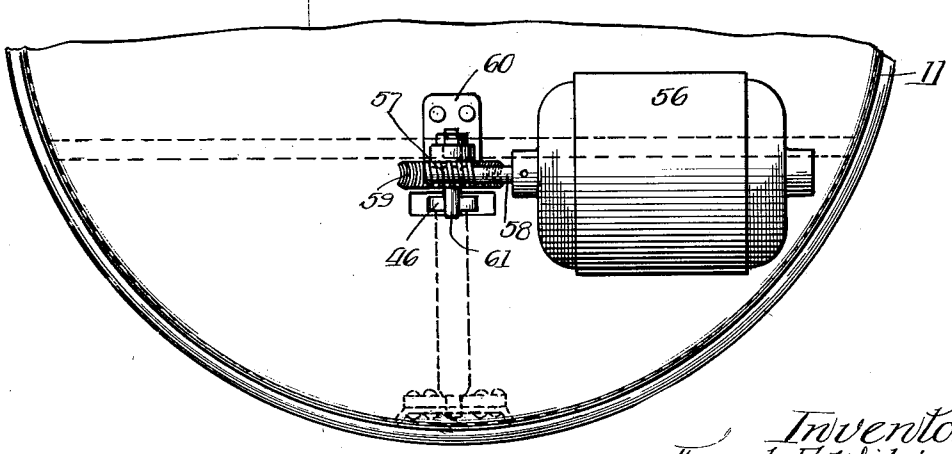



Fig. 7.




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Patented Oct. 3, 1933

1,929,377

# UNITED STATES PATENT OFFICE

1,929,377

## LAUNDRY MACHINE

Frank E. Wilsey, Chicago, Ill.

Application January 2, 1930, Serial No. 417,857
Renewed February 18, 1933

12 Claims. (Cl. 259—101)

The invention relates generally to laundry machines and more particularly to a new and improved machine adapted to be operated by electric power.

Generally the objects of the invention are to provide a machine of this character which is simple and inexpensive in construction; is of compact arrangement and light weight; can be made small in size, and washes thoroughly, gently and efficiently.

Another object of the invention is to provide a washing machine embodying new and improved means for agitating the water and the articles to be washed.

A further object is to provide a novel washing machine in which the means for agitating the water does not engage or contact the clothes.

Still another object resides in the provision of a machine of this character in which substantially all of the used wash water may be quickly and conveniently drained from the articles while they remain in the container so that a subsequent drying operation may take place without further handling of the articles.

Another object of the invention is to provide a novel machine of this nature having a body member for receiving the articles to be washed, an agitator member permanently mounted in said body member for washing said articles, a removable cover member for closing said body member, and a driving means on said cover member detachably connected to said agitator member.

Other objects and advantages will become apparent as the description proceeds.

In the accompanying drawings, Fig. 1 is a substantially central, vertical section taken on the line 1—1 of Fig. 3 and showing a washing machine embodying the features of the invention.

Fig. 2 is a fragmentary plan view of the machine, parts of the cover being broken away to show the interior of the machine.

Fig. 3 is a substantially central, vertical section similar to Fig. 1 but taken at right angles thereto on the lines 3—3 of Fig. 1.

Figs. 4 and 5 are enlarged detail views of the operating mechanism showing two of the operative positions thereof.

Fig. 6 is a fragmentary view in vertical, central section showing a modified form of driving means.

Fig. 7 is a fragmentary plan view of the modification shown in Fig. 6.

In its generic aspect the invention contemplates the provision of a container which is internally divided by a foraminous member into two compartments. One of the compartments receives the clothes or other articles to be washed and the other constitutes the chamber for the water agitator mechanism. The agitator comprises a member arranged for recurrent transverse movement in its compartment to cause a flow of water into and through the clothes compartment from opposed sides thereof. Electrical driving means including a motor mounted on the cover of the container effects the movement of the agitator.

More particularly describing the illustrated form of the present invention, 10 designates generally a container of any suitable construction. The container may be fashioned of any preferred material and is especially adapted to be furnished in small sizes. The container may have any desired shape, such as in the instant case wherein a cylindrical vertical wall 11 and a flat bottom wall 12 are integral.

A cover 13 for the open top of the container is arranged to be securely held thereon by such means as a pair of oppositely disposed latches 14 mounted on the cover. Preferably, the cover includes such means as a downwardly extending peripheral flange 15 snugly engaging the upper margin of the vertical wall of the container in order to render the container substantially watertight when the cover is in place. Handles 16 of any well known construction may be provided to facilitate handling the machine.

