(No Model.)

H. M. HARDGROVE.

WASHING MACHINE.

No. 354,134. Patented Dec. 14, 1886.

Fig. 2.

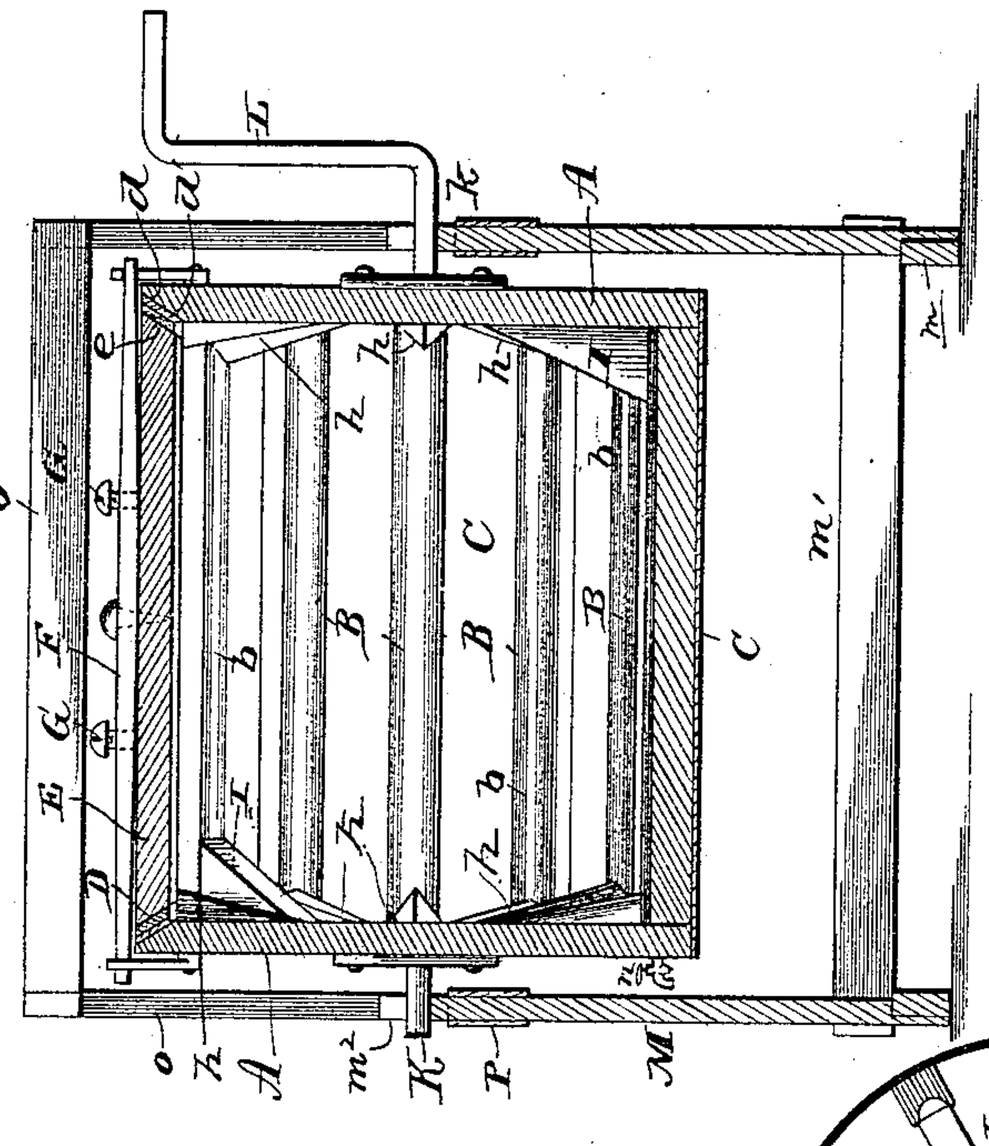


Fig. 3.

