

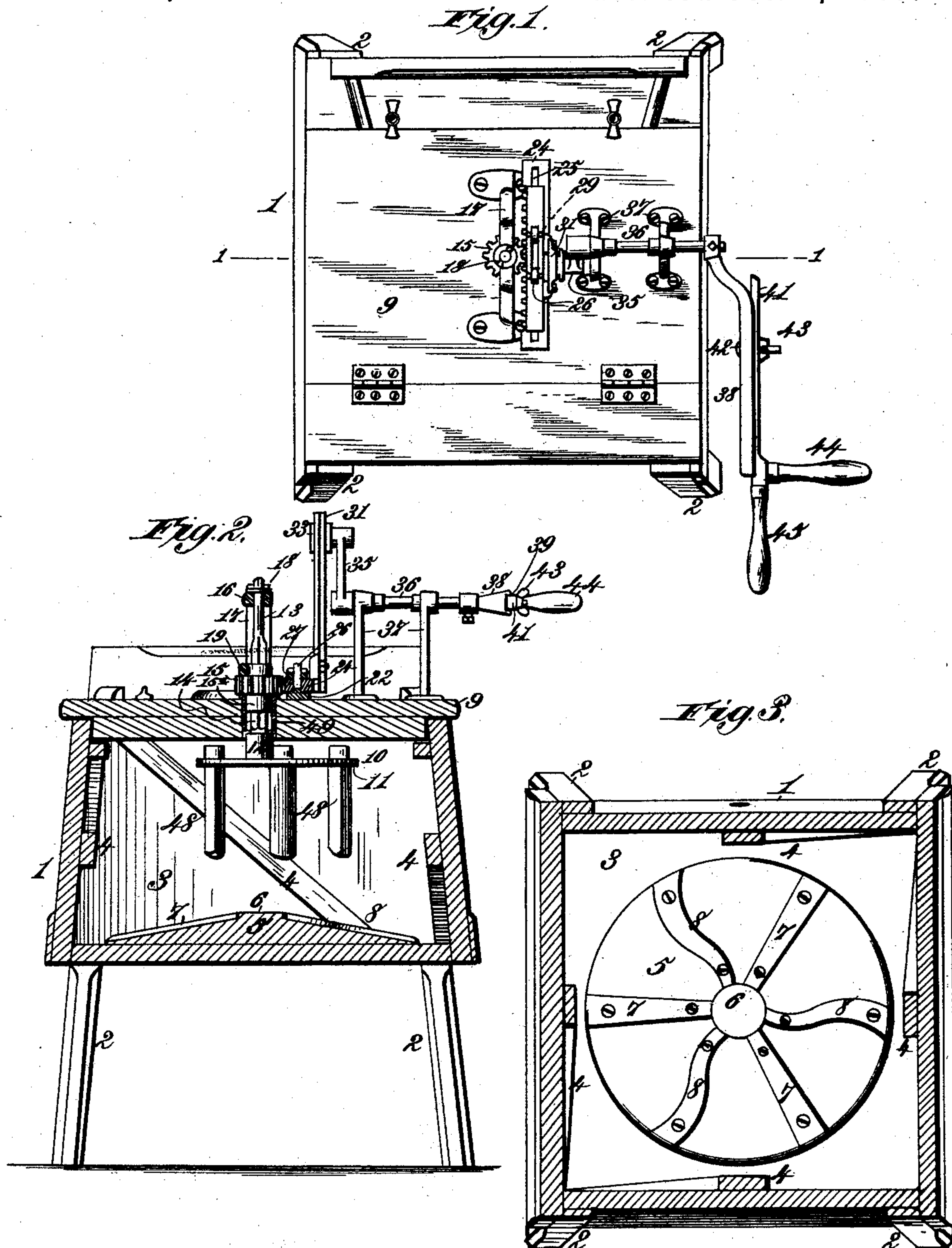
(No Model.)

2 Sheets—Sheet 1.

J. C. CROPPER.  
WASHING MACHINE.

No. 371,125.

Patented Oct. 4, 1887.



