

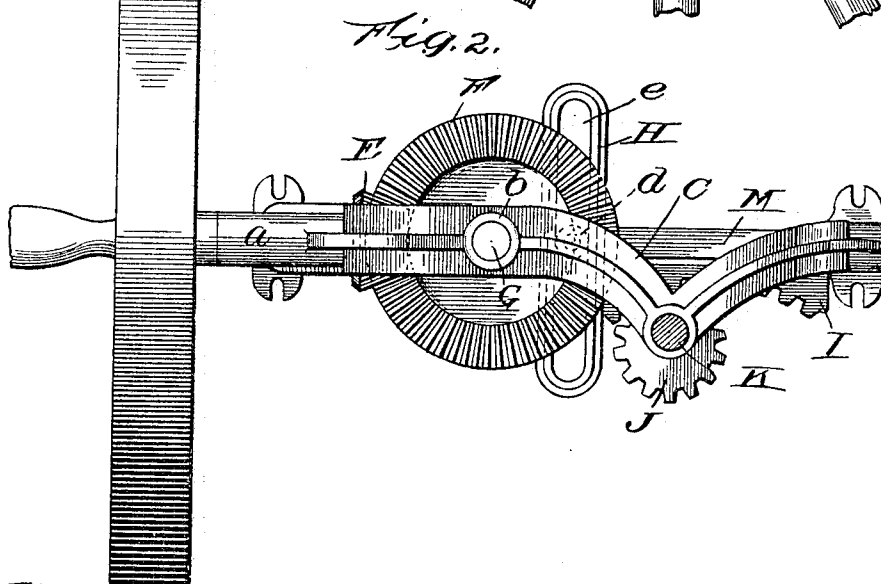
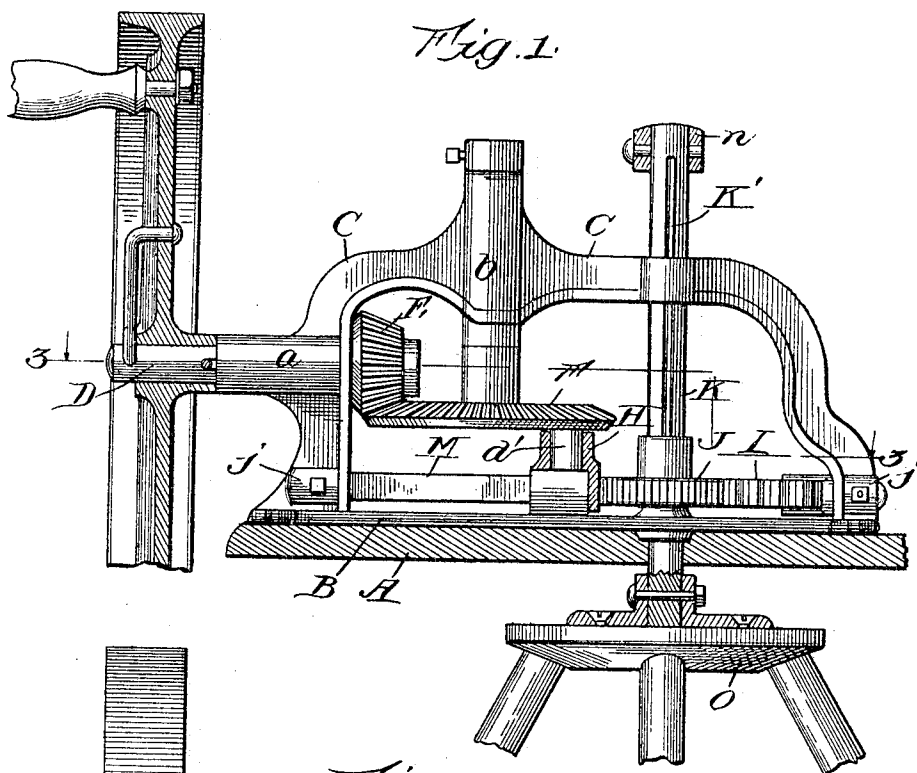
No. 798,847.

PATENTED SEPT. 5, 1905.

W. H. VOSS.
MOVEMENT FOR WASHING MACHINES.

APPLICATION FILED DEC. 24, 1904.

2 SHEETS-- SHEET 1.



Witnesses
O. M. Munnich
E. R. Lundy.

