

Oct. 5, 1926.

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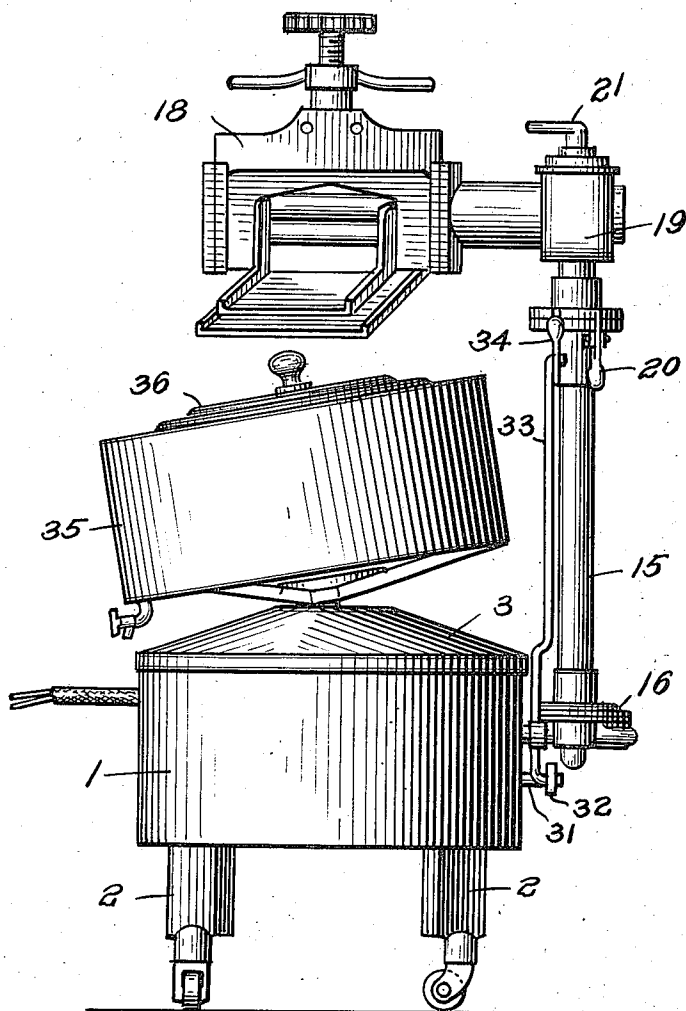
F. W. WAPPAT

WASHING MACHINE

Filed July 16, 1925

4 Sheets-Sheet 1

FIG. 1.



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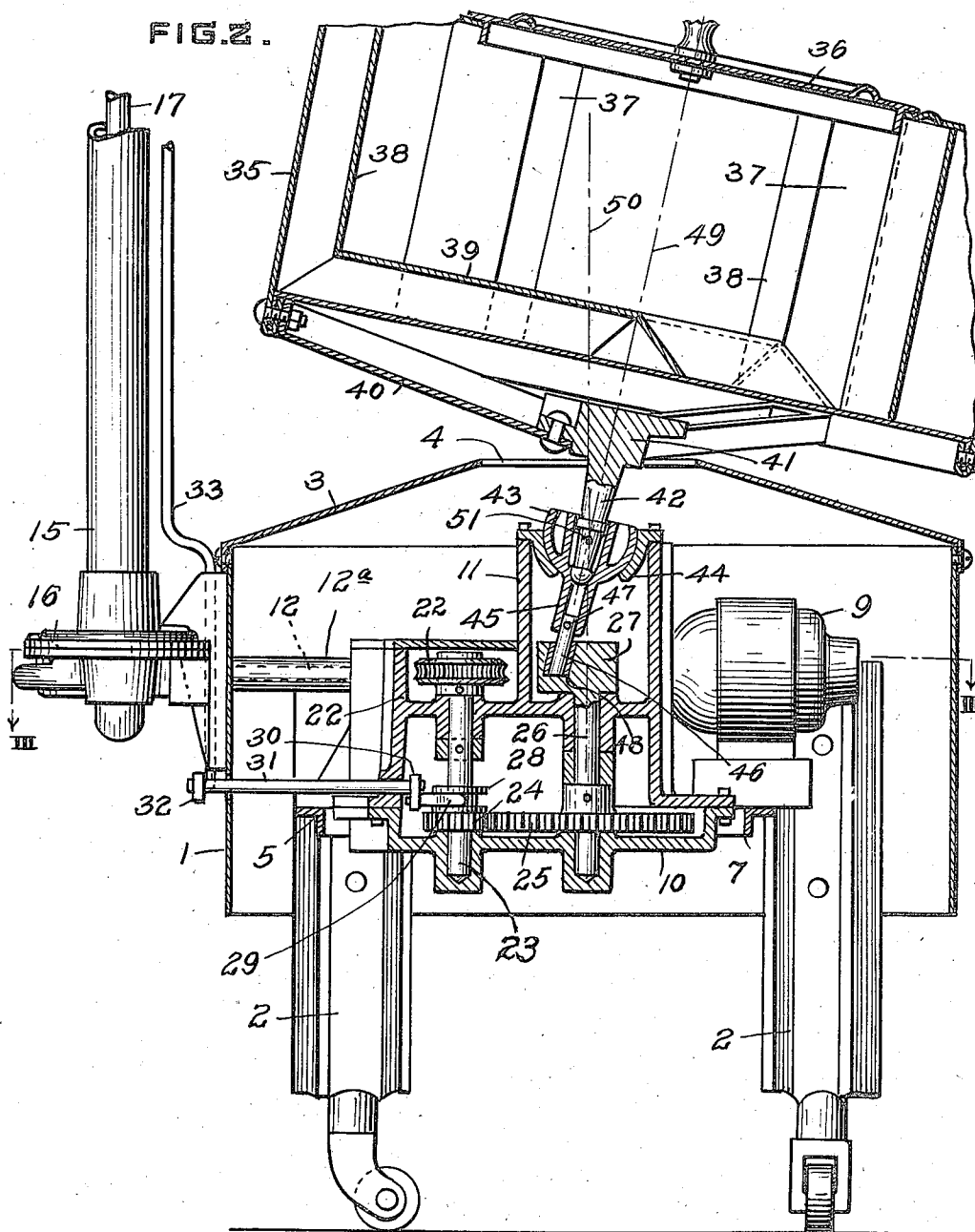
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FIG. 2.



