

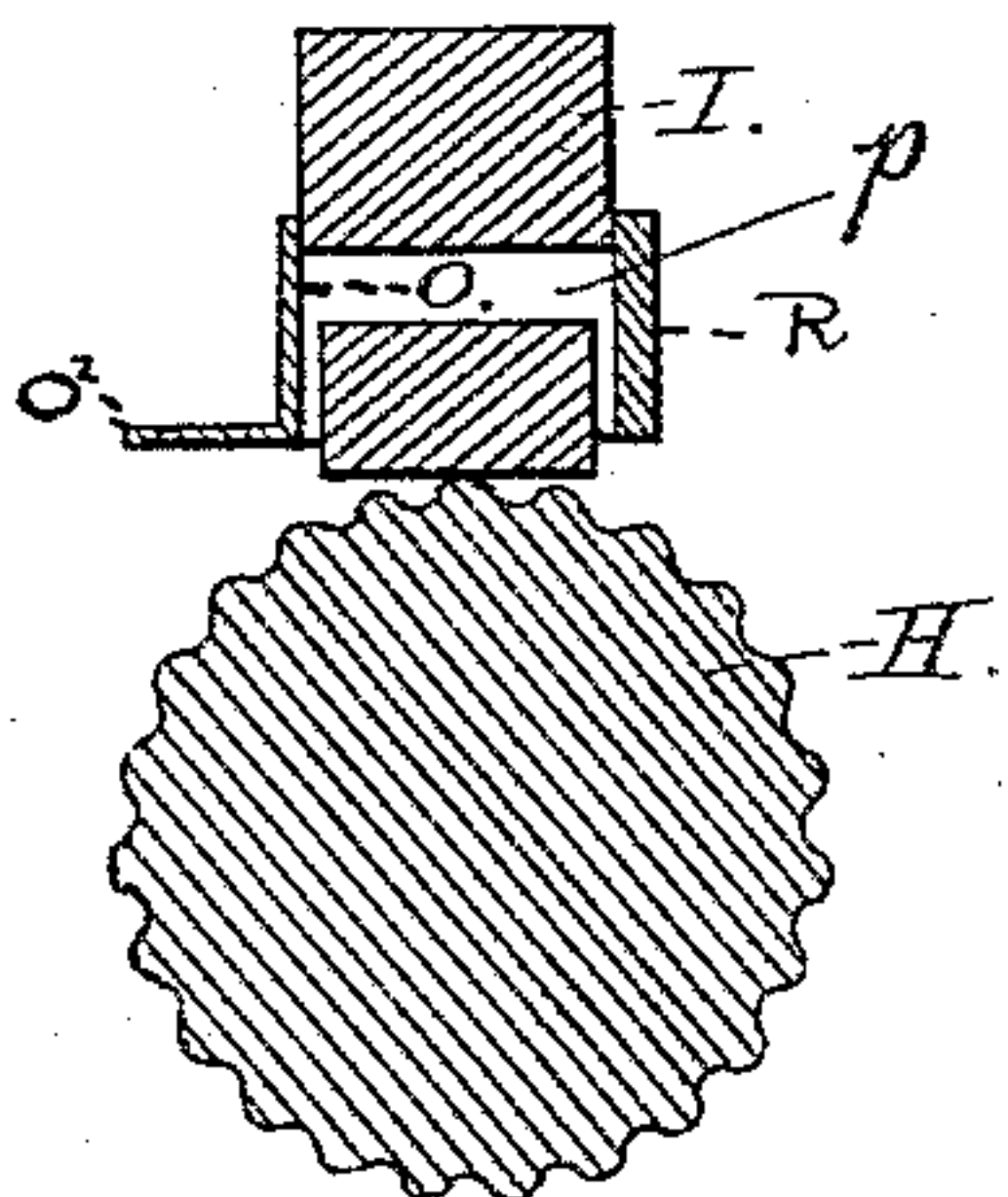
