

Dec. 24, 1929.

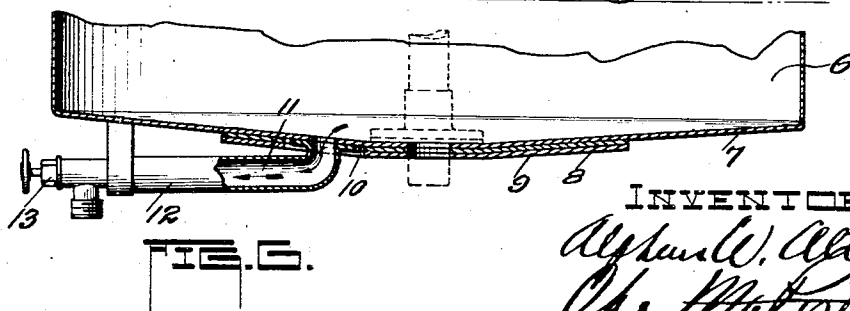
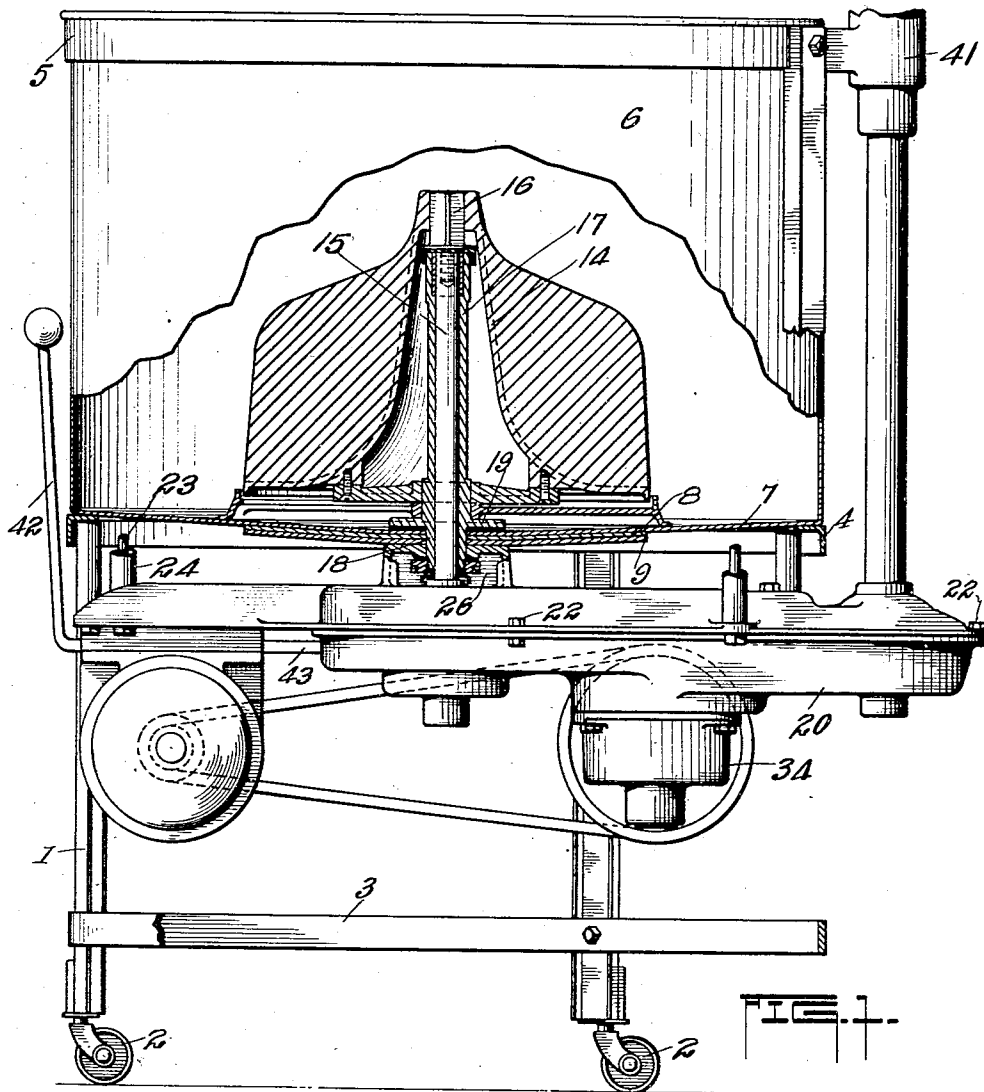
A. W. ALTORFER

