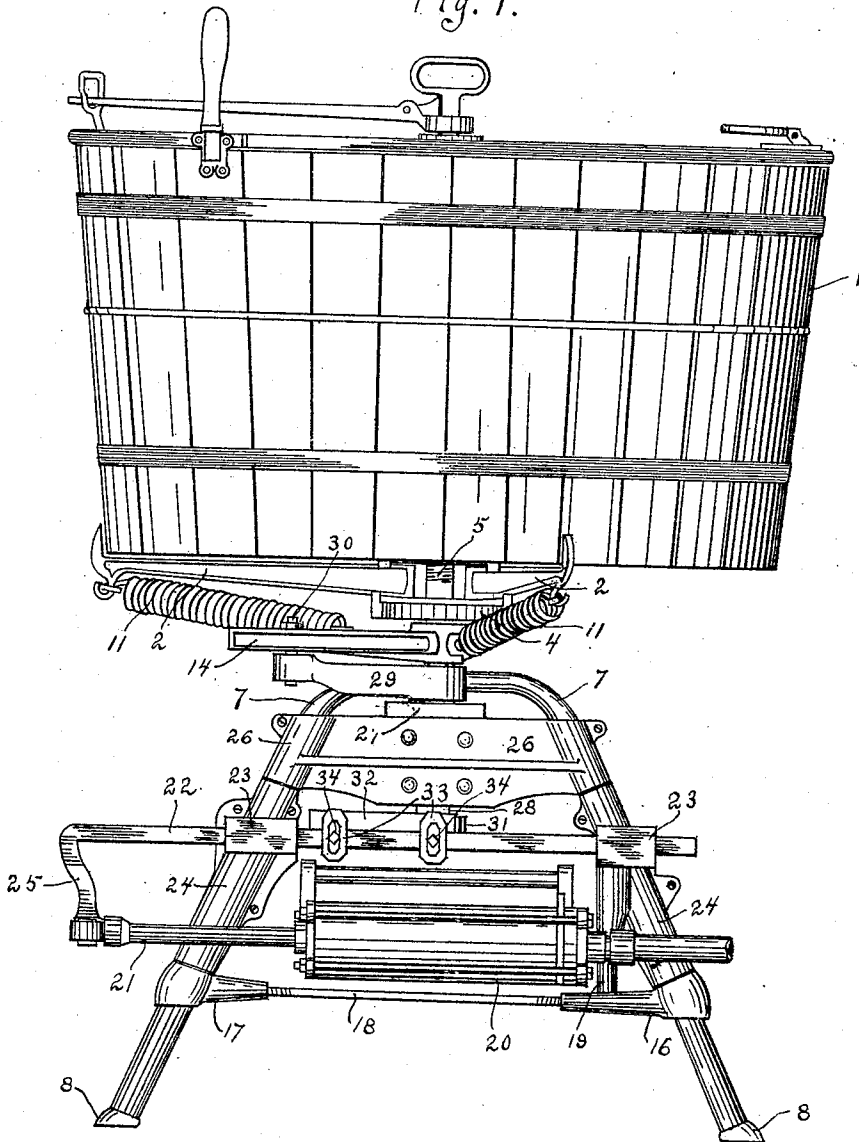


K. E. BILLS.
DRIVING MECHANISM FOR WASHING MACHINES.
APPLICATION FILED APR. 14, 1909.

944,656.

Patented Dec. 28, 1909.
2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

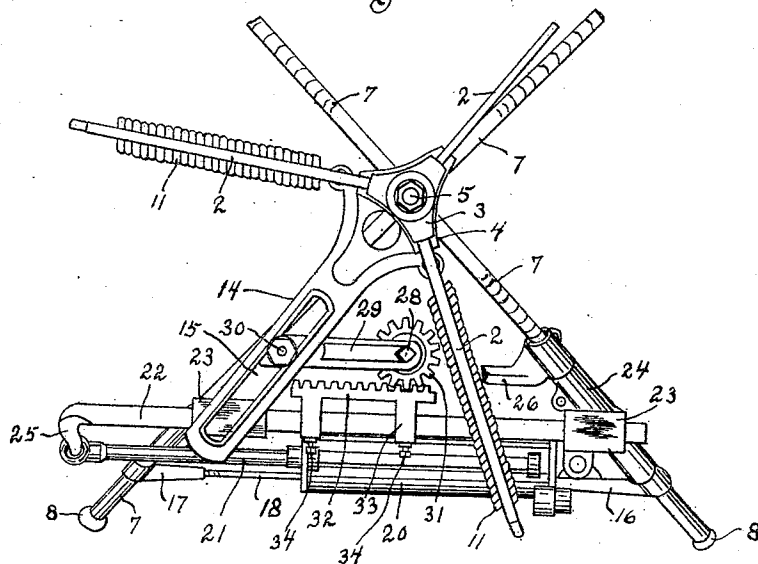


Fig. 3.