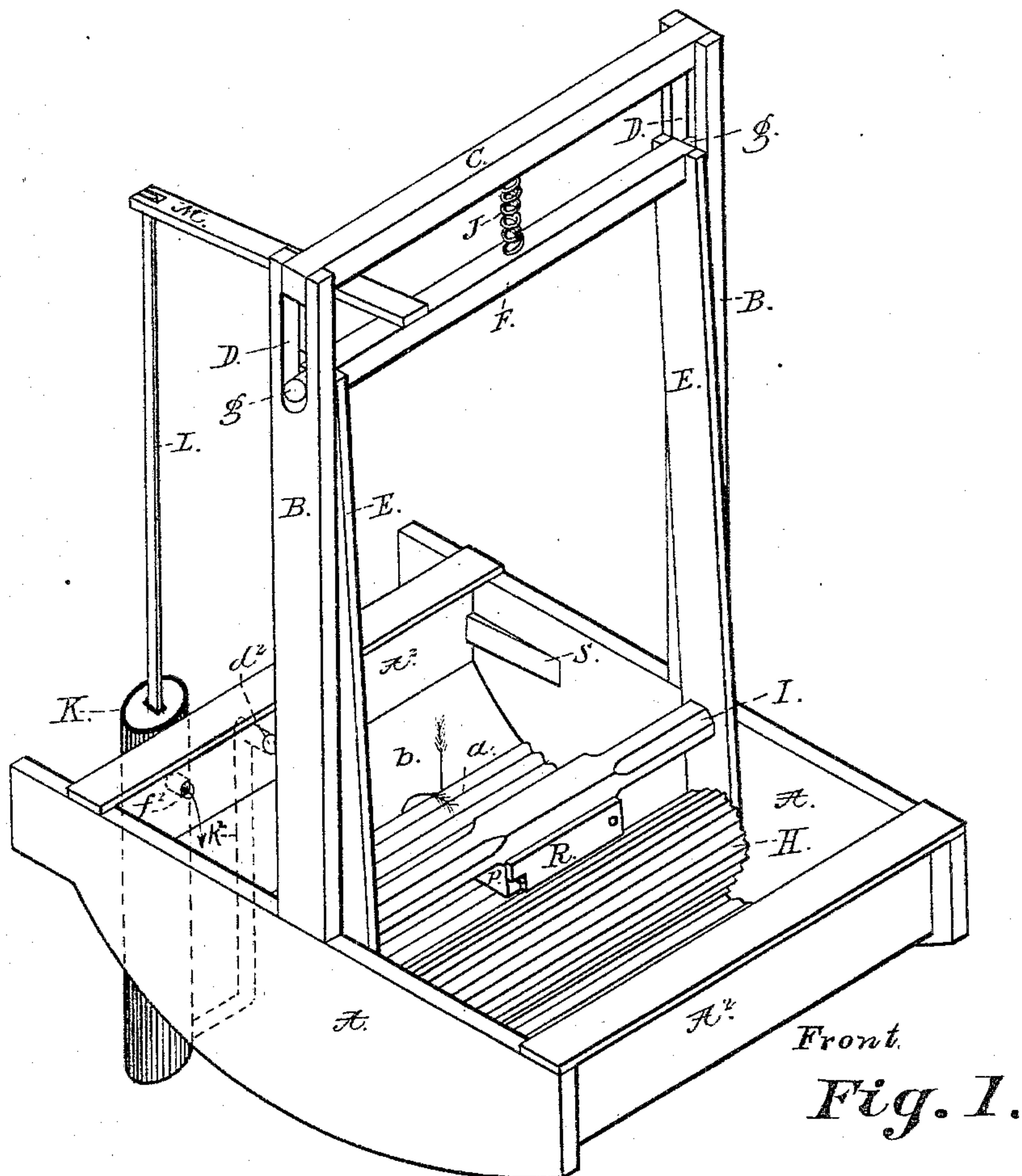
(No Model.)

