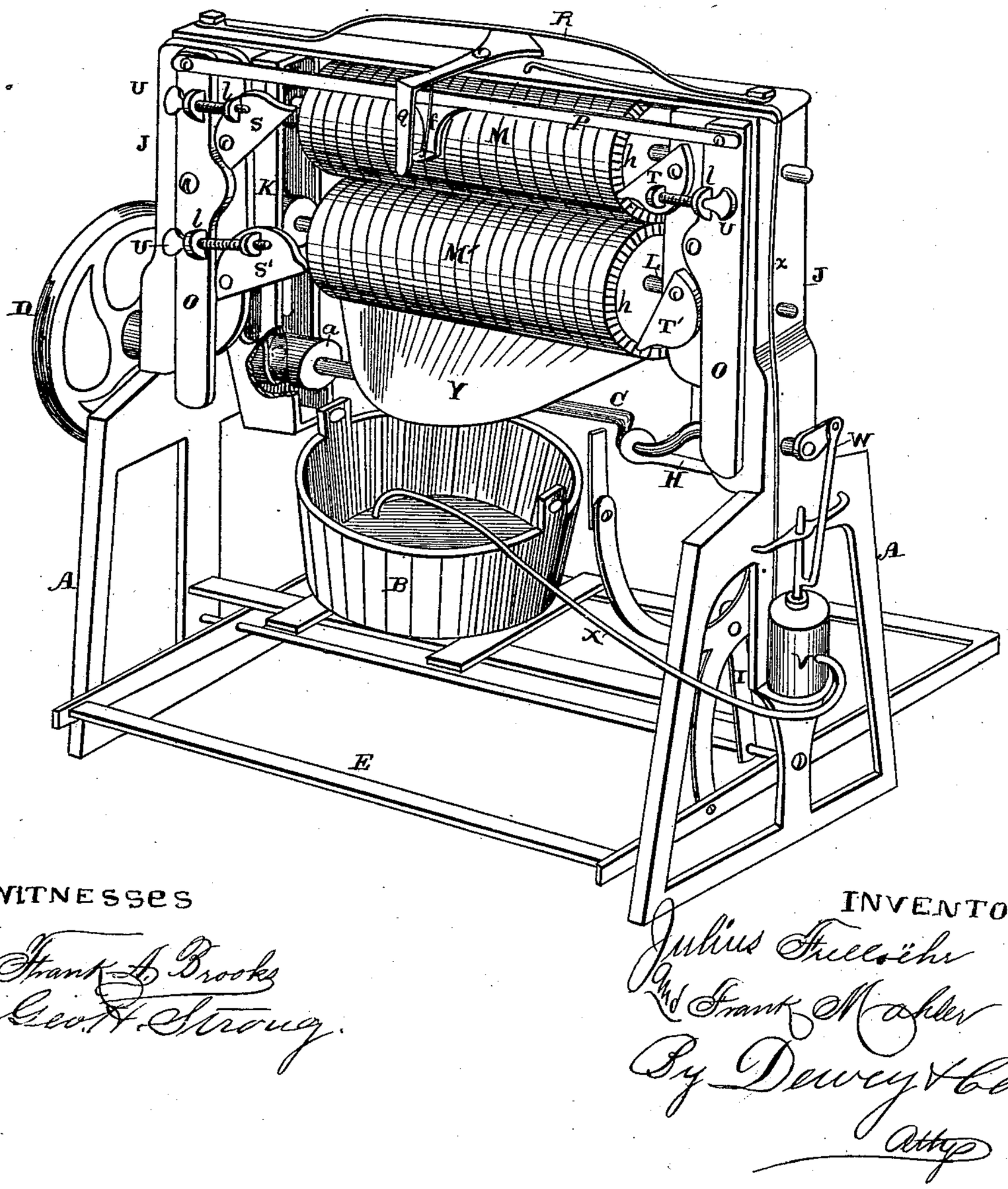
2 Sheets—Sheet 1.

J. FRELLOÉHR & F. MAHLER.

Washing-Machine.

No. 226,909. **Patented April 27, 1880.**

Fig. 1



WITNESSES

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2 Sheets—Sheet 2.

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Fig. 2.

