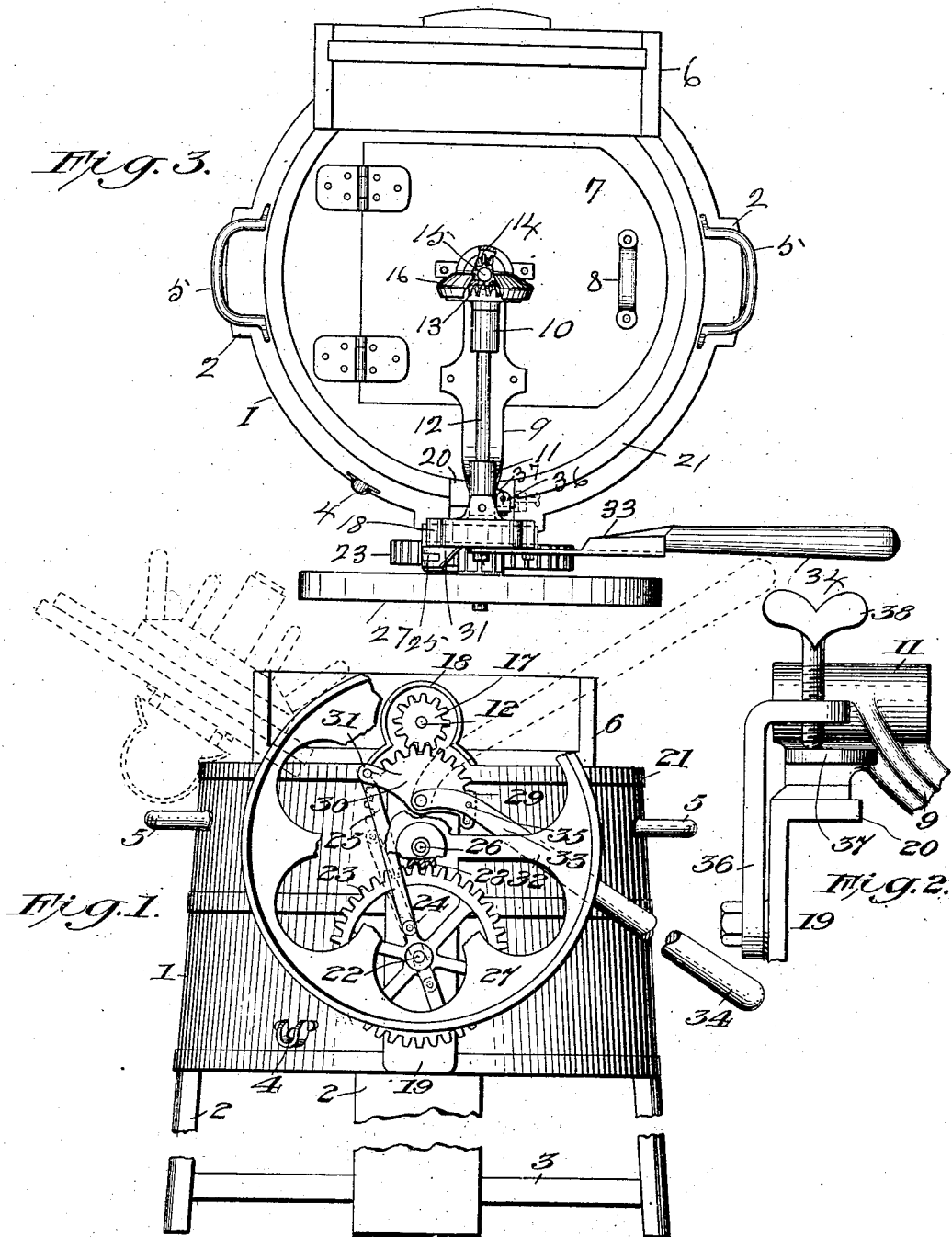


A. VAN WORMER.
GEARING FOR WASHING MACHINES.
APPLICATION FILED JAN. 13, 1908.

939,645.

Patented Nov. 9, 1909.



WITNESSES:

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939,645.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARBA VAN WORMER, a citizen of the United States, residing at Fort Wayne, in the county of Allen, in the State of Indiana, have invented certain new and useful Improvements in Gearing for Washing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in gearing for washing machines, of the type in which a continuous motion of the fly-wheel in one direction will produce an alternating rotary motion of the agitator shaft.

It is well known that in washing machines of the type where energy is stored up in a fly-wheel, actuated by speed increasing gearing, there are three known ways of mounting the fly-wheel mechanism, one is upon the top of the tub, in which construction it is generally necessary for the operator to lift the weight of such surmounted mechanism in opening and closing the lid; another way is to suspend such mechanism from the bottom of the tub and connect it to the agitator actuating gear by means of a series of levers; still another way is to mount the fly-wheel mechanism upon the side of the tub, and provide it with a detachable connection with the driving shaft, whereby the tub lid can be raised or lowered at pleasure without disturbing the fly-wheel mechanism.