2 Sheets—Sheet 1.

F. D. HARDING.
WASHING MACHINE.

No. 411,658.

Patented Sept. 24, 1889.



Witnesses:

John F. Barrett

Herbert G. Briggs

Fig. 2.

Inventor:

Frederic D Harding

(No Model.)

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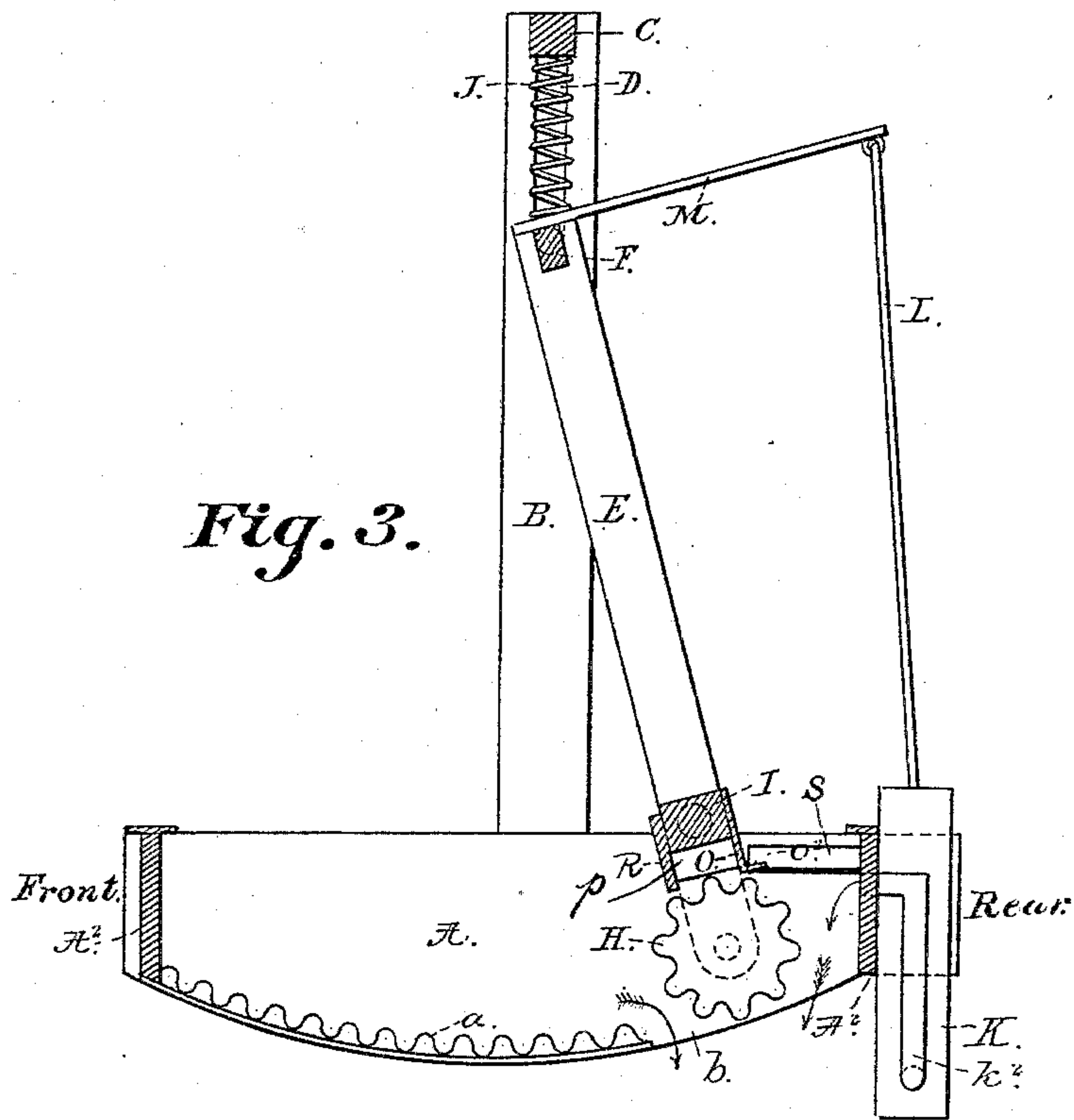
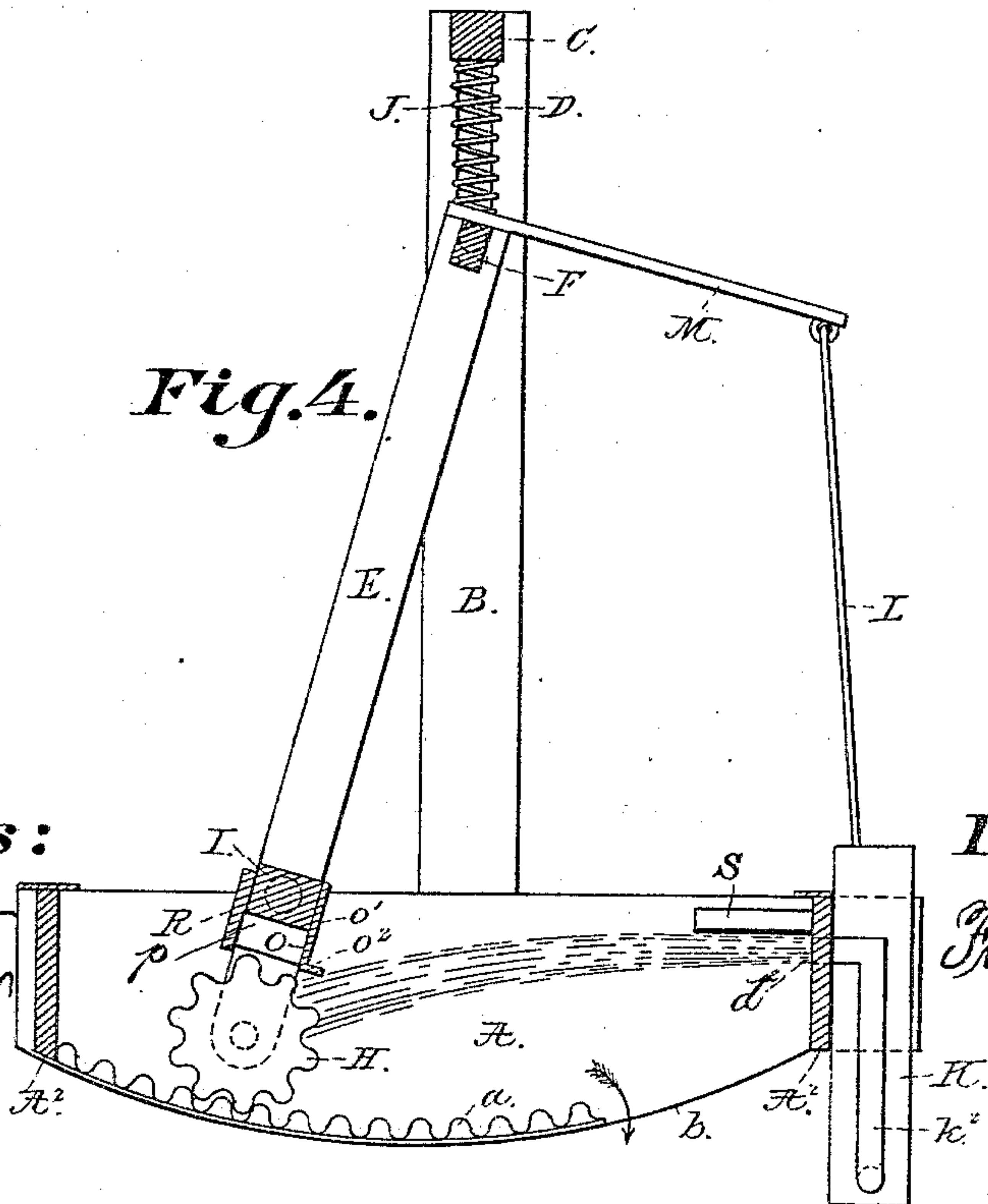


Fig. 4.