The interior of the container is divided into two compartments 17 and 18 (Fig. 3) of unequal size by a separating member or partition generally designated 19. The larger of the two compartments, which is the compartment 17, receives the articles to be washed, while the smaller one 18 of the compartments receives the agitator mechanism generally designated 20.

The partition 19 is in the form of a foraminous member arranged to permit of a substantially unimpeded flow of water throughout the container while preventing movement of the articles into contact with the agitator mechanism. For this purpose a preferred form of partition comprises a U-shaped frame having side members 21 and a top connecting member 22. These frame members 21 and 22 are of U-shaped cross section to present an inwardly opening channel for receiving the edges of a screen 23. Suitable brackets 24 secure the partition and screen in the container with the side members 21 of the frame extending vertically adjacent opposed portions of the side wall 11, and with the lower edge

of the screen resting upon the bottom of the container.

As may be seen clearly in Figs. 1 and 2, the partition 19 is so arranged that the top member 22 of the partition frame extends transversely across the upper portion of the container. Substantially centrally the top member 22 is transversely apertured to receive one end of a pin 25 which extends laterally across the upper portion of the smaller compartment 18 and is supported at the other end by a bearing member 26 rigid with the side wall of the container.

The agitator mechanism in this embodiment is in the form of a paddle-shaped agitator mounted upon the pin 25 for oscillating movement in the lower portion of the smaller compartment. To this end the mechanism includes a rock shaft 27 having an axial bore 28 (Fig. 3) through which the pin 25 extends. An elongated radially extending arm 29 is secured to the shaft as by being formed integrally therewith. When the shaft is assembled on the pin, the arm extends downwardly into the smaller compartment and the length of the arm is slightly less than the distance between the rock shaft 27 and the bottom 12 of the container.

The arm 29 is positioned near one end of the rock shaft so that when the shaft is mounted on the pin, the arm lies substantially adjacent the partition 19. The lower portion of the arm carries a paddle member in the arm of a flat plate 30 extending therefrom toward the container wall substantially in the plane of the rock shaft and arm. If desired, reinforcing ribs 31 extending transversely of the plate 30 may be provided. By this construction it will be evident that the paddle member 30 may swing to and fro in the bottom of the container on a transverse axis, which movement produces an alternating flow of water through opposite sides of the foraminous partition.

Inasmuch as in the present instance the container is of circular shape and since the paddle agitator describes an arc in its movements, it is contemplated that the escape or by-passing of water between the edges of the paddle and the adjacent wall and bottom of the container might prevent the full force of the agitator from being expended in creating the flow of water. Means, therefore, are provided for preventing such by-passing of the water and for directing the flow thereof in the proper direction. Thus, a portion of the circular wall 11 of the container is struck inwardly during the formation thereof to provide a flat side 32 lying substantially adjacent the free side edge of the paddle. The bottom 12 of the container is also struck inwardly to form an arcuate portion 33 (Fig. 1) corresponding to the arc described by the swinging movement of the lower edge of the paddle. Thus, the side wall and bottom of the container in every position of the paddle may be said to substantially abut the adjacent side and bottom edges of the paddle thereby preventing the water from by-passing therebetween. One of the features incident to the provision of a foraminous member between the article and agitator compartments is that after the articles have been washed the container may be tipped to one side to drain the water therefrom through said member. Consequently the operator, by pressing the articles against the member, can force a large amount of water therefrom without removing the articles from the container. This is convenient if the articles are to be subsequently rinsed since the articles can be wrung as dry as necessary while in the container.

Driving means of any suitable type, for moving the paddle through a limited oscillatory stroke, are provided and I have illustrated herein a simple and efficiently operating means for this purpose which comprises a resilient member for moving the paddle in one direction and a solenoid motor for moving the paddle in the opposite direction. The preferred type of resilient means is a helically coiled spring 34 which encircles the rock shaft 27. One end of the spring bears against a fin or flange 35 rigid with the rock shaft and the other end of the spring bears against a stationary part of the device such as a lug 36 depending from the bearing member 26 to urge the agitator in one direction, or, as seen in Fig. 3, to the right.

In providing a solenoid motor any well known construction may be employed which is capable of producing ample power to move the agitating assembly vigorously through the water against the tension of the spring 34. Such a motor is indicated at 37 and, in this embodiment, is rigidly mounted upon the outer surface of the cover, as by means of the bolts 38. Inasmuch as the constructional details of the motor do not form a part of the invention, it is deemed sufficient to say that the motor includes the usual reciprocating core 39 (Fig. 1) sliding in a bearing 40 of suitable material.

