No. 858,711. PATENTED JULY 2, 1907.

E. FREBERG.

GEARING.

APPLICATION FILED FEB. 12, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

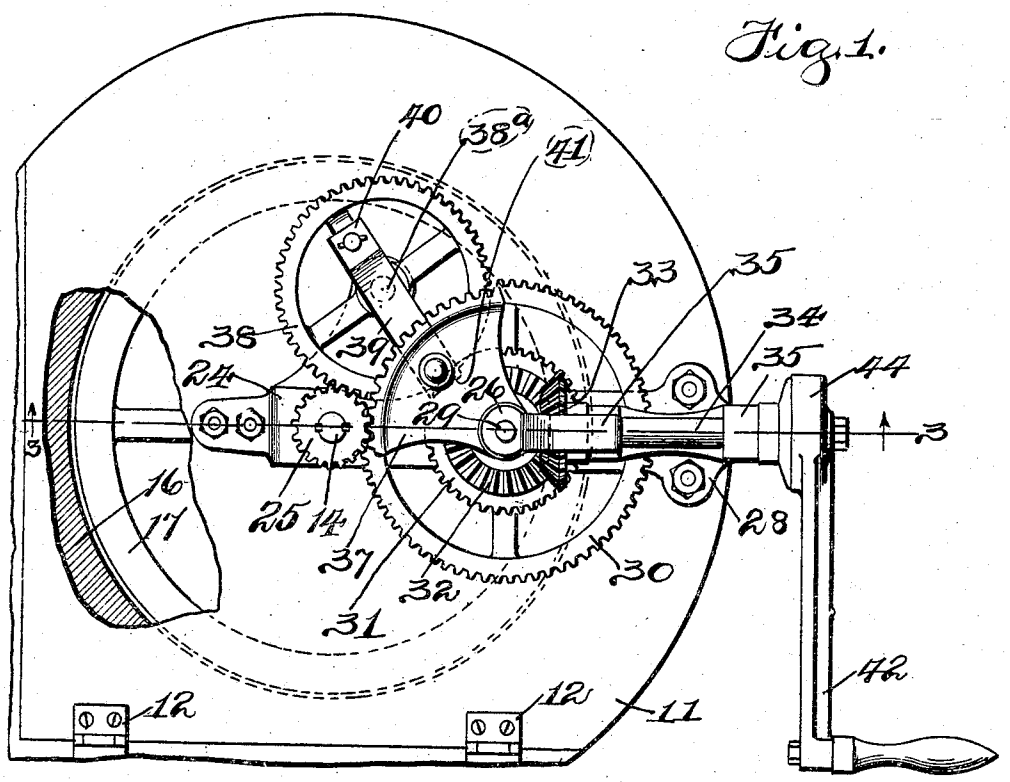
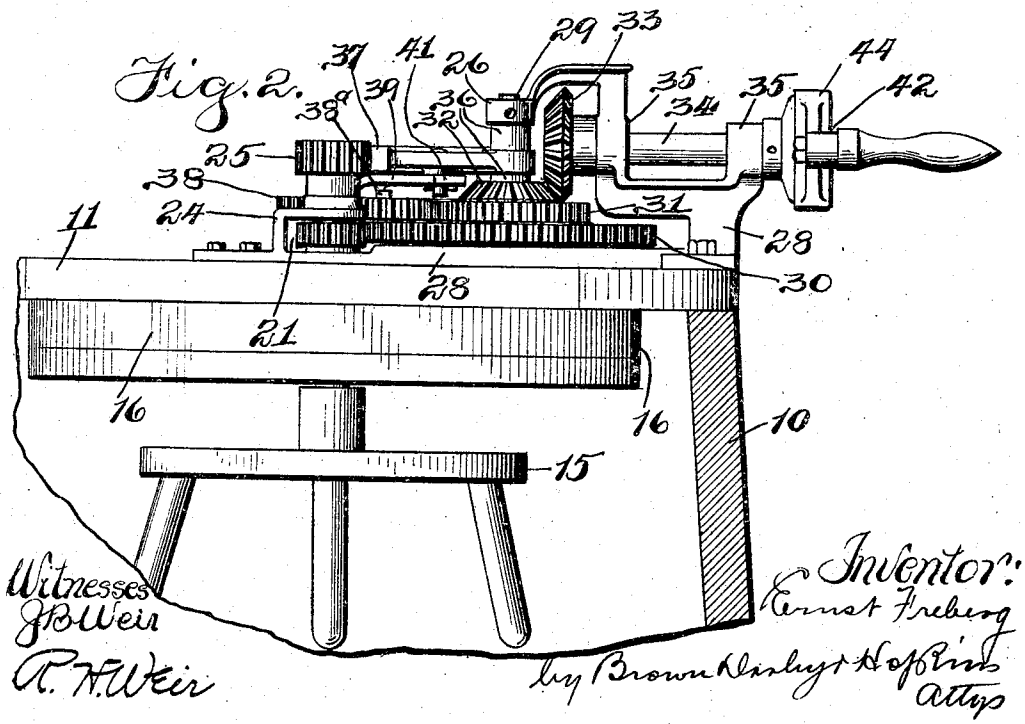