Witnesses:  
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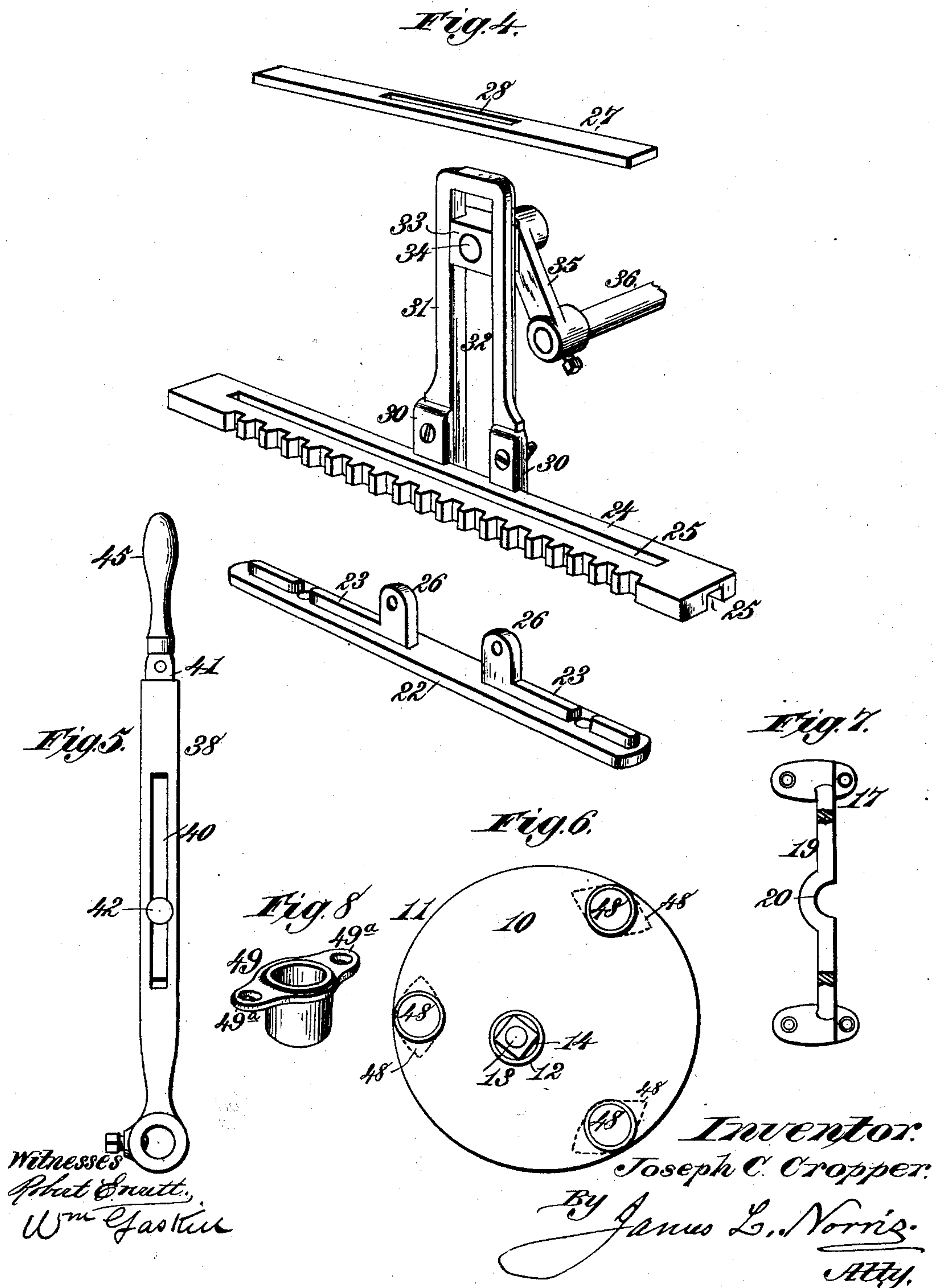
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# UNITED STATES PATENT OFFICE.