The preferred disposition of the motor on the cover is such that the outer end of the core 39 substantially overlies the inner end of the rock shaft 27. The rock shaft carries an upwardly extending arm 41 rigidly secured thereto which is arranged to project through a suitable aperture 42 (Figs. 4 and 5) in the cover to a position adjacent one side of the outer end of the core. This end of the core carries a transverse pin 43 which extends a short distance beyond both sides of the core through elongated longitudinally extending slots 44 formed in the bearing member 40. The end of the pin 43, adjacent the agitator arm 41, has an anti-friction roller 45 mounted thereon which is receivable in an upwardly opening yoke 46 comprising the upper end of the rock shaft arm 41.

The disposition of the spring 34 and the motor 37 is such that the direction of the force exerted by the spring is opposed to the force exerted when the core 39 is drawn inwardly of the motor. Consequently, energization of the solenoid is effective to move the paddle agitator in one direction and the spring to return it to its original position, the limits of movement being determined by the length of the guide slot 44 in the bearing 40.

By providing switch means for alternately establishing and breaking the energizing circuit of the solenoid at the proper moment, the transition points of the oscillatory stroke may be accurately determined. To this end (see Figs. 3, 4 and 5 particularly) a well known type of mercury switch 47 is mounted in spring clips 48 rigid with a horizontally projecting leg 49 of an L-shaped bracket. A pivot pin 50 extends through the other vertically extending leg 51 of the L-shaped bracket into engagement with the side of the bearing 40 which is opposite the arm 41 of the agitator mechanism. Suitable resilient means, such as the spring 52, is interposed between the pivot pin 50 and the leg 51 to form a somewhat yieldable shock-absorbing connection. Thus, the bracket and the switch 47 are capable of rocking

movement relative to the core of the solenoid. The pivotal axis of the bracket is positioned below and substantially centrally of the elongated guide slot 44, through which the pin 43 projects. The upper edge of the leg 51 of the bracket is provided with a substantially large central recess to receive the end of the pin 43, and the lateral edges of the recess are formed to constitute inclined cam surfaces 53 positioned adjacent opposite ends of the guide slot 44. Consequently, as the pin 43 reciprocates in the slot 44, the cam surfaces 53 will be alternately engaged thereby to rock the bracket and the mercury switch 47. Therefore, by mounting the mercury switch in the clips 48 in such manner that the switch disconnects when the bracket is rocked by the core moving inwardly of the solenoid (as shown in Fig. 5), it will be evident that the solenoid will be disconnected substantially at the end of the inward stroke of the core to permit the spring 34 to function. Conversely as the spring returns the agitator mechanism to its original position, the pin 43 engages the opposite cam surface 53 to rock the mercury switch into the circuit establishing position shown in Fig. 4.

Preferably an enclosing housing 54, for the solenoid motor and the mechanism associated therewith, is provided which may be detachably secured to the cover by any suitable means such as the bolts 55.

Referring to Figs. 6 and 7, a modified form of driving means is illustrated. In this form the solenoid motor has been replaced by an ordinary rotary type of electric motor 56 mounted on the cover. The container and the agitating mechanism associated therewith remain substantially the same with the exception that the spring 34 for moving the shaft in one direction is omitted and the yoke 46 on the arm 41 is somewhat longer. In order to drivingly connect the motor 56 with the yoke 46 of the agitator mechanism, a worm 57, rigid with the armature shaft 58 of the motor, is arranged to engage a worm wheel 59 rotatably supported upon a bracket 60 on the cover. The worm wheel 59 carries an eccentrically located pin 61 projecting laterally therefrom for engagement with the yoke 46. Thus rotation of the motor effects the desired reciprocation of the agitator mechanism.

It will be apparent from the foregoing that a simple construction has been created for rapidly oscillating an agitator in a container to create a cleansing flow of water through articles to be washed. The full force and effect of the agitator mechanism is efficiently directed to the large compartment through the screen and thence through the clothes by the peculiar formation of the side wall and bottom of the container adjacent the agitating paddle and the mechanism for oscillating the agitator is quiet, powerful and positive in action.

Particularly with reference to the foraminous member, the agitating mechanism, the driving mechanism, and the means for directing the flow of water, it is contemplated that changes and modifications may be made in the illustrated construction by those skilled in the art. It is, therefore, not intended to limit the present invention precisely to the disclosed device but to cover all alternative forms falling within the spirit and scope of the appended claims.