Inventor:
William H. Voss:
By Frank D. Thomason
Atty:

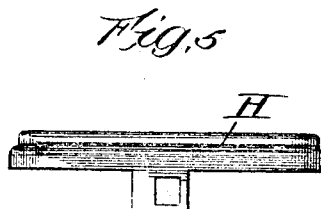
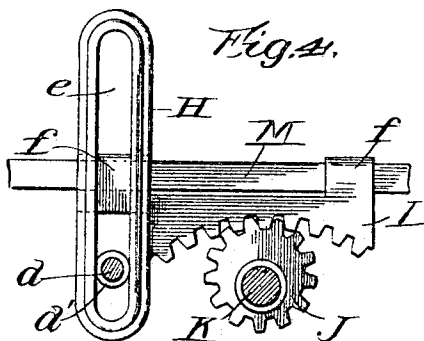
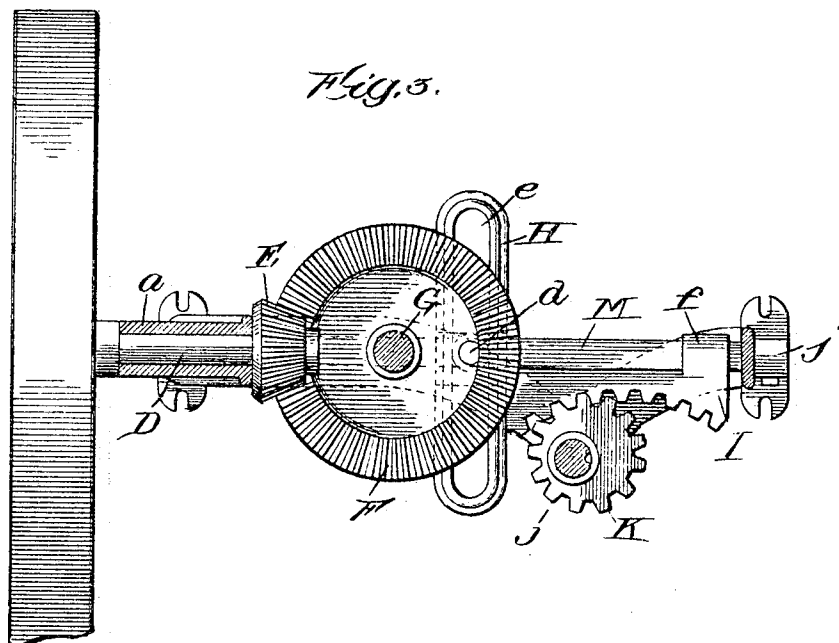
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2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM H. VOSS, OF DAVENPORT, IOWA.

MOVEMENT FOR WASHING-MACHINES.

No. 798,847.

Specification of Letters Patent.

Patented Sept. 5, 1905.

Application filed December 24, 1904. Serial No. 233,208.

To all whom it may concern:

Be it known that I, WILLIAM H. VOSS, a citizen of the United States, and a resident of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Movements for Washing-Machines, of which the following is a full, clear, and exact description.

The object of my invention is to provide a simple mechanical movement for converting a continuous rotary movement into a rotary reciprocal movement for washing-machines which utilizes the power applied to operate it in such manner that heavy work can be performed by the rotary reciprocal stirrer-shaft with the least possible effort. This I accomplish by the means hereinafter fully described, and as particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a portion of a washing-machine tub with my improvement applied thereto. Fig. 2 is a plan view of the same with the cover removed. Fig. 3 is a horizontal section taken on dotted line 3 3, Fig. 1. Fig. 4 is a detail view showing the relative position of the segmental rack and the eccentric pinion when the former is at the end of its stroke. Fig. 5 is a detail view of the segmental rack, looking at one end thereof edgewise.

Referring to the drawings, A represents the cover of a tub of a washing-machine, and B represents the base-plate of a supporting-frame C, which bridges over the same from end to end and affords bearings for the operative parts of my invention. The base-plate is arranged in a diametrical position on the cover, and the vertical portion of the supporting-frame arising from the end thereof nearest the circumferential edge of said cover is provided with horizontal bearings *a* for the continuously-revolving drive-shaft D. The inner end of drive-shaft D is provided with a beveled drive-gear E, which engages a larger horizontally-disposed gear F, secured on the lower end of a vertical spindle G, which latter is journaled in vertical bearings *b* in the horizontally-disposed reach of the supporting-frame. Secured in and depending from gear F is a stud *d*, which preferably has an anti-friction-roller *d'* thereon and enters and engages the walls of a slot *e*, extending lengthwise in the transverse end bar H, which latter is made integral with or is secured to one end of a longitudinally-reciprocal rack I. This rack I is provided at its ends with transverse guide-lugs *f f'*, which latter engages and slides

longitudinally back and forth upon a suitable guide-rod M. Rod M is preferably rectangular in cross-section and extends from one of the perpendicular legs of the supporting-frame C to the other and has its ends secured by set-screws in suitable sockets *j j'* in said legs. One of these sockets extends through the leg of the supporting-frame in which it is made, so as to permit of the guide-bar being introduced into or removed from place longitudinally.