1,740,938

WASHING MACHINE

Filed July 2, 1925

2 Sheets-Sheet 1



INVENTOR.  
*Alfred W. Altorfer*  
*Chas. H. Hutton*  
ATTY

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Alfred W. Atterfer  
Chas. M. Porter

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ATTY

## UNITED STATES PATENT OFFICE

ALPHEUS W. ALTORFER, OF PEORIA, ILLINOIS

WASHING MACHINE

REISSUED

Application filed July 2, 1925. Serial No. 41,150.

This invention has reference to improvements in washing machines, and particularly to that class of machines employing a washing element or elements operative from and by a shaft passing up through the bottom of the tub and actuated from mechanism below the tub or container.

The principal object of the invention, is the supporting of the gear housing or casing below the tub, by suspending the same from the frame in which the tub is located, and to a new and novel means for journaling the shaft, which passes up through the tub bottom, and to the means for clamping or securing the tub in the frame and to the gear casing or housing.

A further object of the invention is in the provision of improved securing means for clamping the tubular post, in which the shaft has a journal bearing, to the gear casing or housing, and to a water shed on said shaft, at the gear casing or housing, for diverting casual water trickling down the shaft from getting into the gear casing or housing.

The invention has for a further object to introduce into the driving gearing, a crown gear which eliminates end thrust and which also removes the necessity for fine adjustments.

A still further object of the invention is in the improved tub or container bottom and the drain therefor.

That the invention may be more fully understood, reference is had to the accompanying drawings forming a part of this description, illustrating a preferred embodiment of the invention, in which:—

Fig. 1 is a side elevation partially in section showing a washing machine embodying my invention;

Fig. 2 is a detail in section of the gear casing or housing and showing the arrangement of gearing therein and the manner and means of clamping the tubular post or casing to the gear casing or housing;

Fig. 3 is a plan view, as the same would appear, if taken on the line 3—3 Fig. 2;

Fig. 4 is a cross-section, in elevation, as the same would appear, if taken on the line 4—4 Fig. 2;

Fig. 5 is a cross-section, in elevation, as the same would appear, if taken on the line 5—5 Fig. 3, and

Fig. 6 is a detail in section through the tub bottom showing a bracing means, and silencer against vibration and also the drain.

Like characters of reference denote corresponding parts throughout the figures.

The frame of the machine includes a plurality of standards or legs 1 having casters 2 at their lower ends for ease and convenience in moving the machine from place to place, and a series of preferably approximately circular frames 3, 4, and 5 superimposed in spaced relation, one above the other. The frames 3 and 5 are located at or near the bottom and top of the legs or standards, respectively, as shown, and may be flat bands, whereas the frame 4 is preferably an angle-iron band located intermediate the frames 3 and 5 and forms or provides the frame support on which the tub or container 6 rests, or is supported. The bottom 7 of this tub or container is dished or saucer shaped, as shown, its lowermost point being axially of the tub. It is strengthened or braced centrally by the preferably asbestos sheet or plate 8, next adjacent the outside of the bottom and held in place by the stiffening plate 9. Should there be any vibration of the tub bottom, due to the washing action the asbestos sheet or plate will act as a silencer to prevent rumbling or thumping. Both the sheet or plate 8 and the plate 9 have an opening 10 therethrough next adjacent the center or axis of the tub through which projects a coupling 11 secured to the tub bottom and in communication therewith to act as a drain and from said coupling a drain pipe 12 extends to one side of the tub and having a regulating or drain valve 13.

The washing element 14, arranged to be suitably supported and operated within the tub or container 6 may be an agitator or dolly of any desired or approved construction, and while detached to some extent is not specifically claimed herein and it is thought, therefore, need not be further referred to in detail. Suffice it to say, that such an agitator or dolly is arranged for clutch connection to

the upper end of a shaft passing up through the tub bottom 7 and arranged for operative connection with actuating mechanism located beneath the tub. As shown, the agitator or dolly may have a detachable connection with the upper end of the shaft 15 by means of a suitable coupling 16.