Witnesses:

John F. Barrett
Robert G. Riggs

Inventor.

F. D. Harding

UNITED STATES PATENT OFFICE.

FRED. D. HARDING, OF BALDWIN, MAINE.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 411,658, dated September 24, 1889.

Application filed February 16, 1888. Serial No. 264,237. (No model.) Patented in Canada July 19, 1888, No. 29,507.

To all whom it may concern:

Be it known that I, FRED. D. HARDING, residing at Baldwin, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Washing-Machines, (for which I have received Letters Patent in Canada, No. 29,507, dated July 19, 1888;) and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

In the accompanying drawings, Figure 1 shows an isometric view of a washing-machine equipped with my newly-devised improvements. Fig. 2 is a detail in cross-section of a washing-roll and soap-holding box. Fig. 3 shows a vertical longitudinal section wherein the washing-roll is pushed to the back side of the machine, showing the best disposition of the parts when the fabric is to be laid upon the wash-board. Fig. 4 is also a vertical longitudinal section, wherein the washing-roll is drawn to the front of the machine.

In the several figures of the drawings the same reference-letters point out the same parts.

The objects and purposes of my invention will be hereinafter more specifically described, while such arrangements, combinations, and constructions of mechanical parts as are believed to be new will be pointed out in the subjoined claims.

Referring to the drawings, A A show the side rails of a casing or frame-work for supporting the working and operative parts of a washing-machine. The side walls A A are straight on their top edges and curved on their bottom edges. They are joined together by end rails A² A². The top of the casing or frame-work, when the rails A and A² are united, represents a rectangle, which may be of any desired dimensions. The casing is open at the top. The bottom *a* is made of zinc sheets wrinkled or corrugated, similar to the front surface of an ordinary wash-board. The zinc bottom *a* extends from the front rail nearly to the back rail, leaving a narrow opening *b*, which extends the whole width of the bottom.

The object of constructing the bottom with

the transverse opening *b*, as above indicated, will be hereinafter shown in connection with the description of the uses and operation of a certain part of the mechanism called the "oscillating frame."

In use the casing is designed to set over the top of an ordinary wash-tub or other convenient receptacle for holding water.

Rising perpendicularly from the top edges of the side rails at or near their central points are seen standards B. The tops of the perpendicular standards are firmly united by means of a cross-bar C, which is fastened in any suitable and convenient manner within longitudinal slots or bifurcations D, with which the ends of the standards are provided. Between the standards B is placed what I have denominated the "oscillating frame," because it vibrates backward and forward between the bifurcated standards B. The oscillating or swinging frame is composed, principally, of two parallel bars E, united at their tops by a cross-bar F, the ends of which project somewhat beyond the sides of the bars E and act as journals.

g are the journals, which are represented as finding proper bearings in the lower end of the longitudinal slots D in the tops of standards B. Near their lower ends the bars E are joined together and braced by a cross-bar I, which serves as a convenient handle to be grasped by the operator when oscillating the frame backward and forward. The oscillating frame is designed to carry a corrugated washing-roll or rubber.

H represents such a roll journaled in the lower ends of the bars E.

J is a spiral spring compressed between the under side of the cross-bar C and the top of the cross-bar F. The spring J is for the specific purpose of governing the pressure of the roll or rubber H upon the curved bottom *a* when the oscillating frame is in vibration.

K shows a pump attached to the rear rail of the casing. The top of the pump-cylinder rises a little above the top of the rear rail. The bottom projects downwardly beyond the lower edge of the rail. Near its bottom the periphery of the pump-cylinder is perforated and provided with a side pipe *k*², which extends upwardly and registers with or extends through an opening *d*² in the rear rail.

f^2 is a supplemental pipe extending from the barrel of the pump through the rail.