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FIG. 3.

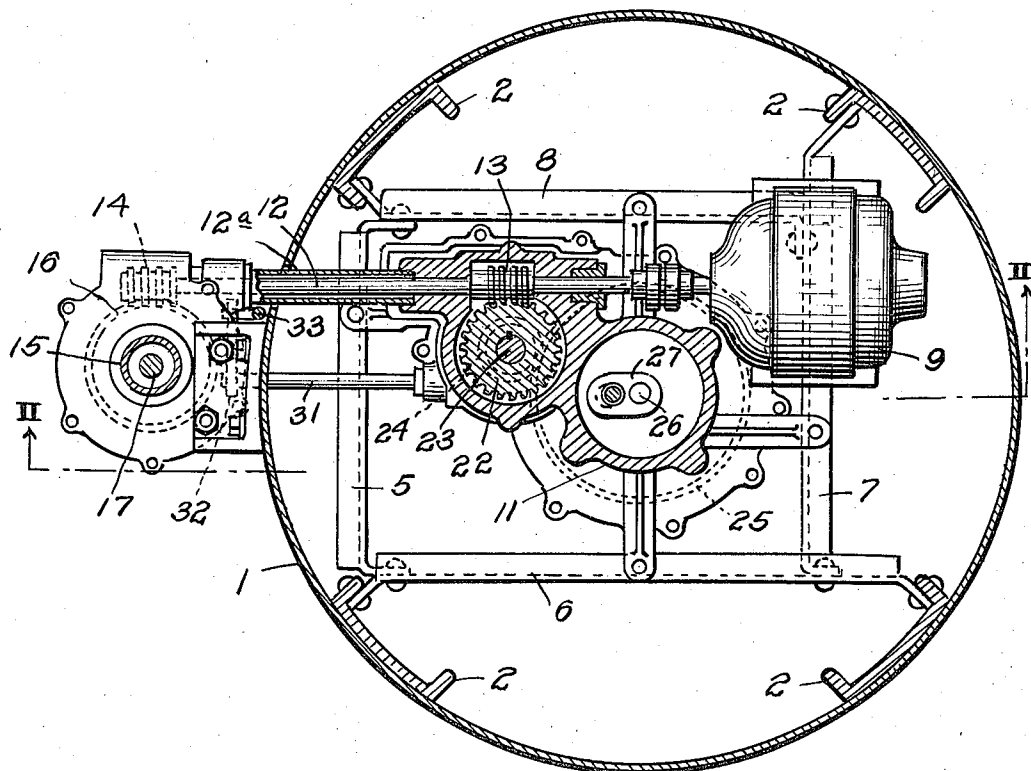
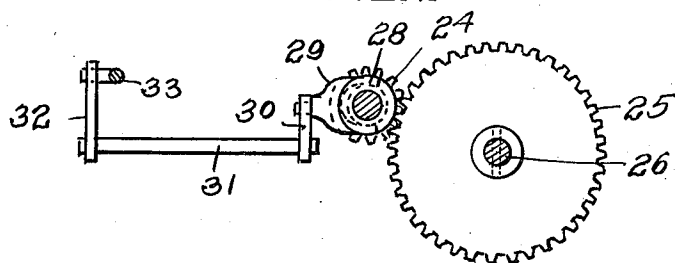


FIG. 4.



