

T. W. CHAPMAN.
DRIVING GEAR MECHANISM FOR WASHING MACHINES.
APPLICATION FILED SEPT. 5, 1911.

1,011,577.

Patented Dec. 12, 1911.

2 SHEETS-SHEET 1.

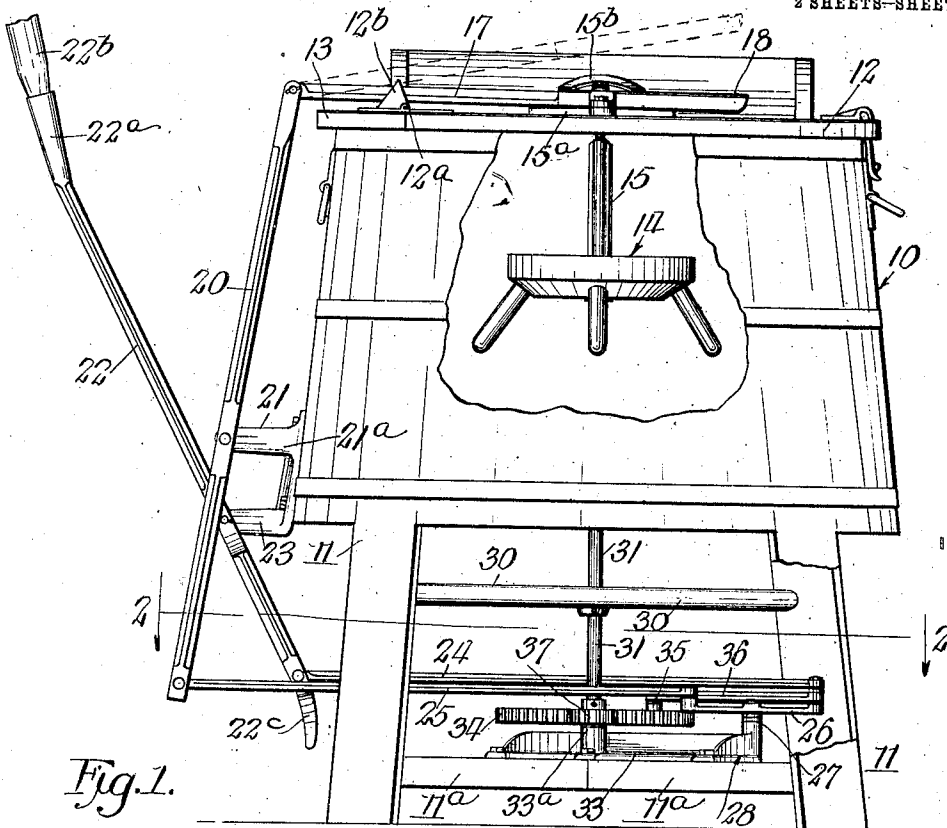


Fig. 1.

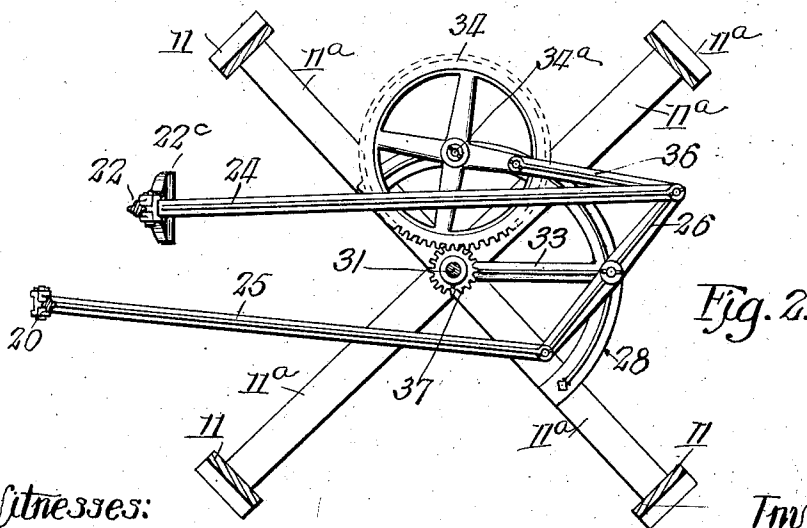


Fig. 2.