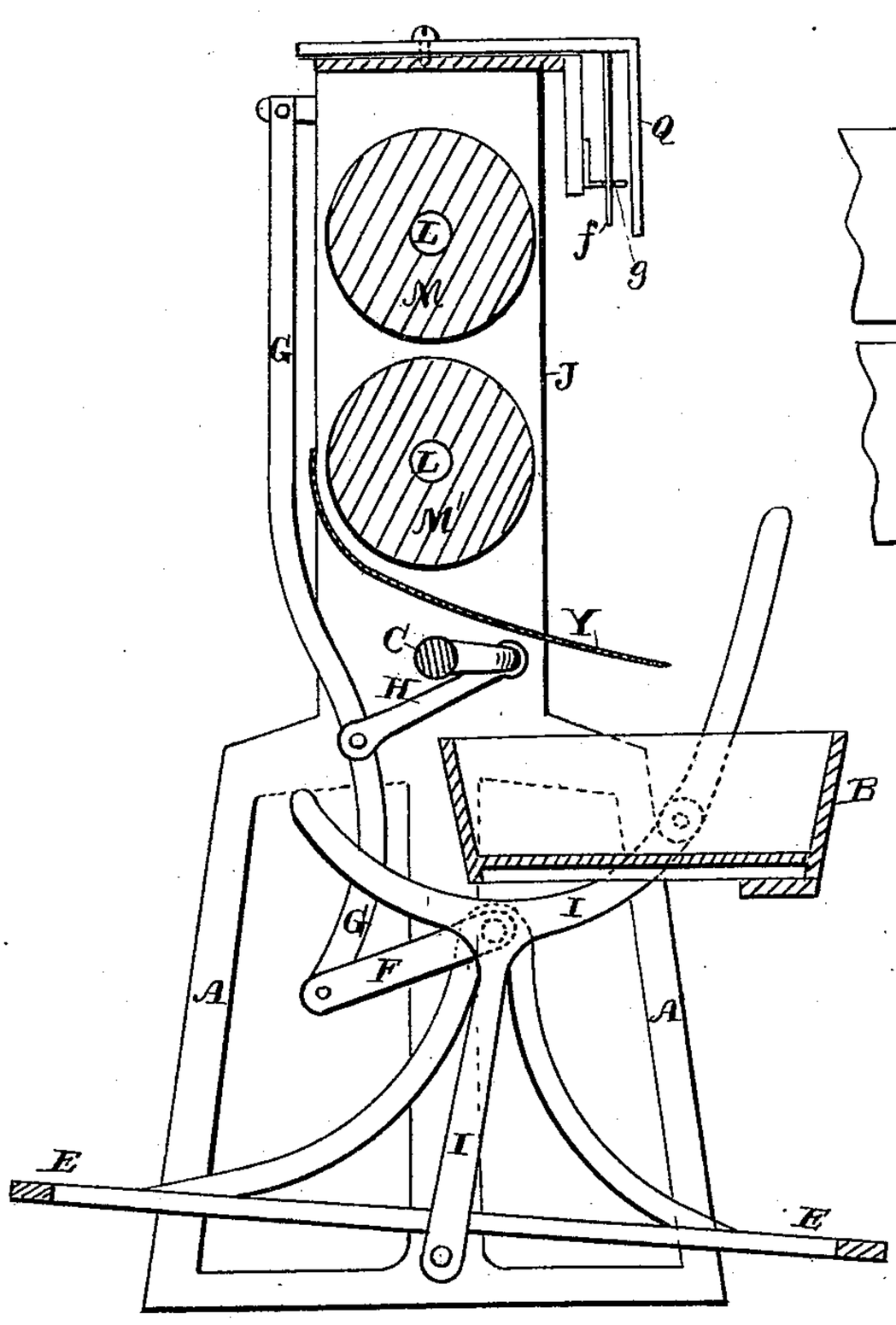


Fig. 3.