The office of the pump is to feed a supply of water, in the manner to be hereinafter described, over the floor a in unison with the forward movement of the oscillating frame. To achieve this result, a piston-rod L extends upward from the pump and connects with the end of an arm M , which projects horizontally and at right angles from the cross-bar F . Thus when the oscillating frame is vibrated backward the outer end of the arm M rises to correspond with the movements of the vibrating frame, as in Fig. 3, and in like manner when the frame is moved forward the arm M falls, as in Fig. 4, and consequently the piston rises and falls in the barrel of the pump, and as it falls forces water up the side pipe k^2 through the opening d^2 upon the roll or rubber H , and thence over the floor a . As the opening d^2 is placed at about the center of the rail A the stream of water intermittently ejected from or through it passes over the open space b between the end of the floor a and the rail, and comes in the quantity required upon the roll when it reaches or nearly reaches the front rail A^2 . This flow of water is in the form of a single jet or spurt, (not a continuous flow,) and is only of sufficient volume to supply exactly the required quantity for the cleaning and washing operation. It is not meant that the jet or spurt of water shall always hit the roll when it reaches the front rail or near there, but that it shall practically afford only a sufficient supply of water just in front of the roll when it has reached or about reached its forward movement and is ready or about ready to be started in the opposite direction, and which supply stops with this forward motion. By this operation there is automatically supplied the proper quantity of water in the process of washing exactly at the right time, and just as one washing with the old hand-board would obtain it by dipping the hand or clothes down into the tub. Unless proper means are taken to prevent it, practice has shown that a certain part of the water during the operation of pumping will pass above the plunger affixed to the lower end of the piston L , and will as the plunger operates be thrown, through the hole in the top of the pump-cylinder in which the piston moves, high in the air and wasted. To obviate this difficulty, an opening f^2 is made in the rear rail, registering with a like opening in the pump-cylinder, in which a pipe or tube may or not be inserted. By this means the water rising above the plunger escapes through the opening f^2 , and falls through the opening b into the receptacle beneath.

In order that the roll may be automatically held, when it is so desired, at the rear of the machine, there are provided wedge-shaped pieces S , longitudinally at the inside of the side rails at the rear and near the top. Upon these the sides of the bars E will impinge and

bind sufficiently to hold them till the hand is placed on the frame to move it forward. When thus held at the rear and away from the end of the floor a , the space b is sufficiently uncovered to enable the operator to reach down through said opening and take hold of the garment in the water in the tub below, whence it can be readily drawn upon the floor and prepared for the forward movement of the roll over it. The tension of the spring J is such that the roll will be brought sufficiently well in contact with the surface of the floor a to answer all needful purposes of washing and will not abrade or wear the garment, except in the very slightest manner, so that the least possible wear or damage is done to the article washed.

The operation of the device is very simple. It is placed over any convenient water-holding receptacle, with the bottom of the pump K immersed in the water. The oscillating frame is then pushed rearward, as shown in Fig. 3, till the roll H passes beyond the rear edge of the floor a . The thrust of the spring J then forces the journals g to the bottom of the bifurcations D and drops the roll H , journaled in the foot of the oscillating frame, into the open space b , beyond the rear edge of the floor. The operator then suitably spreads the garment to be washed upon the floor. Then by means of the handle I the oscillating frame is drawn toward the front rail, the roll H meets the rear edge of the floor, rides up, lifts the journals g in the bifurcations D , and compresses the spring J , no other force being needed to raise the frame than is exercised by the mere act of drawing the frame forward. The roll is then continuously and quickly drawn forward till it fully or nearly reaches the front rail. Thus the jet of water from the pump as it then strikes under the fender O , as will be explained, is caused to impinge or dash upon it at this point, and is diffused, sprayed, or distributed evenly over the garment spread on the floor. This gush or jet of water gives only a small quantity, but it is just the amount needed to suitably moisten or wet the garment all over the floor. Then the roll is moved freely back and forth over the floor within such space on the floor as shall not cause the piston-rod to actuate the pump—that is, eject water—but when any more water is needed a quick movement of the roll to or nearly to the front rail will cause a jet to be again dashed upon the garment in the manner just described, so that the washing operation can be perfectly carried on and as much or as little water as may be desired to automatically force on the garment being washed and at precisely the moment needed. Thus the roll as the frame vibrates rubs over the spread-out garment, and under the direct pressure of the spring scrubs and cleans it, similar to the action of hand-work in rubbing a garment over the surface of an ordinary wash-board.