The rack I may be perfectly straight and mesh with and engage a pinion J on the stirrer-shaft K, which latter is journaled in suitable bearings in both the overhead horizontal reach of the supporting-frame C and the base-plate B thereof and extends down through the latter and the cover A and has a suitable stirrer-head connected to its lower end. I prefer, however, not to make the rack straight, but to make it curved, so that its teeth will be arranged in a concave line, and I make the axis of the pinion J eccentric to its perimeter, so that the pitch-line of the gear will be nearer the axis of the stirrer-shaft when the pinion is engaging the ends of the rack than when it engages it midway said ends, as shown in the drawings. The object of thus arranging the teeth of the rack in a curved line and making the perimeter of pinion J eccentric to its axis is to vary the leverage brought to bear on pinion J at different points within the range of its movement that greater power may be exercised at the end of the rack where the reversing movement of the pinion takes place than at points mediate the same. The stirrer-shaft K is preferably provided with a longitudinal groove K' therein, and pinion J has an interiorly-projecting spline which enters said groove, so that said shaft must revolve with the pinion, but can have an independent longitudinal movement of its own, so as to enable it to automatically accommodate itself to the volume of work engaged by the stirrer-head O on the lower end of the same. The upper end of the stirrer-shaft is provided with a suitable collar *n* to prevent the shaft K from falling out of its bearings. While I prefer shaft K to have this independent vertical movement, such movement may be dispensed with.

In operation the drive-shaft through the medium of the drive-gear E revolves the horizontally-disposed beveled gear F, and the latter by means of a downwardly-projecting stud *d* engages a transverse slot in one end of and

reciprocates rack I. The rack I slides back and forth on a horizontally-disposed guide-bar M and engages the pinion J and through it imparts a rotary reciprocal movement to the stirrer-shaft.

What I claim as new is—

1. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, a pinion thereon, a reciprocal rack having transversely-slotted means engaged by said stud for actuating said rack, and a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled.

2. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion, the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft, having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, an eccentric pinion thereon, a reciprocal curved rack having transversely-slotted means engaged by said stud for actuating said rack, and a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled.

3. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion, the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, a pinion thereon, a reciprocal rack having transversely-slotted means engaged by said stud for actuating said rack, and a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled.

4. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion, the

shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, a pinion thereon, a reciprocal rack provided with perforated guide-bosses having transversely-slotted means engaged by said stud for actuating said rack, a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled, and a horizontal longitudinally-disposed guide-bar engaged by said guide-bosses the ends of which are secured near the bases of the uprights of the arch portion of the supporting-frame.

5. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion, the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, a pinion thereon, a reciprocal rack provided with perforated guide-bosses having transversely-slotted means engaged by said stud for actuating said rack, a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled, and a horizontal longitudinally-disposed guide-bar engaged by said guide-bosses the ends of which are removably secured near the bases of the uprights of the arch portion of the supporting-frame.

6. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion, the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, a pinion thereon, a reciprocal rack having a transversely-slotted frame at the end thereof under the suspended horizontal gear, said slotted frame being engaged by said stud for actuating said rack, and a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled.

7. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended

horizontal gear engaged by said pinion, the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft, having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, an eccentric pinion thereon, a reciprocal curved rack having a transversely-slotted frame at the end thereof under the suspended horizontal gear, said slotted frame being engaged by said stud for actuating said rack, and a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled.

8. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion, the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, a pinion thereon, a reciprocal rack having a transversely-slotted frame at the end thereof under the suspended horizontal gear, said slotted frame being engaged by said stud for actuating said rack, and a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled.

9. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion, the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the

upper end of which extends above its upper bearing, a pinion thereon, a reciprocal rack provided with perforated guide-bosses having a transversely-slotted frame at the end thereof under the suspended horizontal gear, said slotted frame being engaged by said stud for actuating said rack, a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled, and a horizontal longitudinally-disposed guide-bar engaged by said guide-bosses the ends of which are secured near the bases of the uprights of the arch portion of the supporting-frame.

10. In a mechanical movement a horizontally-disposed continuously-revolving drive-shaft, a pinion fast on one end thereof, a suspended horizontal gear engaged by said pinion, the shaft of which is independent of the other parts of the movement and arranged at right angles to said drive-shaft having its bearing entirely above said gear, which latter has a stud projecting down from its under face, of a vertically-movable rotary reciprocal shaft the upper end of which extends above its upper bearing, a pinion thereon, a reciprocal rack provided with perforated guide-bosses having a transversely-slotted frame at the end thereof under the suspended horizontal gear, said slotted frame being engaged by said stud for actuating said rack, a suitable supporting-frame arching over said gearing in which said drive-shaft, shaft of the horizontal gear, and the rotary reciprocal shaft are independently journaled, and a horizontal longitudinally-disposed guide-bar engaged by said guide-bosses the ends of which are removably secured near the bases of the uprights of the arch portion of the supporting-frame.

In testimony whereof I have hereunto set my hand this 15th day of November, A. D. 1904.

WILLIAM H. VOSS.

Witnesses:

WILLIAM E. PULS,
CHARLES E. MEARNES.