Fig. 2.



Witnesses
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2 SHEETS—SHEET 2.

Fig. 3.

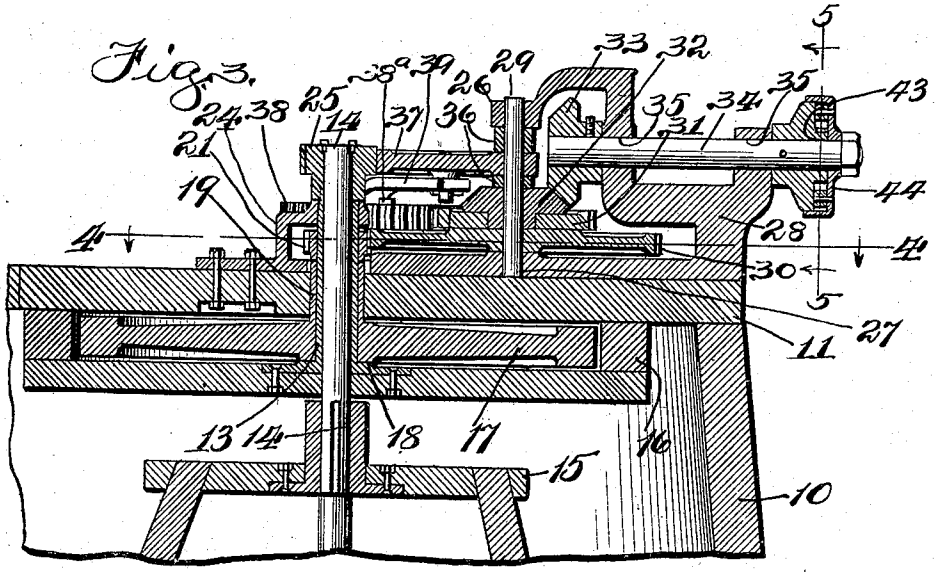


Fig. 4.