Witnesses:
P. H. Poole
D. H. K. K. K.

Inventor:
Theron W. Chapman.
by Poole & Brown
Attys.

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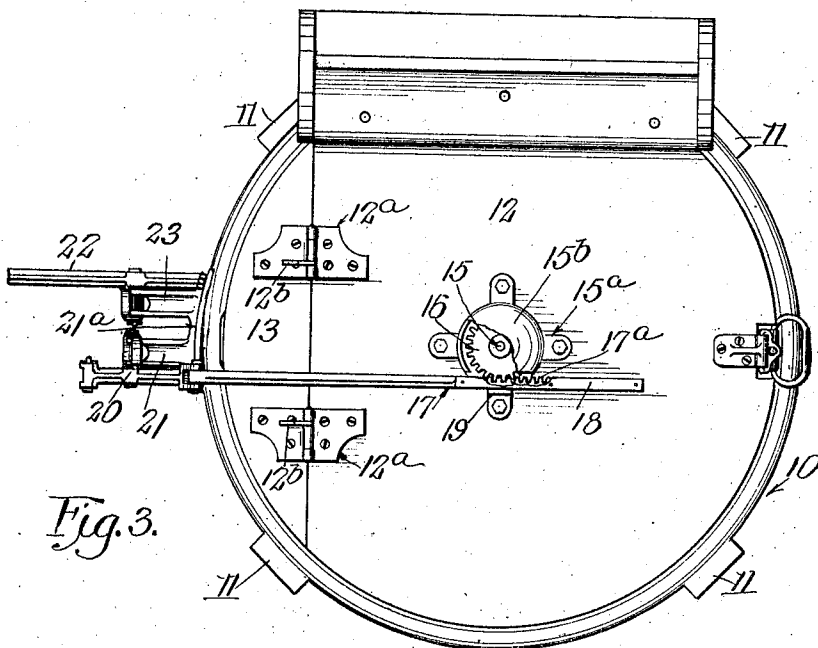


Fig. 3.

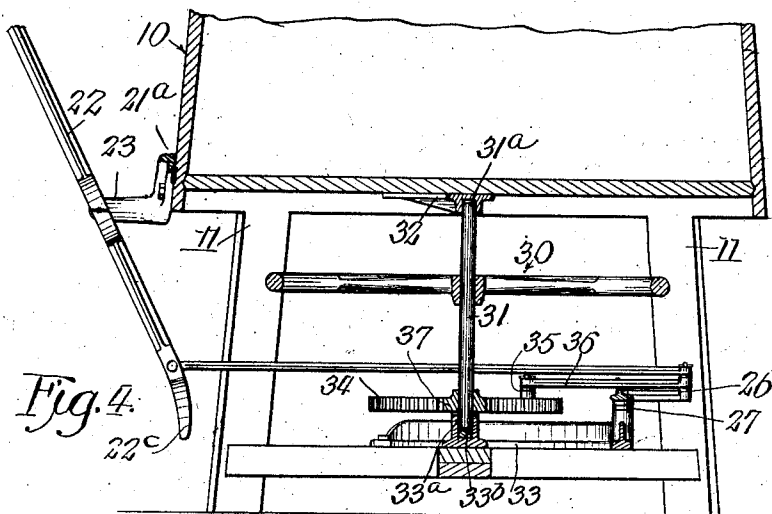


Fig. 4.

Witnesses:
 P. H. Poole
 J. H. Alfede

Inventor:
 Theron W. Chapman.
 by Poole & Brown Attys.

UNITED STATES PATENT OFFICE.

Theron W. Chapman, of Belvidere, Illinois, Assignor to National Sewing Machine Company, of Belvidere, Illinois, a Corporation of Illinois.

DRIVING-GEAR MECHANISM FOR WASHING-MACHINES.

1,011,577.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed September 5, 1911. Serial No. 647,767.

To all whom it may concern:

Be it known that I, THERON W. CHAPMAN, a citizen of the United States, and a resident of Belvidere, in the county of Boone and State of Illinois, have invented certain new and useful Improvements in Driving-Gear Mechanism for Washing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improvement in driving gear mechanism for washing machines and the like and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The invention as shown herein is applied to a washing machine of a familiar type comprising a tub or receptacle for containing the clothes and water, and provided with a beater mounted on a shaft depending through the lid into the tub and adapted to be given an oscillating rotary movement by the driving mechanism, so that the clothes are agitated by a stirring motion first in one direction and then in a reverse direction. The driving mechanism is of the high-speed, lever-operated kind and includes a fly-wheel adapted for continuous rotation in one direction by reason of which the effort required to operate the machine, once it has been started, is greatly reduced.