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FIG. 5.

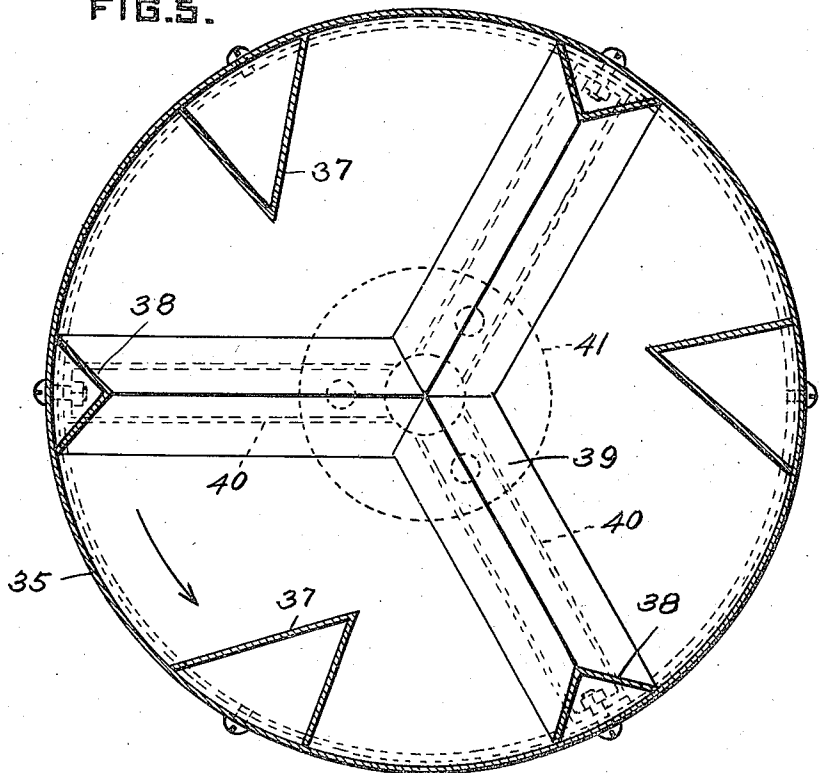


FIG. 6.

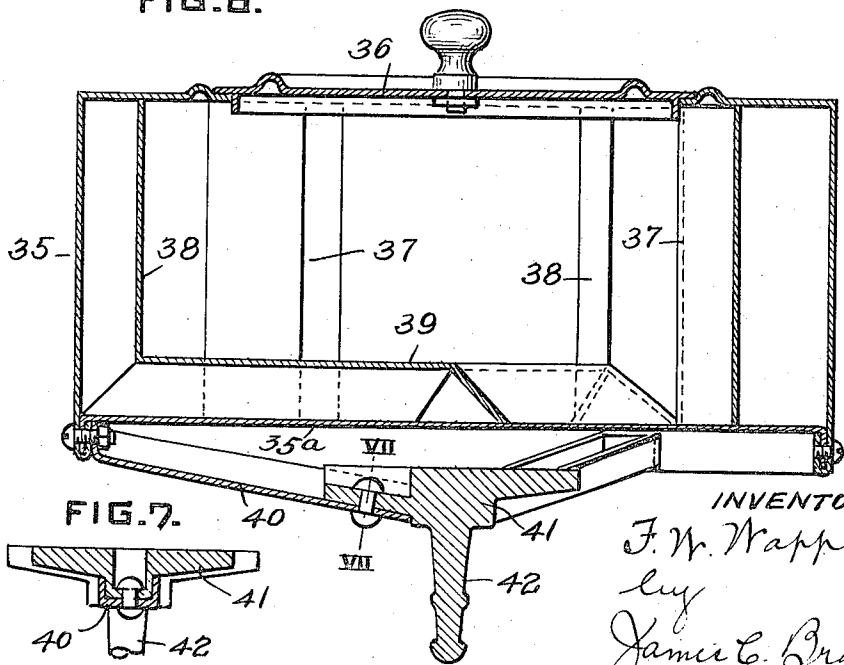
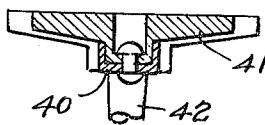


FIG. 7.