I claim as my invention:

1. A laundry machine comprising, in combination, a container, a vertically disposed foraminous partition dividing said container into two compartments, a swinging agitator pivoted on a horizontal axis in one of said compartments, a cover for said container, and driving means on said cover detachably connected to said agitator.

2. A laundry machine comprising, in combination, a container, a foraminous partition member within said container providing a plurality of internal compartments, a paddle-shaped agitator pivoted in one of said compartments on a horizontal axis for swinging movement in the lower portion of the container, and means for directing the flow of water into the other of said compartments.

3. A laundry machine comprising, in combination, a container, a foraminous partition member within said container providing a plurality of internal compartments, a paddle-shaped agitator pivoted in one of said compartments on a horizontal axis for swinging movement in the lower portion of the container, and means for preventing the by-passing of water between the edges of the agitator and the bottom and an adjacent side of the container so that the flow of water will be directed into the other compartment.

4. A laundry machine comprising, in combination, a container having a substantially cylindrically shaped vertically disposed side wall and a bottom wall, and an agitator comprising a flat member journalled in said container for swinging movement on a horizontal axis adjacent the wall of the container, said side wall having the portion thereof next adjacent said agitator formed to provide an abutting flat surface adapted to prevent the by-passing of water between said surface and the flat member so that the flow of water will be primarily directed toward the adjacent cylindrical portions of said wall for circulation throughout the container.

5. A laundry machine comprising, in combination, a container, a vertically disposed foraminous partition secured therein dividing said container into a relatively large article receiving compartment and a smaller agitating compartment, and horizontally reciprocating means in said smaller compartment disposed for movement through a path parallel and adjacent to said partition for violently agitating the water and effecting a lateral flow thereof in alternate directions into the larger compartment.

6. A laundry machine comprising, in combination, a container, a foraminous member dividing said container into large and small compartments, and means in said small compartment movable parallel to said member for creating a flow of water laterally and alternately first into one and then the other side of said large compartment.

7. A laundry machine comprising, in combination, a container, a foraminous member secured therein dividing said container into compartments, an agitating mechanism mounted in one of said compartments for swinging movement on a horizontal axis, spring means for moving said agitator in one direction, and power driven means for moving said agitator in the opposite direction.

8. A laundry machine comprising, in combination, a container, a cover member therefor, a foraminous partition within said container forming separate compartments, agitating means mounted in one of said compartments for oscillating movement on a horizontal axis, a solenoid motor mounted on the cover, means connecting said motor with said agitator for moving the agita-

tor in one direction, means for moving the agitator in the opposite direction, and means controlled by the movement of said agitator for energizing said motor at spaced intervals.

9. In a laundry machine, the combination of a container, a foraminous member dividing said container into compartments, agitating means in one of said compartments, a solenoid connected to said agitator for moving said agitator in one direction, and means for moving said agitator in the other direction.

10. A laundry machine comprising, in combination, a container, a foraminous partition dividing said container into compartments, an agitator mounted in one of said compartments for swinging movement in a horizontal axis, resilient means yieldably resisting the movement of said agitator in one direction, a cover for said container, a solenoid motor connected to said agitator for moving said agitator against the force of said resilient means, an energizing circuit for said motor, and switch means controlled by the movements of said motor to break the motor circuit at the end of the motor effected stroke of the agitator and to establish said circuit at the end of the resiliently effected return stroke of the agitator.

11. A laundry machine comprising, in combination, a container, a foraminous partition dividing said container into compartments, an agitator mechanism journalled on a horizontal axis in the upper portion of one of said compartments, said mechanism comprising a bearing member, an arm extending downwardly therefrom having a flat surface at the lower end thereof, and an arm extending upwardly therefrom beyond the top of said container, a cover for said container having an aperture therein through which said upwardly extending arm projects, a solenoid on said cover including a reciprocating core element, and means detachably connecting said core element and said upwardly extending arm, and resilient means resisting the movement of said core in one direction.

12. A laundry machine comprising, in combination, a container, a cover therefor, a vertical screen extending across the interior of said container to divide the container into a small compartment and a larger article receiving compartment, a rock shaft journalled to extend transversely across the upper part of the small compartment, a paddle agitator depending from said shaft into said compartment, resilient means interposed between said agitator and a stationary part for exerting a force moving said agitator in one direction, and a solenoid motor on said cover connected with said agitator for moving said agitator in the opposite direction.

FRANK E. WILSEY.

## CERTIFICATE OF CORRECTION.

Patent No. 1,929,377, October 3, 1933,

FRANK E. WILSEY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 31, for "arm" read form; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of November, A. D. 1933.

F. M. Hopkins

(Seal) Acting Commissioner of Patents.