In the drawings:—Figure 1 is a view representing a front elevation of a washing machine provided with my improved driving mechanism. Fig. 2 is a view representing a horizontal section through Fig. 1 on the line 2-2 thereof. Fig. 3 is a view representing a top plan view of the washer. Fig. 4 is a view representing a vertical section through that part of the operating mechanism located below the tub.

Referring now to that embodiment of my invention illustrated in the drawings, 10 indicates the tub which is of familiar construction and has four upright legs 11, upon which it is supported. Said legs are rigidly braced apart near their lower ends by diagonally arranged bars 11^a, 11^b, which also, as will presently appear, act to support the part of the driving mechanism located below the tub. The tub has a hinged lid 12 con-

nected by hinges 12^a, 12^b, to a horizontal board 13 forming a part of the top closure of the tub. The hinges 12^a are provided on their leaves fixed to the board 12 with upright angular plates 12^b, 12^c, which form stops adapted to limit the swinging movement of the lid when the same is turned backward on its hinges, and to support the lid in open position.

14 indicates the usual beater, and 15 a shaft to the lower end of which said beater is rigidly secured, said shaft depending through an aperture in the hinged lid and being rotatively suspended therefrom by means of a bracket 15^a. Above the lid a spur-gear 16 is keyed to the beater shaft, and as shown in the drawing the bracket 15^a is provided with a casing 15^b inclosing said gear, so as to prevent the clothing or sleeve of the operator from becoming entangled therein. Oscillating rotative movement is imparted to said gear by means of a longitudinally reciprocating rod or bar 17 provided on one lateral edge with rack-teeth 17^a, which mesh with the teeth of the spur-gear 16. The rack-teeth 17^a are protected by a plate 18 secured to the top face of the bar 17 in position to cover said teeth. Said plate also acts to limit the downward movement of said rod by its engagement with the top faces of the teeth of the gear 16. The rack-teeth 17^a are held in engagement with the teeth of the gear 16 by means of an angle-bar 19 secured to the top of the lid 12 and having bearing engagement with the outer lateral edge of the bar 17.

One end of the bar 17 is pivotally connected to the upper end of a lever 20 which is fulcrumed intermediate its ends to a bracket-arm 21 secured to the side of the tub body. 22 indicates a prime-mover in form of a hand-controlled lever which is fulcrumed intermediate its ends and nearer its lower end to a bracket arm 23 secured to the side body of the tub. The levers 20 and 22 are so arranged as to swing in parallel vertical planes and the bracket-arms 21 and 23, as shown in the drawings, are made integral with a single base-plate 21^a which is bolted to the tub body. The lower ends of the two levers are operatively connected together by means of two parallel horizontal rods or links 24, 25, the one, 24, having pivotal connection with the lower end of the hand-lever

22, and the other, 25, having pivotal connection with the lower end of the lever 20, and by means of a walking-beam 26, which is pivotally connected at its opposite ends to the respective rods or links 24, 25. Said walking-beam 26 is pivotally mounted at a point midway of its ends to swing in a horizontal plane on a stud 27, which rises vertically from a bracket 28 secured to the braces 11^a which connect the legs of the tub. As shown, the bracket 28 consists of a semi-circular casting which is rigidly secured to the cross-braces 11^a. It is apparent from this construction that by oscillating the hand-lever 22 toward and away from the tub body, oscillatory movement will be imparted to the walking-beam 26 through the link 24 and that the said walking-beam will in turn, through the link 25, impart oscillatory movement to the lever 20 so as to reciprocate the bar 17 in a longitudinal direction. This movement of said bar produces oscillating rotative movement of the gear 16 and of the dolly-shaft 15 carrying the beater 14.