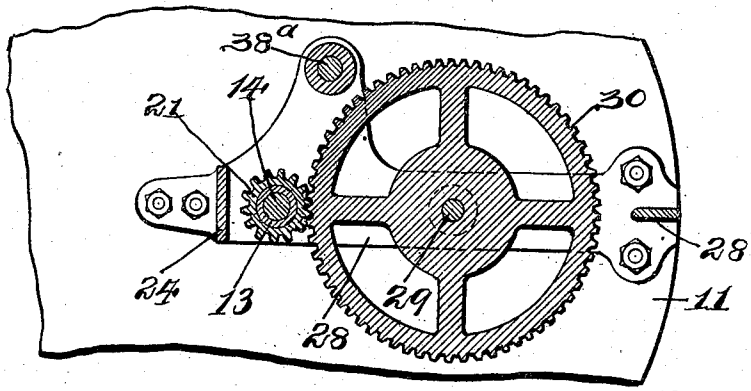


Fig. 5

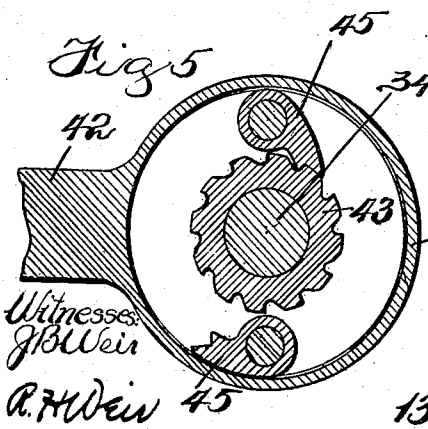


Fig. 6

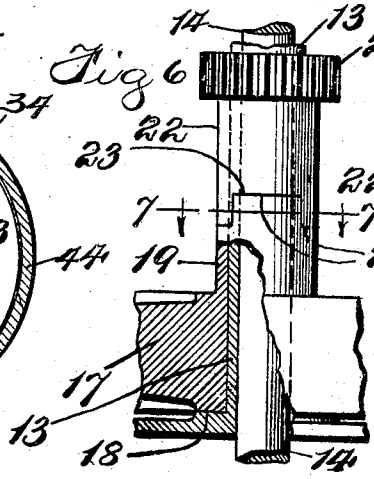
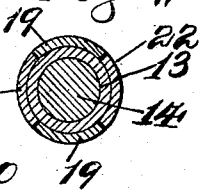


Fig. 7.



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UNITED STATES PATENT OFFICE.

ERNST FREBERG, OF TINLEY PARK, ILLINOIS, ASSIGNOR OF ONE-HALF TO PHILIPP H. DILG, OF CHICAGO, ILLINOIS.

GEARING.

No. 858,711. Specification of Letters Patent. Patented July 2, 1907.

Application filed February 12, 1906. Serial No. 300,696.

To all whom it may concern:

Be it known that I, ERNST FREBERG, a citizen of the United States, residing at Tinley Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gearing, of which the following is a full, clear, and exact specification.

This invention relates to improvements in washing machines, and more particularly to the mechanism for operating the dasher or rubber.

The object of the invention is to provide improved means for overcoming the dead center of the operating mechanism.

A further object is to provide an improved operating mechanism in which is employed a horizontally-rotating fly-wheel.

A further object is to provide an improved device of this character in which the fly wheel is mounted within the tub or receptacle.

A further object is to provide an improved device of this character which will be simple in construction and cheap to manufacture, and adapted to be effectively operated with a minimum amount of power.

To the attainment of these ends and the accomplishment of other new and useful objects, as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed, and shown in the accompanying drawings, illustrating an exemplification of the invention, in which,—

Figure 1 is a top plan view of a washing machine constructed in accordance with the principles of this invention, Fig. 2 is an elevation of the cover of a washing machine with the improved operating mechanism mounted thereon, and showing a portion of the tub or receptacle in section, Fig. 3 is a sectional view on line 3—3 of Fig. 1, looking in the direction of the arrows; Fig. 4 is a sectional view on line 4—4 of Fig. 3, also looking in the direction of the arrows; Fig. 5 is a sectional view on line 5—5 of Fig. 3; Fig. 6 is an enlarged detail view, partly broken away, of the fly wheel and bearing and operating gear; and Fig. 7 is a sectional view on line 7—7 of Fig. 6, looking in the direction of the arrows.

Referring more particularly to the drawings, in which the same reference numerals designate similar parts throughout the several views,—the numeral 10 designates a receptacle of any approved configuration, and 11 designates a cover or lid, suitably connected thereto by means of hinges 12. Passing through the cover or lid is a suitable sleeve or bearing 13, in which is journaled a shaft or rod 14. This rod or shaft projects for some distance into the tub or receptacle, and secured to the free end thereof in any suitable manner is a dasher head or rubber 15, of any desired construction.

Secured to or carried by the inside face or bottom of the cover or lid 11, is a housing or casing 16. The rod or shaft 14 and bearing 13 project through this housing, and loosely mounted upon the bearing 13, and within the housing, is a horizontally-disposed fly-wheel 17, which preferably rests upon a shoulder 18 surrounding the bearing. The hub 19 of the fly wheel 17 projects beyond the upper side of the wheel, and its face or extremity is notched or shouldered as at 20 (see Fig. 6). This notched or shouldered face may be located at any convenient point, but preferably adjacent the upper face of the cover 11, to afford easy access to the same. A pinion wheel 21, provided with a projecting sleeve or hub 22 also surrounds the bearing 13, with the sleeve portion 22 projecting in the direction of the sleeve or hub 19 of the fly wheel 17. This sleeve or hub 22 is also provided with a notched or shouldered face, as at 23, which corresponds and co-operates with the notched face 20 of the hub or sleeve 19 of the fly wheel 17, forming a loose or clutch connection, thereby permitting the parts to be detached, so that the fly wheel 17 or gear 21 may be separated when desired. The gear 21 is located preferably above and in close proximity to the upper face of the cover 11. The free extremity of the rod or shaft 14 projects beyond the pinion wheel 21, and through a suitable bearing 24, and secured to the free extremity of the shaft or rod 14, in any suitable manner, is a pinion or gear wheel 25, and said pinion or gear 25 is adapted to rest upon and be supported by the bearing 24, to prevent the rod or shaft 14 and the dasher head or rubber 15 from becoming accidentally displaced.