JOSEPH C. CROPPER, OF CEDAR FALLS, IOWA.

## WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 371,125, dated October 4, 1887.

Application filed May 26, 1887. Serial No. 239,446. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH C. CROPPER, a citizen of the United States, residing at Cedar Falls, in the county of Black Hawk and State of Iowa, have invented new and useful Improvements in Washing-Machines, of which the following is a specification.

My invention relates to washing-machines of that type in which a rotary beater operates with reciprocatory movement within a closed tank or receptacle; and it is the purpose of my invention to provide, first, a simple and convenient construction whereby the operative parts may be driven either by the continuous rotary motion of a crank or by the vibration of a lever at the pleasure of the operator thereby permitting a standing or sitting posture at will; second, to provide a simple construction whereby the reach or acting distance of the operating lever or crank may be lengthened or shortened in proportion to the load carried by the beater; third, to simplify and improve the construction and arrangement of the gearing by which motion is transmitted from the crank-shaft to the beater, whereby the durability of the parts, the ease of operation, and the strength and simplicity of the machine are greatly promoted; fourth, to simplify and improve the construction and connection of the parts composing the beater with relation to the beater-shaft and the machine cover or lid.

The machine consists in the several novel features of construction and new combinations of parts, hereinafter fully set forth, and definitely pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the top of the machine. Fig. 2 is a vertical section of Fig. 1 in the plane 1 1. Fig. 3 is a horizontal section of the machine in a plane a little below the cover or cap. Fig. 4 is a view, in perspective, of the rack-bar and plates. Fig. 5 is an elevation of the crank. Fig. 6 is a plan view of the beater. Fig. 7 is a view of one of the standards in section. Fig. 8 is a detail perspective of the thimble-bearing.

In the said drawings, the reference-numeral 1 designates the machine-body, usually constructed of wood, of any suitable dimensions and form, though I have usually built this part of rectangular shape, as illustrated. The body 1 may be supported on legs 2.

Upon the inner face of each of the four vertical walls inclosing the tank 3 is mounted a rib or strip, 4, extending diagonally across the same, and the relative arrangement of these ribs is such, preferably, that their highest and lowest extremities are adjacent to each other. In other words, the ribs upon any two intersecting walls of the tank will rise from the bottom of said tank, and their upper extremities will approximately intersect at the same angle common to the walls on which they are supported.

Upon the floor of the tank 3 is placed a central disk, 5, raised slightly above the level of said flooring, and having substantially a convex surface, whereby its central point, 6, is raised above the plane of the periphery of said disk. Extending from the central point, 6, in lines substantially radial to the surface of the disk, are ribs or strips, which may be either of the straight wedge-shaped variety or of the kind having a compound curve, as shown in Fig. 3 at 8. I may also use both forms, the one alternating with the other, as shown in the drawings.

The tank 3 is closed by a hinged lid or cover, 9, capable of being raised to give access to the interior of the tank. Upon this cover is mounted the operative mechanism whereby the machine is driven. Depending from the inner face of said lid or cover is the beater 10, composed of a disk, 11, of either wood or metal, and having a thimble, 12, which passes up through an opening in the cover or lid, and is prolonged to form the beater-shaft 13. This shaft is provided with a squared portion, 14, immediately above the cover, which receives the actuating-pinion 15, and the top or upper extremity of said shaft is received by a bearing, 16, formed in a standard, 17, a colter-pin, 18, being introduced therein to support the shaft. Upon the lower part of said standard is formed or mounted a cross-brace, 19, in which is formed a semicircular eye or loop, 20, which receives or forms a seat for the thimble 12 on the actuating-pinion 15.

Upon one side of the pinion 15 is placed a plate, 22, having a rail or rib, 23, upon which slides a rack-bar, 24, which meshes with the pinion. This rack-bar is provided with a longitudinal slot, 25, which not only receives the rail 23, but which also works upon two bosses,



26, projecting above the bar. A cover-plate, 27, is laid on the latter, said cover having a central slot, 28, through which the bosses 26 pass, and colter-pins 29 are inserted to hold the cover down.