In order to impart momentum to the operating mechanism, thus carrying it over the dead points and reducing the effort required to operate it, a fly-wheel 30 is arranged to be rotated continuously in one direction by the operating mechanism. Said fly-wheel, as shown in the drawings, is located below the tub body on a vertical shaft 31, which has rotative bearing at its upper end in a socket 31^a formed in a bar 32 secured to the bottom wall 10^a of the tub, and having rotative bearing at its lower end in a socket 33^a formed in a bar 33 which, as illustrated, is in the form of an integral, radial arm of the semi-circular bracket 28 on which the walking-beam 26 is pivotally mounted. In the socket 33^a is located a half round ball 33^b which rests in the bottom of said socket and presents its upper rounded surface to the flat end of the fly-wheel shaft 31, which has thrust bearing against it. This construction provides a very simple anti-friction bearing for the fly-wheel so that it will rotate with little or no friction. On the shaft 31 above the bar 33 is fixed a pinion 37. 34 indicates a large gear in mesh with the pinion 37 and provided on its upper face with a crank-pin 35. Said gear 34 is rotatively mounted on a stud 34^a rising from the semi-circular bracket 28. A pitman 36 connects said crank-pin with the end of the walking-beam 26 to which the link 24 is connected. It is apparent that each oscillatory movement of the walking-beam 26 will be transformed by the pitman into a continuous rotary movement of the gear 34 and this, transmitted through the pinion 37, causes a continuous rotary movement of the shaft 31 and fly-wheel 30. Thus, by oscillating the hand-lever 22, oscillating rotary movement will be imparted to the

beater shaft and continuous rotary movement in one direction will be imparted to the fly-wheel 30.

When it is desired to open the hinged lid the bar 17 provided with the rack-teeth 17^a, which directly operates the beater-shaft, may be swung vertically upward out of the way on its pivotal connection with the hand-lever 22. Said hand-lever is preferably provided at its upper end with a socket 22^a to receive a wooden handle 22^b. For convenience in operating the lever 22, a stirrup 22^c is preferably formed at its lower end for working it by means of the foot.

I claim as my invention:—

1. Mechanism for operating washing machines and the like comprising in combination with a supporting body and an operating shaft rotatively supported thereby, a prime moving lever fulcrumed to the side of said body, a second lever fulcrumed to the side of said body and adapted to oscillate in a plane parallel to the plane of oscillation of said prime moving lever, a walking-beam pivoted to oscillate in a plane at right angles to the planes of oscillation of said levers, means operatively connecting said walking-beam with said levers, mechanism intermediate said second lever and said operating shaft adapted to impart oscillating, rotary movement to said shaft, a fly-wheel rotatively supported by said body, and means intermediate said walking-beam and said fly-wheel adapted to transform the oscillating movement of said walking beam into a continuous rotary movement of said fly-wheel.

2. Mechanism for operating washing machines and the like comprising in combination with a supporting body, and an operating shaft rotatively supported thereby, a prime-moving lever fulcrumed intermediate its ends to the side of said body, a second lever fulcrumed intermediate its ends to the side of said body and adapted to oscillate in a plane parallel to the plane of oscillation of said prime-moving lever, a walking-beam pivotally supported below said body, means operatively connecting said walking-beam with said levers, mechanism intermediate said second lever and said operating shaft adapted to impart oscillating, rotary movement to said shaft, a fly-wheel rotatively mounted below said body, and means intermediate said walking-beam and said fly-wheel adapted to transform the oscillating movement of said walking-beam into a continuous rotary movement of said fly-wheel.

3. Mechanism for operating washing machines and the like comprising in combination with a supporting body and an operating shaft rotatively supported thereby, a prime-moving lever fulcrumed intermediate its ends to the side of said body, a second lever fulcrumed intermediate its ends to the

side of said body and adapted to oscillate in a plane parallel to the plane of oscillation of said operating lever, a walking-beam pivoted below said body to oscillate in a horizontal plane, links connecting the opposite ends of said walking-beam with said levers, a longitudinally reciprocating rack-bar having pivotal connection with the upper end of said second lever, a gear on said operating shaft in mesh with said rack-bar, a horizontal fly-wheel rotatively mounted below said body, and means intermediate

said walking-beam and said fly-wheel adapted to transform the oscillating movement of said walking-beam into a continuous rotary movement of said fly-wheel.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 25th day of August A. D. 1911.

THERON W. CHAPMAN.

Witnesses:

FRANK L. GOODRICH,
CLARENCE B. ATWOOD.