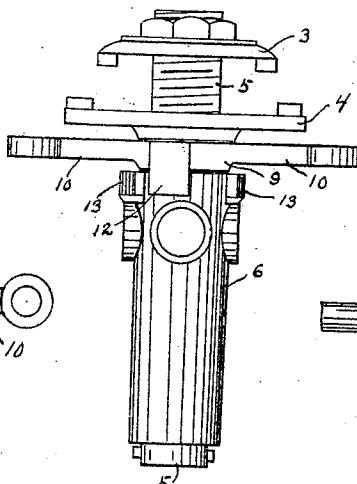


Fig. 4.

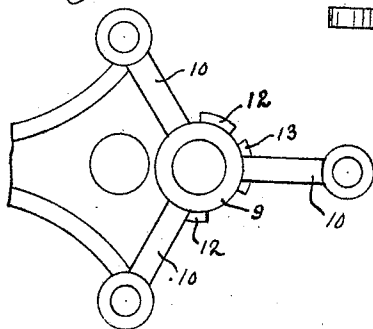
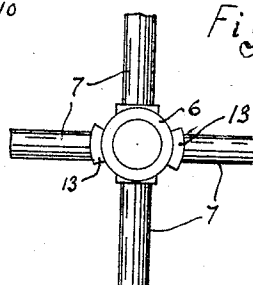


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

KENDRICK E. BILLS, OF STERLING, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO ARTHUR B. COOLING, OF STERLING, ILLINOIS.

DRIVING MECHANISM FOR WASHING-MACHINES.

944,656.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed April 14, 1909. Serial No. 489,946.

To all whom it may concern:

Be it known that I, KENDRICK E. BILLS, a citizen of the United States, residing at Sterling, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Driving Mechanism for Washing-Machines, of which the following is a specification.

My invention has reference to driving mechanism for washing machines, and is more specially adapted to be used with washing machines wherein the power to operate the same is derived from mechanism having a reciprocating movement.

The chief purpose of my device is to provide means for converting such reciprocating movement into an oscillating motion, and apply such latter movement to the tub of the machine, with an increased amount of play.

The parts of my invention are so constructed as to be readily attached to the frame of the machine, below the tub, so as not to interfere in any way with the opening or closing of the tub, or operation of the machine. The main operating devices are also supplemented by means for permitting a limited amount of oscillation to the tub, independently of the movement of said devices.

The construction, arrangement, and operation of the various mechanical parts which comprise my invention will be more fully set forth in the following specification.

In the drawings: Figure 1 is a front elevation of a washing machine embodying my invention. Fig. 2 is a detail of a portion of the frame of the machine, with my devices attached thereto. Fig. 3 is an enlarged detail, showing the central hub of the frame, and appurtenant parts, in side view. Fig. 4 is a plan view thereof, with the pivot, and clamp plates 3 and 4 removed. Fig. 5 is a plan view of the hub 6, in detail.

Similar numbers refer to similar parts throughout the several figures.

1 represents a tub, which may be of any usual pattern, of that class which is designed to oscillate upon a pivotal point. The tub 1 is supported upon a plurality of

arms 2, held between clamp-plates 3 and 4, fixed on the upper end of a pivot 5. The pivot 5 is rotatably mounted in a hub 6, provided with radial legs 7 extending outwardly and downwardly therefrom. The legs 7 are preferably of tubular form, and are provided at their lower ends with feet 8, inserted therein.

Interposed between the lower clamp-plate 4 and the hub 6 is a sleeve 9, having radial arms 10 corresponding in number with the arms 2, and connected by contractile coiled springs 11 with the arms 2, near the outer ends thereof, the tendency of such springs being to keep the several pairs of arms 2 and 10 in alinement. The sleeve 9 is also provided with a pair of downwardly projected lugs 12, adapted to engage a pair of lugs 13 on the upper end of the hub 6, and limit the movement of the sleeve 9 in either direction. Integral with the sleeve 9 is an arm 14, projecting outwardly therefrom, and provided with a slot 15.

Supported on one of the pairs of legs 7 are clips 16 and 17, united by a rod 18, removable therefrom. On the clip 16 is a bearing 19, upon which an ordinary water motor 20 is pivotally supported at one of its ends, and 21 is the reciprocating piston-rod thereof. A rod 22, preferably rectangular in cross-section, is supported in bearings 23, integral with sleeves 24, removably secured to the legs 7. This is preferably accomplished by having the sleeves formed in two corresponding halves, held together by small bolts or similar fastening means. The rod 22 is provided at one end with a downwardly turned member 25, loosely connected with the end of the piston-rod 21.

A plate 26 is removably attached to the legs 7 above the sleeves 24, and secured thereto is a bearing 27, in which is journaled a vertical shaft 28. On the upper end of the shaft 28 is fixed an arm 29, provided at its outer end with a wrist-pin 30, engaging the slot 15 in the arm 14. On the lower end of the shaft 28 is secured a pinion 31 engaged by a rack 32, supported on the rod 22 by means of arms 33, secured thereto by means of set-screws 34.