Mounted in suitable bearings 26—27 in a bracket 28 which is carried by and secured to the cover 11, and spaced from the rod or shaft 14, is a parallel shaft or axle 29. Mounted upon this axle are gears 30, 31, and bevel gear 32, preferably superimposed. These gears are secured in any desired manner to operate in unison, and the gear 30 is preferably somewhat larger than the gears 31 and 32, and stands within the same plane, and meshes with the pinion gear 21, which is connected to the fly wheel 17. The bevel gear 32 is preferably located above the gears 30 and 31, and is preferably of a diameter smaller than the gear wheel 31. Meshing with the bevel gear 32, is a gear 33, which is carried by a suitable shaft 34 mounted in bearings 35 in the bracket or casting 28.

Loosely mounted upon the axle 29, supported by suitable bearings 36, and preferably located above the

gear 32, is a toothed segment or gear 37, which meshes or engages with the pinion wheel or gear 25 carried by the free extremity of the rod or shaft 14, for transmitting motion to the said shaft or rod 14, in a manner to be set forth.

A gear wheel 38, suitably disposed, is preferably mounted upon an axle 38ª carried by the bracket 28. This gear wheel 38 is suitably spaced from, and meshes with the gear wheel 31, and preferably stands within the same plane as the gear wheel 31, and may be of any desired diameter. A link 39 is loosely connected by one end 40, in any suitable manner, to the gear wheel 38, at any desired point, preferably at a point located within the periphery of the said gear. The other end of the link 41 is loosely secured in any desired manner to the segment 37, and preferably to the lower face thereof. The point of connection of this end 41 of the link 39 with the segment 37 is so disposed that it will never assume a position in a direct line between the point of its connection 40 with the gear 38, and the point of pivotal support of the segment 37 with the axle 29.

A suitable crank handle 42 is connected to the free extremity of the shaft 34, by means of which said shaft is rotated. The crank handle and shaft 34 are provided with a clutch connection of any desired form and construction, which will permit the crank 42 to rotate the shaft, and then release said shaft to permit the same to continue to rotate when the crank 42 is at rest. A suitable form of clutch mechanism particularly adapted for this purpose, which is simple in construction and which is herein illustrated, comprises a ratchet wheel 43 (see Fig. 5) carried by the shaft 34. Mounted within a housing 44 which surrounds the ratchet wheel 43, are gravity pawls 45, which are adapted to engage the teeth of the ratchet wheel 43, as will be clearly understood.

The operation of this improved mechanism is as follows: The shaft 34 may be rotated by means of the crank handle 42. The gear 33, carried by the shaft 34, will rotate the superimposed gears 30—31, by means of the gear 32. The gear 30 will rotate the pinion 21, thereby continuously operating or rotating the fly wheel 17 in one direction while the shaft 34 is rotated. The gear 38, which meshes with the gear 31, will also be rotated as the two gears 30 and 31 rotate in unison, and the rotation of this gear 38 will, through the medium of the link or connection 39, transmit a reciprocating or oscillating movement to the segment 37, upon its point of pivotal support with the shaft 29. This segment meshing with the pinion 25, carried by the shaft or rod 14, will transmit an oscillating motion to the dasher head or rubber 15. The link or connection 39 is of such a length as to permit the gear 38 to make a complete and continuous rotation and at the same time prevent the pivotal point 41 from assuming a position in a direct line with the point of pivotal support for the segment 37 and the pivot point 40. As the gear revolves from the position as shown in Fig. 1, the link 39 will push or move the pivot point 41 to its extreme point of movement in one direction, causing the segment 37 to move about its pivot. This movement will cause the segment and pivot point 41 to assume a position which will permit the pivot point 40 on a continued rotation of the gear 38 to move about the axle 38ª of the gear. A further rotation of the gear 38 will cause the link 39 to draw or pull the segment about its pivot point until it assumes the position in Fig. 1 which is the limit of its return movement. Just as the segment reaches its extreme point of movement in either direction, it will assume a position of rest, to permit the position of the pivot point 40 to be changed with relation to the pivot point 41 by the continued rotation of the gear 38. The fly wheel being horizontally disposed and mounted within the tub or receptacle, and the gears being so compactly arranged, the danger of the operator coming in contact with any of the operating parts is entirely obviated.