Rising from one side of the rack-bar 24 is a bracket, 30, to which is bolted an upright, 31, having a central vertical slot, 32, in which works a head, 33. Journaled in this head is a crank-pin, 34, carried by the extremity of a crank-arm, 35. This arm is mounted upon and carried by a shaft, 36, journaled in standards 37, and by the revolution of the said shaft the rack-bar will be reciprocated, and reciprocating rotary motion will be imparted to the beater-shaft 13.

Upon the end of the shaft 36 is mounted a crank-arm, 38, the straight portion of which is provided with a groove, 39, and a longitudinal slot, 40. In the groove lies a straight lever-arm, 41, having an opening which receives a threaded bolt, 42, which passes through the slot 40, and receives a set-nut, 43, by which the lever-arm is fastened to the crank-arm at any point of adjustment. Upon the extremity of the lever arm is a crank-handle, 44, and a lever-handle, 45, the former being at right angles to and the latter in the same line with the lever-arm. It will be seen that the machine may be driven by either—that is to say, by the crank by a continuous rotation or by the vibration of the lever, either movement producing a reciprocating rotary movement of the beater.

By loosening the set-nut 43 the lever-arm 41 may be drawn out from or pushed in toward the crank-shaft 36, thereby enabling the operator to increase the power of the machine for handling heavy loads.

The vertical shaft 13 carries a beater, 10, which consists of a wooden or metallic disk, 11, having its point of connection with the shaft eccentric with said disk. Projecting from the lower face of the disk are the beater-arms 48, which are preferably ovoid in cross-section and are attached at or near the margin of the disk, thereby having rotation in different circles. As the beater revolves, the clothes are caught and whirled through the tank, being drawn over the ribbed convex disk on the bottom and against the diagonal ribs on the vertical walls. The action of the beater tends to draw the clothes toward the center of the tank, there subjecting them to a squeezing action, as well as the rubbing and rapid agitation in the water.

The beater-driving pinion 15 has a neck, 15<sup>a</sup>,

which sets in a thimble-bearing 49, Fig. 8, which passes down through the cover, as shown in Fig. 2, and is provided with lugs 49<sup>a</sup>, by which it is fastened in place. The collar on the pinion 15 lies in the bearing 20, Fig. 7, thus giving a firm support above and below.

Having thus described my invention, what I claim is—

1. In a washing-machine, a tank having a central convex disk on its bottom provided with radial ribs of the form specified, the vertical walls of the tank being provided with diagonally-inclined ribs of opposite inclination adjacently, substantially as described.

2. In a washing-machine, the combination, with a tank having a central convex radially-ribbed disk and provided with diagonally-inclined ribs upon its vertical walls, of a beater consisting of a disk carrying depending arms and a beater-shaft to which said disk is eccentrically connected, substantially as described.

3. In a washing-machine, the combination, with a beater and a vertical shaft carrying the same, of a standard having an eye at the top to receive the end of said shaft and provided with a lower cross-brace having an open or semicircular loop or bearing which receives the hub of the driving pinion, substantially as described.

4. The combination, with the cover 9, of the thimble-bearing 49, having lugs 49<sup>a</sup>, the cross-brace 19, having semicircular bearing 20, the pinion 15, having a neck, 15<sup>a</sup>, and provided with an axial opening, the shaft 13, arranged in said opening, means for supporting said shaft in position, and the rack-bar 24, substantially as described.

5. The combination, with the cover 9, of the thimble-bearing 49, having lugs 49<sup>a</sup>, the cross-brace 19, having semicircular bearing 20, and provided with uprights 17, connected by cross-piece 16, the pinion 15, having neck 15<sup>a</sup> below and a short hub above, the same having an axial opening, the shaft 13, arranged in said opening and having its end lying in a bearing in the cross-piece 16, pin 18, the rack-bar 24, having a slotted upright, 31, the crank-head 33, lying in the slot of said upright, the crank 35, and shaft 36, substantially as described.

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

JOSEPH C. CROPPER.

Witnesses:

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H. B. CROPPER.