The primary object of my present invention is to provide an improved gearing for washing machines of the type specified adapted to be compactly mounted upon the side of the tub, and having such a geared connection with the driving shaft that the tub lid can be raised and lowered at pleasure to remove or replace the agitator mechanism, without stopping the fly-wheel mechanism, and having an improved means for securing the detachable connection between the power shaft and the actuating gear therefor.

My invention consists of a horizontal power shaft rotatably mounted in suitable bearings on the tub lid, and adapted to impart to a common form of agitator shaft an alternating rotary motion; a fly-wheel rotatably mounted on the side of the

tub in right angular relation to the power shaft, and provided with a gear hub; a novel form of driving connection between the fly-wheel and the power-shaft, whereby a continuous rotation of the fly-wheel will impart an alternate rotary motion to the power shaft; and an adjustable hand lever for actuating the said driving connection.

The principal novel features of my invention reside in the construction of the fly-wheel and its driving connections with the power-shaft; and in the means for detachably securing the power shaft in gear with its actuating means, to admit of its being swung rearwardly with the lid.

Similar reference numerals indicate like parts in the several views of the drawings in which—

Figure 1 is a side elevation of a washing machine having my invention mounted thereon, both the tub and mechanism being partly broken away, the operating handle and the pitman being shown in dotted outline, and the lid with its surmounted power shaft and pendent agitator being also shown in dotted outline. Fig. 2 is an enlarged detail of the means for firmly securing the hinged lid and surmounted power-shaft in their normal position. Fig. 3 is a plan view of Fig. 1 partly broken away to show the meshing connection between the power shaft and the agitator shaft, and showing the relation between these shafts and the actuating means.

The tub 1 of any proper construction has suitable supporting legs 2 braced by proper cross-pieces 3, an outlet opening 4 in the side thereof, a pair of diametric handles 5, a detachable wringer rack 6 of any proper construction, and a hinged lid 7 having a handle 8, and provided with a vertical opening in which the upper end of the agitator shaft is loosely mounted.

On the lid 7 is rigidly fixed a common form of bracket 9 having the bearings 10 and 11 in which the horizontal power shaft 12 is rotatably mounted. This shaft is provided upon its inner end with a fixed bevel gear wheel 13 adapted for a meshing engagement with a fixed pinion 14 on the upper end of the agitator shaft 15 which has a bearing in the adjacent end of the bracket 9 in the usual manner. These two meshing gears 13 and 14 are provided with a suitable hood or shield 16 which is de-

tachably mounted on the lid 7, Fig. 3. The other end of the power shaft has a fixed pinion 17 which is also preferably provided with a detachable hood 18 mounted on the bearing 11.

On the side of the tub 1, approximately opposite the adjacent end of the bracket 9 is fixed the upright bracket or standard 19 whose upper end preferably has an inwardly projecting flange 20 adapted to rest upon the upper edge 21 of the tub, and thereby aid in supporting and imparting rigidly to the said standard when a considerable weight is supported as follows:

The standard 19 is provided near its lower end with a fixed pin or stud 22 on which is rotatably mounted a gear wheel 23 provided with an eccentric 24 to which the lower end of the pitman 25 is pivotally mounted.

On a stud-shaft 26 fixed in the standard 19 at a proper distance above the stud 22 is rotatably mounted the balance-wheel 27 having a novel form of bearing hereafter described, and provided with an inward extension of the hub whose perimeter has a series of gear teeth 28 adapted for a meshing engagement with the gear wheel 23, as shown in Fig. 1.

On a third stud 29 fixed in the standard 19 directly above the stud 26 is rotatably mounted the sector wheel or gear 30 having an extended laterally apertured bifurcated lug 31 in which the upper end of the pitman 25 is pivotally mounted, and provided upon its other end with lateral slot 32 for the purpose about to be described.

On the outer end of the stud 29 and immediately adjacent to the gear 30 is pivotally mounted the forward curved end of the lever 33 having a proper fixed handle 34. This lever 33 has a bolt 35 extending through the slot 32, and adapted to rigidly fix the said lever in any desired vertical adjustment by tightening up such bolt.

On the outer face of the upper end of the standard is pivotally mounted the short arm 36 whose upper laterally bent end normally overhangs a lateral lug 37 on the adjacent end of the bracket 9, and has a vertical screw-threaded perforation in which is mounted a thumb-screw 38 by which it is rigidly secured in position, as shown in Fig. 2, for the purpose hereafter described.

The bearing for the fly-wheel, as shown in Fig. 3, consists of a series of rollers 39 of proper dimensions compactly arranged about the periphery of the stud-shaft 26; a sleeve 40 snugly inclosing the shaft and rollers; and an annular plate 41 adapted to fit over the shaft against the outer ends of the rollers of the sleeve to prevent any derangement thereof in use. This annular plate in turn is held in place by a proper pin, not shown. By this construction the fly-wheel can be removed or replaced at pleasure with-

out the least tendency to derange the roller bearing.