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UNITED STATES PATENT OFFICE.

FRED W. WAPPAT, OF PITTSBURGH, PENNSYLVANIA.

WASHING MACHINE.

Application filed July 16, 1925. Serial No. 43,947.

The invention relates to washing machines, and particularly to the type in which the clothes container or tub is caused to oscillate on an inclined axis around the vertical axis of the machine. It has for its principal objects, the provision of a machine of this type having improved and simplified means for supporting the weight of the container and securing its oscillation; the provision of an improved baffle arrangement for the tub peculiarly adapted for an efficient agitating and scrubbing effect when used in a tub having the form of movement above referred to; the provision of an improved form of bottom construction for the tub adapting it to successfully sustain the strain imposed upon it and incident to supporting the tub from beneath, and giving it its movements by means located below the tub; and the provision of a construction wherein the parts exposed to the greatest strain and wear may be readily removed and replaced and at a relatively low cost. One embodiment of the invention is illustrated in the accompanying drawings wherein:

Figure 1 is a front elevation of the general arrangement, including the wringer, which is shown on a relatively somewhat larger scale than the tub. Fig. 2 is a vertical section on the line II—II of Fig. 3. Fig. 3 is a transverse section on the line III—III of Fig. 2. Fig. 4 is a detail plan view of the washer drive coupling device. Figs. 5 and 6 are sections through the tub, Fig. 5 being a horizontal section and Fig. 6 a vertical section. And Fig. 7 is a detail section on the line VII—VII of Fig. 6.

The supporting frame or base of the machine consists of the tubular body 1, provided with the legs 2 riveted thereto, and the conical top 3, secured thereto by screws or bolts and having the opening 4 at its center. The body is stiffened by the transverse angles 5, 6, 7 and 8, riveted to the legs 2 and to each other as indicated in Fig. 3, and acting as a support for the motor, and driving mechanism which operates the washer and its wringer.

Bolted securely to the transverse angles, is the motor 9 and the gear casing consisting of the castings 10 and 11. The motor is provided with a horizontal drive shaft 12 mounted in suitable bearings and provided with the worm 13 (Fig. 3) for driving the tub moving mechanism, and with the worm 14 for operating the wringer driving mechanism,

which latter is mounted in the casing 15 bolted or riveted to the frame member 1 (Figs. 2 and 3). The worm 14 engages the worm wheel 16 carried by the vertical shaft 17, and such shaft in turn drives the rolls of the wringer 18 through suitable gearing and connections in the casings 15 and 19, which form no part of the present invention. The casing 19 is swiveled so that it may be swung laterally to carry the wringer from over the tub and is clamped in position by the locking cam member 20. A suitable clutch is also provided in the casing 19 for connecting and disconnecting the wringer drive, this being operated by the handle 21. A tube 12^a surrounds the shaft 12, and any lubricant which collects at the bottom of the casing 15, drains through this tube and along the shaft 12 into the gear casing 10, 11 where it is reused and from which it can be drained from time to time.

The worm 13 on the shaft 12 engages and drives the worm wheel 22 carried by the countershaft 23, provided at its lower end with the pinion 24. This pinion meshes with a spur gear 25 carried by the vertical crank shaft 26. This shaft has at its upper end the crank 27, which serves to give the tub its agitating movements, as later described. The drive between the shaft 23 and the crank shaft 26 is connected and disconnected by shifting the pinion 24 vertically, such pinion being splined on the shaft 23 and having a grooved hub 28. This hub is engaged by the yoke 29 carried by the crank arm 30 (Figs. 2 and 4), which is in turn carried by the shaft 31. The shaft 31 is rotated by the crank arm 32, to the outer end of which is attached the vertically movable operating rod 33. This rod may be moved up and down by the handle 34 (Fig. 1) carried by the upper end of the casing 15, thus shifting the pinion 24. As shown in Fig. 2, such pinion is in driving engagement with the gear 25, but when moved upward, it lies above such gear and out of engagement therewith. Suitable yielding means of any type may be employed for holding the pinion in either of its two positions, so that it will maintain itself in either position until shifted.