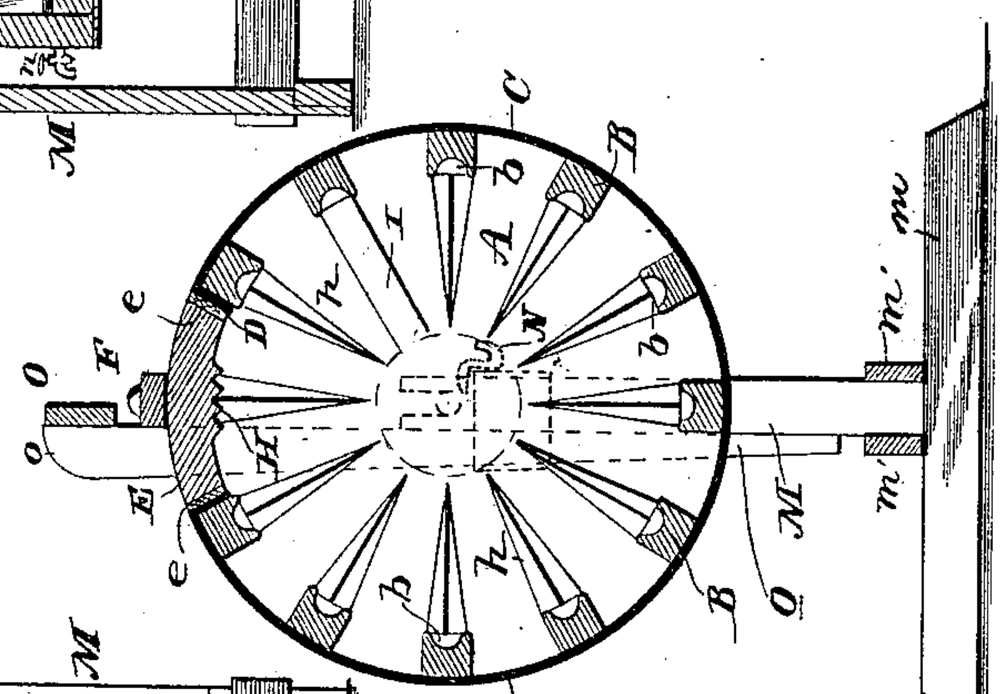
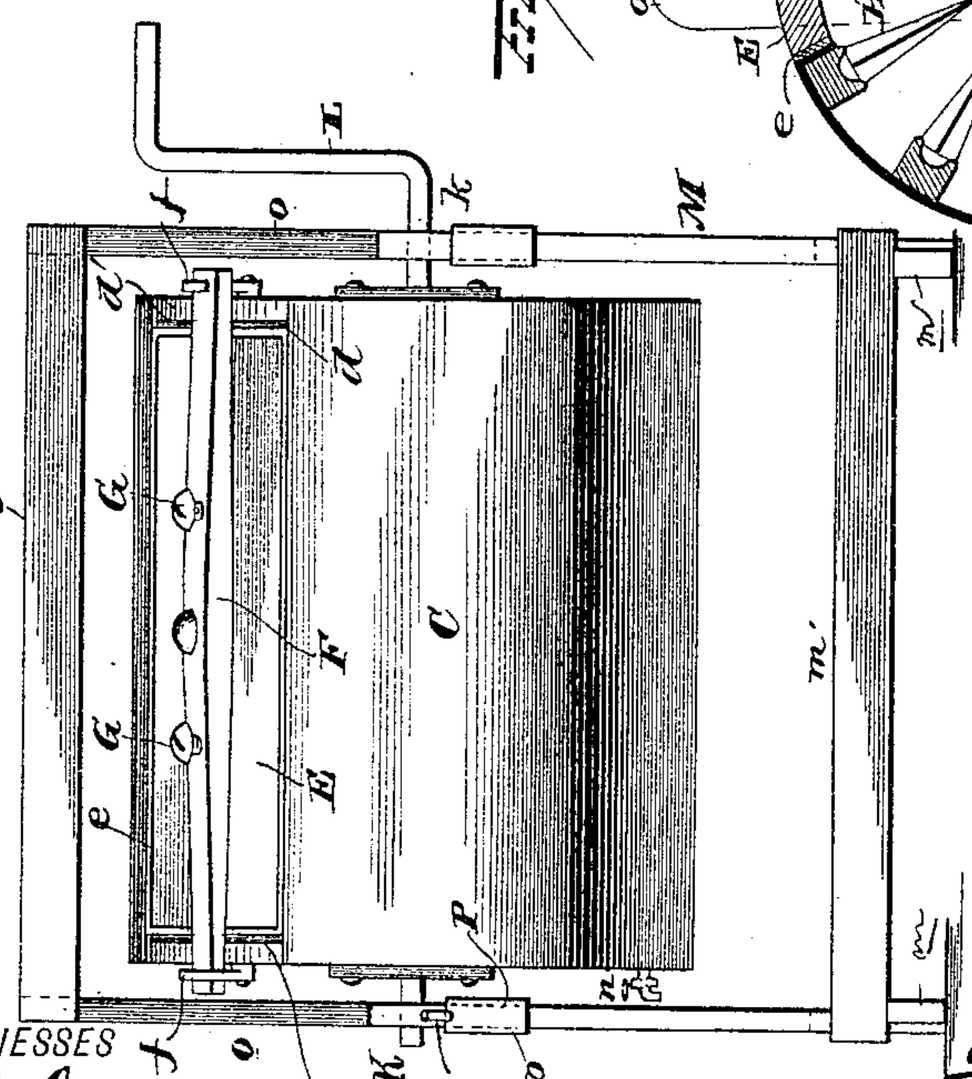


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY M. HARDGROVE, OF FOND DU LAC, WISCONSIN.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 354,134, dated December 14, 1886.

Application filed April 29, 1886. Serial No. 200,529. (No model.)

To all whom it may concern:

Be it known that I, HENRY M. HARDGROVE, of Fond du Lac, in the county of Fond du Lac and State of Wisconsin, have invented certain new and useful Improvements in Washing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in washing-machines.