The operation and manner of employing my invention thus described is obvious and briefly stated is as follows: The tub lid being closed and firmly secured in such position by means of the pivoted arm 36 and the thumb-screw 38, which at the same time rigidly secures the power-shaft in its normal position for the meshing engagement of the pinion 17 with the sector-gear 30, the operator drives the power-shaft first in one direction and then in another through the meshing connection of the sector-gear with the pinion 17 by the up and down operation of the handle 34, which thereby in turn correspondingly imparts an alternating rotary motion to the agitator shaft. This rocking movement of the sector-gear correspondingly rotates the large gear wheel 23 through the medium of the pitman 25, which in turn actuates the fly-wheel by a multiplied speed through the engagement of the wheel 23 with the hub gear 28. The energy of the hand-lever is thus transferred to and stored up in the fly-wheel, directly from the hand-lever independently of the power-shaft.

When access to the interior of the tub is desired the operator without stopping the machine, simply loosens the thumb-screw 38 and swings the arm 36 outward clear of the lug 37 after which he can readily lift the lid 7 upward by means of the handle 8, and swing it back to the position shown in dotted outlines in Fig. 1, thereby leaving the interior of the tub entirely clear of all mechanism.

The operator can as readily replace the lid with its surmounted mechanism without stopping the machine, after which it is rigidly secured in normal position by means of the arm 36 and the thumb-screw 38.

To insure the greatest security of the tub one leg thereof should be placed directly below the standard 19, as shown in Fig. 1, and for convenience the lifting handles 5 should be arranged in diametric relation on a line at right-angles to the power shaft.

Having thus described my invention and the manner of employing the same what I desire to secure by Letters Patent is:

1. In a washing machine gearing a rotary reciprocal vertical shaft; a rotary reciprocal horizontal shaft at right angles thereto; means for operatively connecting said shafts; an operating lever fulcrumed at its forward end independently of the horizontal shaft; means for operatively connecting the lever with the horizontal shaft consisting of a fixed pinion on the last mentioned shaft, and a sector gear connected to the lever, and engaging the undermost section of the pinion; a balance wheel whose axis is below the lever and in parallel relation with the horizontal shaft; and a pitman pivotally connected at

its upper end to the sector gear, and at its lower end to the balance wheel.

2. The combination with a rotary reciprocal vertical shaft, a rotary reciprocal horizontal shaft at right angles thereto, means for operatively connecting said shafts, of a lever fulcrumed at its forward end independent of said horizontal shaft, a sector gear adjustably mounted on the forward end of said lever, a fixed pinion on the horizontal shaft whose undermost segment is engaged by the sector gear, a balance wheel whose axis is below and parallel to said horizontal shaft, and means including a pitman for imparting motion from said sector to said wheel.

3. The combination with a rotary reciprocal vertical shaft, a rotary reciprocal horizontal shaft arranged at right angles thereto, means for operatively connecting said shafts, of a lever fulcrumed at its forward end independent of said horizontal shaft, a sector gear adjustably mounted on the forward end of said lever, a balance wheel whose axis is below and parallel to said horizontal shaft, a pitman whose upper end is pivotally connected to said sector and whose lower end is pivotally connected to the balance wheel, and a continuously revoluble gear on the adjacent end of the horizontal shaft in mesh with the said sector.

4. The combination with a rotary reciprocal vertical shaft, a rotary reciprocal horizontal shaft at right angles thereto, means mounted on the adjacent ends of said shafts for operatively connecting the same and a pinion on the opposite end of said horizontal shaft, of a lever fulcrumed at its forward end independent of said horizontal shaft, a balance wheel whose axis is below said lever and parallel to said horizontal shaft, a sec-

tor-gear carried by said lever and engaging the undermost segment of said pinion, a gear indirectly actuated by said lever for operating said wheel; and a pitman whose upper end is pivotally connected to the sector gear, and whose lower end is pivotally connected to the balance wheel.

5. The combination with a rotary reciprocal vertical shaft, a rotary reciprocal horizontal shaft at right angles thereto, means for operatively connecting said shafts, and a pinion on the outer end of said horizontal shaft, of a lever fulcrumed at its forward end whose axis is parallel to said last mentioned shaft, a sector-gear carried thereby and engaging the undermost segment of said pinion, a balance wheel and means including a pitman for imparting motion from said lever to said wheel.

6. The combination with a rotary reciprocal vertical shaft, a rotary reciprocal horizontal shaft at right angles thereto, means for operatively connecting said shafts, and a pinion on the outer end of said horizontal shaft, of a lever fulcrumed at its forward end whose axis is parallel to said last mentioned shaft, a sector-gear carried thereby and engaging the undermost segment of said pinion, a balance wheel and means including a pitman for imparting motion from said lever to said wheel, and means for rigidly securing the horizontal shaft and its support in their normal relation.

Signed by me at Fort Wayne, Allen county, State of Indiana, this 11th day of January, A. D. 1908.

ARBA VAN WORMER.

Witnesses:

AUGUSTA VIBERG,
AUGUSTE SPIEGEL.