As before stated, the pump K , by means of

its connection, works in unison with the oscillating frame, and while the frame is in vibration an intermittent jet or stream of water will be pumped through the opening d^2 over the garment. The pumping effort in all cases should be just sufficient to force and keep the water jet or stream in direct contact with the roller H as it reaches or nearly reaches the front rail, as has been described.

To prevent the water from splattering upward and wetting the operator, a protecting-fender O, having a projecting flange, is attached to the handle I directly over the point where the water strikes the roll. When it is desired to remove the garment, the pressure is relieved by pushing the frame into the opening b to the position shown in Fig. 3, when the garment is entirely exposed and can be readily taken hold of and lifted out.

As a convenient means for automatically supplying soap, the following construction is adopted: On the under side of the handle I end pieces p p are set, butting on one side against the fender O and on the other against a pivoted side piece R, the whole construction making a rectangular box open at the bottom. The bottom of the box is just above the roll H, so that a bar of soap placed in it bears directly upon the roll. Thus when the roll is rotating the surface of the soap tangent to the roll is gradually eaten or worn away.

The spring that imparts pressure to the roll H and allows it to yield to the varying thickness of clothing also serves to press the roll into the opening b and hold it there when the roll is moved to the rear of the machine for the purpose of putting in or taking out the clothes.

The supplemental port f^2 , allowing free action of the pump without wasting the water, is of great advantage.

The fender O is very efficient for keeping the operator from being drenched by the splashing of the water as it strikes against the roll H.

What I claim as my invention, and desire to secure to myself by Letters Patent, is—

1. In a washing-machine, as described, a floor cut away at the rear, a pumping device placed centrally at the rear, and a swinging

rubber-roll and its carrying-frame and an arm connecting said frame and pump, all constructed and combined in the manner described, whereby the pump is adapted to deliver a jet of water upon the roll when the roll has been moved to the front rail.

2. In a washing-machine, the combination of the following elements, viz: a swinging frame carrying the washing-roll, a pump centrally located and operated by the movements of said frame to deliver a jet of water at the forward movements of the roll, and a guard over the roll to prevent the upward splattering of the water.

3. In a washing-machine, as described, the combination of the roll and its swinging frame with the floor cut away at the rear and the side wedges or inclines near the top of the side walls and at the rear, whereby the roll-frame may be held at the rear and away from the floor, in the manner and for the purposes set forth.

4. In a washing-machine, as described, the casing provided with perpendicular standards B, the swinging frame E, journaled at its upper end in slotted bearings in said standards, the spring J, the washing-roll H, the corrugated bottom, and the centrally-located pump K, automatically operated by said frame and delivering water in jets upon the roll in the manner set forth.

5. The combination of the roll H, mounted and operated as set forth, the floor a , cut away at the rear and having an opening b between it and the rear part A^2 of the casing, and the pump K, centrally located and operated by the swinging frame, and the guard O over the roll, substantially as described.

6. The combination of the roll H, swinging frame E, spring J, the arm F, attached to the frame and carrying the piston-rod L, the centrally-located pump K, and floor a , cut away, as described, in the manner and for the purpose set forth.

In testimony that I claim the foregoing as my own I have affixed my signature in the presence of two witnesses.

FRED. D. HARDING.

Witnesses:

JOHN F. BARRETT,
H. G. BRIGGS.