In operation, the reciprocation of the piston-rod 21 gives a corresponding movement to the rod 22, and the movement of the rod 22 is communicated through the rack 32, pinion 31, shaft 28 and arm 29 to the arm 14, giving thereto an oscillating movement, the outer end of the arm 29 describing approximately a half-circle in each oscillation thereof. By employing an arm 29 of suitable length a greatly increased movement is obtained at the outer end thereof over the somewhat limited movement of the rod 22, giving a correspondingly greater movement to the arm 14. The oscillation of the arm 14 rocks the sleeve 9 and arms 10 thereof, a corresponding movement being imparted to the arms 2 and tub 1 through the springs 11. As before mentioned, the movement of the sleeve 9 is limited by the lugs thereon coming in contact with the lugs 13, but upon such contact the movement of the tub is not immediately arrested, as the springs 11 permit a further oscillation thereof. This not only precludes a breakage of the parts which might result through the sudden stoppage of the tub, but upon the expansion of the springs the tension thereof aids in starting the movement of the tub in the opposite direction, and renders the action thereof more uniform and steady.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is:

1. A device of the class named, comprising a frame; a plurality of tub-supporting arms, pivotally mounted on said frame; a motor, mounted on said frame, and provided with a reciprocating piston-rod; a rod, mounted on said frame, and adapted to be reciprocated by said motor; a crank-arm, pivotally mounted on said frame; means for imparting the movement of said rod to said crank-arm, to oscillate the same; a slotted arm, pivotally mounted on said frame, and engaged by said crank-arm; and means for imparting the movement of said slotted arm to said tub-supporting arms, to cause the oscillation thereof.

2. A device of the class named, comprising a frame; a pivot, mounted centrally thereof; a plurality of tub-supporting arms, secured to the upper end of said pivot; a sleeve on said pivot, provided with a plurality of radial arms; springs connecting said arms with said tub-supporting arms; a water-motor, mounted on said frame, and provided with a reciprocating piston-rod; a rod, mounted in bearings on said frame, and adapted to be reciprocated by said piston-rod; a crank-arm, pivotally supported on said frame; means for imparting the movement of said rod to said crank-arm, to oscillate the same; and means for communicating the movement of said crank-arm to

said sleeve, to impart an oscillating movement to the arms thereof.

3. A device of the class named, comprising a frame; a pivot, mounted centrally thereof; a plurality of tub-supporting arms, secured to the upper end of said pivot; a sleeve on said pivot, provided with a plurality of radial arms; spring connecting means uniting the outer ends of said arms with said tub-supporting arms; a water-motor, mounted on said frame, and provided with a reciprocating piston-rod; a rod, mounted in bearings in said frame, and adapted to be reciprocated by said piston-rod; a crank-arm, pivotally supported on said frame; means for imparting the movement of said rod to said crank-arm, to oscillate the same; means for communicating the movement of said crank-arm to said sleeve, to impart an oscillating movement to the arms thereof; and means for limiting the oscillation of said arms.

4. In a device of the class named, a frame, comprising a central hub and supporting legs therefor; a plurality of tub-supporting arms, pivotally mounted on said hub; a crank-arm, removably supported on said frame; a pair of bearings, detachably attached to said frame; a reciprocating rod, supported in said bearings; a water motor, detachably secured to said frame, and adapted to actuate said rod; means for imparting the movement of said rod to said crank-arm, to oscillate the same; and means for communicating the movement of said crank-arm to said tub-supporting arms.

5. In a device of the class named, the combination of a frame; a plurality of tub-supporting arms, pivoted thereon; a water-motor, supported on said frame; a reciprocating bar, adapted to be actuated by said motor; a rack on said bar; a pinion, engaged by said rack; a crank-arm, actuated by said pinion; a plurality of radial arms, pivotally mounted on said frame; a slotted arm, connected with said last-named arms, and adapted to be actuated by said crank-arm; springs connecting said radial arms with said tub-supporting arms, and means for limiting the movement of said radial arms in each direction.

6. In a device of the class named, a central hub, provided with outwardly projected lugs; supporting legs for said hub; a pivot, mounted in said hub; a plurality of tub-supporting arms fixed to said pivot; a sleeve supported on said pivot, between said arms and hub, having a plurality of radial arms, and lugs adapted to engage said first-named lugs, to limit the movement of said sleeve in each direction, and provided further with a slotted arm projected outwardly from said sleeve; springs connecting the arms on said sleeve with the tub-supporting arms; a

crank-arm, pivotally mounted on said frame,
and adapted to actuate said slotted arm; a
rod, reciprocatingly mounted on said legs,
and adapted to be actuated by a water
5 motor; and means for imparting the move-
ment of said rod to said crank-arm, to oscil-
late the same with an increased movement.

In testimony whereof I affix my signature
in presence of two witnesses.

KENDRICK E. BILLS.

Witnesses:

W. N. HASKELL,
I. L. WEAVER.