The object is to provide a machine which will thoroughly wash a great or small quantity of clothes without seriously chafing or damaging them, and which may be manufactured at a small cost.

A further object is to provide a washing-machine which may be operated by a small outlay of strength, and which shall be durable.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view of the machine in side elevation. Fig. 2 is a longitudinal section, and Fig. 3 is a transverse section.

A skeleton frame consisting of a pair of solid circular ends, A, having their peripheries connected by a series of bars, B, is covered by a sheet of zinc, C, or other suitable non-rusting material, flush with the outer edges of the ends, forming a water-tight cylinder, with the exception of an open space, D, extending, preferably, the entire length of the cylinder, to enable the clothes to be put in and taken out with ease. The bars B are located at regular intervals apart, and the open space D is the distance between one of the bars B and the second bar therefrom. The zinc or other covering is bent down over the edge of each of the bars at the edge of the opening D, forming a smooth and durable bearing for the sides of the door, and offering no obstruction to the passage of the clothes in and out. The ends *d* of the opening D are beveled, as shown, and faced with a flexible packing, *d'*, to render the joint water-proof.

E represents the door. It is provided with beveled sides and ends, adapted to fit snugly against the edges of the opening, and is provided on its beveled sides and ends with rubber or other suitable packing, *e*, to insure a water-tight joint.

A fastening-bar, F, is pivotally secured at its middle portion to the central portion of the door on its outer side, and the ends of the said bar project over the ends A of the cylinder, and are locked by a pair of hooks, *f*, one on each end A, which are adapted to be swung into engagement with the ends of the bar. A pair of set-screws, G, are adapted to work in perforations in the bar F at about equal distances from the ends of the door, and bear against the surface of the door or against suitable bearing-plates set therein. By turning down the screws G, after the bar F is secured by the hooks, the door E is forced home and a tight joint secured.

The inner faces of the bars B are provided with one or more longitudinal grooves, *b*, preferably one quite deep groove, as shown, and the inner face of the door E is provided with a series of longitudinal V-shaped ridges or beads, H.

The inner faces of the ends A are provided with V-shaped ridges *h*, radiating from or from near the centers of the ends to the faces of the bars B, and gradually increasing in height as they approach the bars. In the place of two of the ridges *h*—one at each end and extending in opposite directions from the axis of the cylinder—are secured wings I, which gradually increase in height from a point or edge at or near the center to a foot (more or less) at the bars B.

The cylinder is provided with a journal, K, at one end, and with a journal, *k*, terminating in a crank, L, at the opposite end, by means of which it is suspended in a frame, M, and has a free rotary motion in its bearings.

The frame M consists, preferably, of a pair of upright standards secured to base cross-bars, *m*, and connected by a pair of girders, *m'*. In the upper ends of the standards M are open slots m^2, in which the journals K *k* are adapted to rest, and from which they may be readily removed.

One of the standards M is provided near its upper end and on one side, below the bearing of the journal K, with a hook or journal bear-

ing, N, into which the journal K may be placed when it is desired to draw the water from the tub or cylinder through the faucet *n*.

A frame, O, for the support of the wringer and for securing the standards M against spreading, consists of a pair of standards adapted to slide down in sockets *p*, formed by bands P, secured around the standards M, and a cross bar or girder, *o*, connecting the upper ends of the standards O above the tube or cylinder.

The operation is as follows: The clothes having been placed in the tub or cylinder with the proper amount of water and soap, and the door closed water-tight, the cylinder is revolved by means of the crank L. The clothes will occupy the portion of the cylinder which is lowest, and the action of the fluted bars B and ridges on the ends will rub the dirt out of the clothes. The wings I form an important feature of the interior, since they serve to keep the clothes constantly rolling over, thus bringing every portion of them into contact with the rubbing-surfaces.

The machine may be constructed of any size desired, and may be made more or less expensive, according to the material and finish. It consists of few parts, and does its work rapidly and well, while very little power is required to operate it.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the construction herein set forth; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a washing-machine, the combination, with a cylindrical rotary tub provided with a series of longitudinal hollow-faced ribs or bars and a series of radial bars at each end, of a pair of wings located one on each end and extending in opposite directions from the axis of the cylinder, adapted to engage the clothes as the cylindrical tub revolves and roll them over, substantially as set forth.

2 In a washing-machine, the combination, with the frame adapted to support the rotary tub or cylinder, of the wringer-supporting frame adapted to slide into slots formed by bands around the standards of the main frame and prevent said standards from spreading, substantially as set forth.

3. The washing-machine consisting, essentially, of the main supporting-frame, the wringer-frame, forming a part of the main frame and removably secured thereto, the rest for the tub-journal secured to the side of one of the main standards, the rotary tub or cylinder with its interior arrangements, substantially as described, and the door and door-fastenings, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HENRY M. HARDGROVE.

Witnesses:
ANTHONY KELLY,
HENRY SHAFER.