The tub and container 35 is constructed of sheet copper, or other suitable sheet metal, and is provided with a cover 36. It is provided upon its interior with the spaced up-

right baffles 37 and 38, secured to the side walls of the tub, and with the horizontal baffles 39 secured to its bottom; and arranged radially as indicated in Fig. 5. These baffles are all preferably V shape in cross section. The side walls of the tub are continued down below the bottom wall; thus providing a flange which serves as a means of attachment for a spider made up of a plurality of radial channels 40 bolted at their outer ends to the flange. This flange with that of the bottom member 35^a constructed as indicated in Fig. 6 adds greatly to the strength and stiffness of the tub and a firm anchorage for the spider. These arms are riveted at their inner ends to a steel casting 41 (as indicated in Figs. 6 and 7), which has integral therewith a downwardly projecting shaft 42.

The tub is supported from beneath by a universal joint support in the form of a convex or ball member 43 and a concave member or socket 44, which latter is bolted to the casing 11. These parts might be reversed although the arrangement shown is preferred. The member 43 is itself provided with a socket, in which fits the lower end of the shaft 42, and with a stem 45 carrying the bearing member or pin 46, such pin preferably having a driven fit in the stem and being secured by a pin 47. The pin 46 is journaled in an inclined socket in the crank, 27 (Fig. 2), such socket being preferably provided with a renewable wearing sleeve or bushing 48.

The axis of the tub, the shaft 42 and the pin 46 are all in alignment and lie on the line 49, which intercepts the axis of rotation 50 of the crank 27 at the point 51, the line 49 lying at an acute angle with respect to the line 50, so that as the crank 27 rotates, the center line 49 of the tub is caused to describe the surface of a cone around the vertical line 50, as an axis of generation. At the same time, the tub is free to rotate, as an idler about its axis 49, since the pin 46 is free to rotate with respect to the bushing 47 in which it is journaled. The shaft 42 fits its tapered socket in the member 43 tightly, so that there is no rotative movement between the shaft and such socket, but the connection at this point permits the tub to be lifted off without difficulty when it becomes necessary to do so in order to give access to the parts beneath.

When the tub is rotated in a counter clockwise direction (Fig. 5), the water and clothes therein, circulate in the same direction, the baffles giving a rubbing or wash board effect on the clothes, and also interrupting the flow of the water and throwing it inward from the vertical baffles and upward from the bottom ones. This agitation of the water promotes the cleansing effect, the longer baffles 37 particularly coming into

play when the tub is operating below capacity with only a partial load of clothes. The flange construction at the bottom of the tub in connection with the spider support gives the tub the necessary strength and rigidity at the point where the strain is greatest, and where weakness would ordinarily develop after long continued service in a construction of this type. Other advantages incident to the cheapness and simplicity of the construction will be readily apparent to those skilled in the art.

What I claim is:

1. In combination in a washing machine, a frame, a tub thereabove, a ball and socket joint carried by the frame, taking the weight of the tub, and comprising a convex joint member and a concave joint member, one of which is secured to the frame and the other of which is secured to the tub, a crank supported in the frame beneath the joint and having a vertical driven shaft in line therewith, and a bearing member projecting downwardly from the said joint member which is secured to the tub and having journaled engagement with the crank, so that the tub is free to rotate as an idler about its axis independent of the rotation of the crank, the axis of said bearing member and tub lying at an angle to the vertical.

2. In combination in a washing machine, a frame, a tub carried thereby, a free universal mounting for said tub having its axis of rotation inclined at an acute angle to the vertical, a stem in alignment with said axis of rotation, means freely engaging said stem for swinging the tub upon its universal mounting so that its axis describes a cone with the tub free to rotate as an idler about its own inclined axis, and upright baffles secured to the side walls of the tub and projecting inward therefrom.

3. In combination in a washing machine, a frame, a tub carried thereby in a universal mounting and with its axis inclined at an acute angle to the vertical, means for swinging the tub upon its universal mounting so that its axis describes a cone with the tub free to rotate as an idler about its own inclined axis, and upright baffles secured to the side walls of the tub and projecting inward therefrom, a part of such baffles projecting inward a greater distance than the others.

4. In combination in a washing machine, a frame, a crank having as its axis of rotation a vertical driven shaft carried by the frame, a sheet metal tub having its side wall and bottom wall flanged downwardly below the bottom wall to provide an annular stiffening ring, a spider comprising a plurality of radial arms rigidly secured at their outer ends to said ring, a block at the center of the spider secured to the inner ends of said arms and provided with a downwardly pro-

jecting shaft positioned axially of the tub and journaled in said crank, and bearing means for supporting the tub with its axis of rotation at an acute angle to the axis of rotation of the crank, so that the rotation of the crank causes the tub to be oscillated about the axis of rotation of the said crank, the tub being free at the same time to rotate as an idler about its own axis independent of the rotation of said crank. 10

In testimony whereof, I have hereunto subscribed my name this 14th day of July, 1925.

F. W. WAPPAT.