The bearing for the shaft 15 within the tub, comprises preferably upstanding tubular post or casing 17 arranged for insertion through an axial opening 18 in the tub bottom and plates secured thereto and beneath; the greater portion of said post or casing extending up into the tub, to a point preferably above the water line therein and with a short extension projecting below the tub, as shown. Said post or casing, is further provided, with a flanged member 19 at or near its lower end, between which and the upper inside face of the tub bottom a suitable gasket or packing 20 is inserted, to form or provide a seal against leakage, such flange and gasket or packing being drawn firmly down and against the tub bottom, in a manner to be explained.

The gear casing or housing, comprises preferably elongated and suitably shaped rather shallow superimposed sections 20 and 21, adapted to be removably attached to each other by bolts and nuts 22. When united and housing the operating gearing, such casing or housing is disposed diametrically of, below and next adjacent the bottom of the tub 6, as shown in Figs. 1 and 2 and the same secured to and held suspended from the frame 4 by means of bolts 23 connected to the frame 4 and said casing or housing and preferably passing through the spacing sleeves 24. The upper section 21, of said casing or housing, at a point, where it crosses and is coincident with the axis of the tub, is formed or provided with an overlying shell or casing 25 having an opening 26 therethrough and the head wall 27 thereof, when the gear casing or housing is secured in position, bears against the under side of the plate 9 secured to the under side of the tub bottom. Also when the gear casing or housing is secured in operative position, see Fig. 2, the shaft 15 passes down through the post or casing 17, through the upper wall of the section 21 and has bearing in the lower wall of the section 20. Furthermore, the lowermost end of the tubular post or casing 17 extends down, partway, into the overlying shell or casing 25 stopping short of the upper wall of the section 21, as shown. On the extreme lower end of the shaft 15 is slidably connected a pinion 28 arranged to be moved into and out of meshing relation with a segment gear or rack 29 pivotally supported within the gear casing or housing and to and within the section 20 and has connected thereto a pitman bar 30 in pivotal connection with a gear wheel 31, also journaled in said gear casing or housing and which is in mesh with

a driving pinion 32 on a short vertical shaft 33 journaled in the section 20 of the gear casing or housing and a supplemental housing 34 secured to and suspended below the section 20 of said gear casing or housing. On the lower end of said short shaft 33 is secured, a preferably crown gear wheel 35 with which meshes an ordinary spur gear wheel 36 on a short transverse shaft 37 to which is secured a pulley wheel 38 adapted to be driven from a suitable source of power and a belt, not shown. The use of a crown gear wheel for the transmission of the power from the driving shaft to the operating shaft 15 will eliminate the fine adjustments ordinarily found necessary in machines of this character and obviates the usual thrust which is noisy and makes possible an easy, smooth and noiseless running machine. If desirable to actuate a wringer mechanism, not shown, there may be provided the gear wheel 39 located within the gear casing or housing and in meshing relation with the gear wheel 31 from which it receives its power and said gear wheel 39 adapted to operate a vertically disposed shaft 40 from which power may be transmitted to the usual wringer mechanism not shown, although its support 41 is shown in Fig. 1.

The means employed to move the pinion 28 into and out of mesh with the segment gear or rack 29 is a levying arm 42 projecting up at the side of the machine and connected with a rod 43, see Fig. 3, which has secured to its nearer end the yoke 44 engaging a grooved collar 45 connected with the pinion 28, whereby upon the oscillation of the rod 43 the pinion may be alternately raised and lowered as shown in dotted and full lines in Fig. 5, so as to disconnect and connect said pinion with segment gear or rack 29. This arrangement, as will be understood, permits the motor to operate continuously when the machine is in use and yet provides a simple and convenient means for the attendant to connect and disconnect the actuating mechanism of the dolly with the source of power.

When the several parts described are in assembled and in operative relation, there is carried on the dolly or agitator operative shaft 15 and within the shell or casing 25 a flanged collar 46, preferably below the end of the tubular post or casing 17 which acts as a water shed to divert any casual water which may trickle down the shaft 15 from entering the gear casing or housing, which naturally would be detrimental to an efficient operation of the gearing journaled and operating within said gear casing or housing.

The tub 6 together with the tubular post or casing 17 are firmly clamped in position on the frame and to the gear casing or housing by means of a nut 47 which is screwed on to the threaded lower end of the tubular post or casing 17, as is best seen in Fig. 2 and between

said nut and the head wall 27 of the shell or casing 25 is interposed a gasket or washer 48 of suitable material.