It is to be understood that it is not desired to be limited to the exact sizes, proportions, construction and arrangement of the parts, as various changes may be made therein without departing from the spirit or the scope of this invention.

What is claimed as new is:—

1. In a device of the class described, the combination of a support, a shaft journaled to the support, means for oscillating the shaft, a housing carried by the support and surrounding the shaft, and a horizontally-disposed fly-wheel journaled within the housing and operatively related to the shaft-operating mechanism.

2. In a device of the class described, the combination of a support, a fly wheel journaled to the support and provided with a hub, a shaft journaled in and passing through the hub, operating mechanism operatively related to the hub and to the shaft, and means for driving the operating mechanism, for rotating the fly wheel in one direction and oscillating the shaft.

3. In a device of the class described, the combination of a support, a fly-wheel journaled to the support, and provided with a hub projecting through the support, a gear operatively related to the hub, a shaft journaled within and projecting through the hub,, a gear carried by the shaft, a driving gear journaled to the support and meshing with the fly-wheel gear, a segment pivotally mounted on the support and engaging the gear, connections between the segment and driving gear, and means for operating the driving gear to transmit a rotary motion to the fly-wheel and an oscillating motion to the shaft.

4. In a device of the class described, the combination of a support, a housing carried by the support, a fly wheel journaled to the support and within the housing, said fly wheel being provided with a tubular hub, a gear wheel operatively related to the hub, a shaft projecting through the hub, a gear wheel operatively related to the shaft and located adjacent the fly-wheel gear, a pivotally-supported segment engaging the shaft gear, a driving gear wheel meshing with the fly-wheel gear, means for rotating the driving gear, and connections between the driving gear and the segment for transmitting an oscillating movement to the segment when the driving gear is rotated.

5. In a device of the class described, the combination of a support, a horizontally-disposed fly-wheel journaled to the support and provided with a tubular projecting hub, a gear wheel operatively related to the hub, a shaft passing through the hub, a gear wheel operatively related to the shaft and located adjacent the fly-wheel gear, superimposed gears journaled on the support, one of said gears meshing with the fly-wheel gear, a supplemental gear meshing with another of the superimposed gears, a pivotally-supported segment engaging the shaft gear, a connection between the supplemental gear and the segment, and means for operating the superimposed gears to transmit a rotary motion to the fly wheel and an oscillating motion to the segment.

6. In a device of the class described, the combination of a support, a horizontally-disposed fly-wheel journaled to the support, a gear wheel operatively related to the fly wheel, a vertical shaft journaled to the support, a gear operatively related to the shaft, a supplemental gear mounted on the support, a pivotally-supported segment engaging the shaft gear, a link, one end of which is pivot-

ally connected to the segment, the other end having pivotal connection with the supplemental gear, the point of pivotal connection with the segment being disposed to one side of a direct line between the point of pivotal connection of the link with the supplemental gear and the pivotal point of support of the segment, a driving gear operatively related to the fly-wheel gear and the supplemental gear, and means for rotating the driving gear to transmit motion to the fly wheel and shaft.

7. In a device of the class described, the combination of a support, a horizontally-disposed fly-wheel journaled thereto, a gear wheel operatively related to the fly wheel, a shaft, a pair of superimposed gears journaled on the support, one of said gears meshing with and standing within the plane of the fly-wheel gear, a supplemental gear also journaled on the support, said gear being disposed within the same plane and meshing with the other of said superimposed gears, a pivotally-supported segment engaging the shaft gear, a link pivotally connecting the supplemental gear and segment, the point of connection of the link with the segment being located to one side of a direct line between its point of connection with the supplemental gear and the point of pivotal support of the segment, and means for rotating the superimposed gears, for transmitting a rotary motion to the fly wheel and an oscillating motion to the shaft.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 10th day of February A. D. 1906.

ERNST FREBERG.

Witnesses:
J. H. JOCHUM, Jr.,
CHAS. H. SEEM.