The manner of assembling the tub 6, the operating shaft 15, the tubular post or casing 17, the gear casing or housing, and the firmly clamping together of the tub 6, the tubular post or casing 17 and the gear casing or housing constitute one of the novel and essential features of the structure hereinabove described. Assuming that the gear casing or housing is supported in suspended relation to and from the frame 4, the tub 6 is dropped into position between the legs or standards so as to rest on the frame 4 in the manner shown and with the plate 9 secured to the bottom of the tub in abutting relation with the head wall 27 of the shell or casing 25 superimposed on the section 21 of said gear casing or housing. The tubular post or casing 17 is then placed in position with its extreme lower end inserted through the axial opening 18 in the tub and the plates connected beneath and thereto. The lower end of said tubular post or casing will stop short of the upper wall of the section 21 of the gear casing or housing and within the shell or casing 25, as shown, superimposed thereon. The operating shaft 15 may be conveniently placed at the same time that the tubular post or casing 17 is positioned, with said operating shaft being inserted down and through the upper wall of the section 21 of the gear casing or housing and into operative relation with the pinion 28 arranged to have a slidable relation thereon. However, before, or at the same time that the tubular post or casing 17 and the operating shaft 15 are placed in position, the nut 47 and the flanged collar 46 are inserted through the opening 26 into and within the shell or casing 25 to be in axial alignment with said shaft and said tubular post or casing so that the flanged collar may have a snug fit on said shaft and embrace or surround the opening in the upper wall of the section 21 of the gear casing or housing in which said shaft has a bearing, as best seen in Fig. 2 and with the nut 47 in position to be screwed on to the lower threaded end of the tubular post or casing 17. It has already been explained that between the nut 47 and the head wall 27 of the shell or casing 25, a suitable gasket or washer is placed and a suitable gasket or washer placed between the flange 19 on the tubular post or casing 17 and the bottom wall of the tub. This structure seals the connection with the tub at this point against leakage and the nut 47 when screwed into position firmly clamps the tubular post or casing 17, the tub 6 and the gear casing or housing securely together. While the upper end of the tubular post or casing 17 is normally above the water line of the tub, should any water work itself down from the top of the operating shaft 15 and through the tubular post or casing 17, it

will be diverted at the lower end of said tubular post or casing 17 over the flanged collar 46 on to the top of the gear casing or housing and be prevented from entering such gear casing or housing around said operating shaft 15 where it has a bearing in the upper wall of the section 21 of said gear casing or housing. This condition is not likely to exist but as a safeguard I have provided this water shed in the form of the flanged collar 46.

As will be apparent power is transmitted from the shaft 37 through the pinion 36 and crown gear 35 to the gear wheel 31 which will impart reciprocal movement to the pitman bar 30 and oscillate the rack or segment gear 29 and alternately rotate the dolly shaft 15 in opposite directions, when the pinion 28 is in mesh with said rack. The pinion is arranged to be manually raised and lowered out of and into engagement with said rack, through and by means of the operator's lever 42.

What I claim is:—

1. In a washing machine, in combination, a frame including standards and connecting annular rings, a gear casing supported by and suspended from one of said rings, a tub adapted to rest on said last mentioned ring, a tubular post extending through the bottom of said tub, and a nut adapted to engage the lower end of said post to clamp the post and tub and casing together.

2. In a washing machine, in combination, a frame including standards and connecting annular rings, a gear casing supported by and suspended from one of said rings, a tub adapted to rest on said last mentioned ring, a tubular post extending through the bottom of said tub, a dolly shaft journaled in said post and casing, a nut adapted to engage the lower end of said post to clamp the post and tub and casing together, and a flanged collar on said shaft below the lower end of said post adapted to act as a water shed.

3. In a washing machine, a frame, a tub thereon, a gear casing located beneath said tub, means for suspending said casing from said frame, and means for clamping said casing and tub together, said clamping means located centrally of the tub.

4. In a washing machine, a tub having a saucer shaped bottom, and a vibration silencer for said bottom to prevent rumbling comprising a vibration silencing material lying next adjacent the bottom of said tub and a plate lying next adjacent to and below said material.

In witness whereof, I have hereunto affixed my hand this 29th day of June, 1925.

ALPHEUS W. ALTORFER.