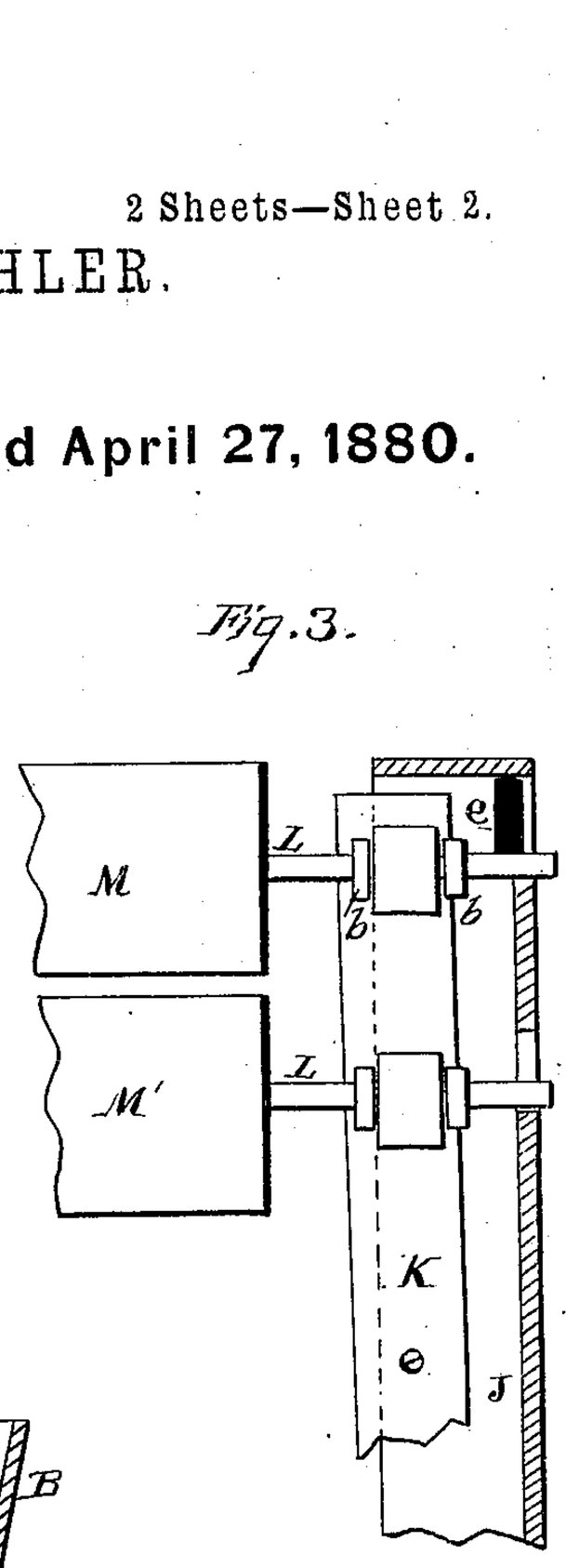
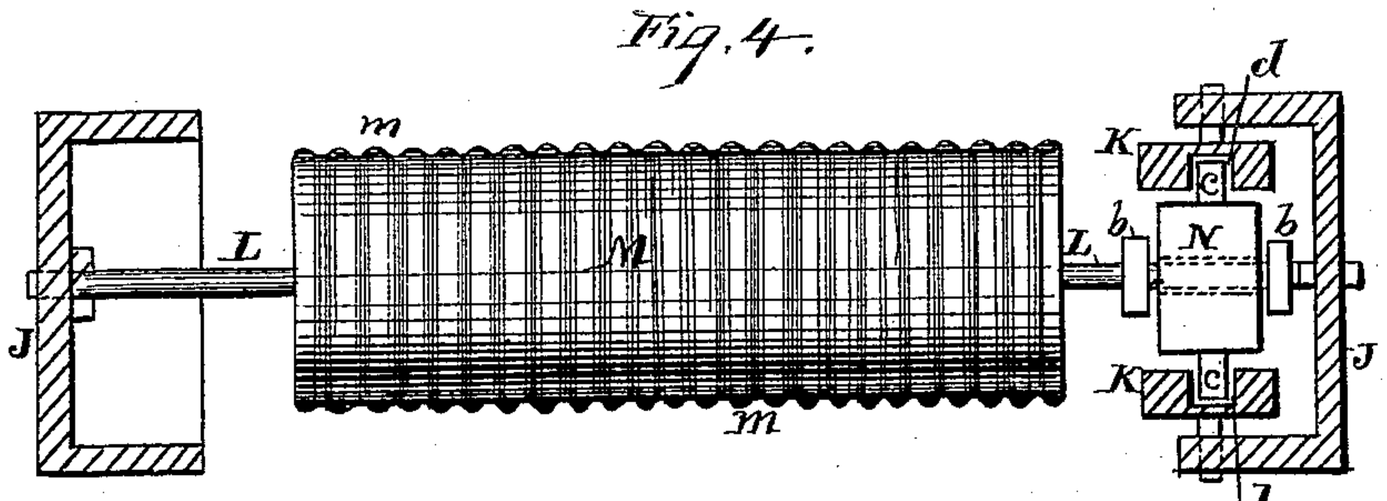


Fig. 4.



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UNITED STATES PATENT OFFICE.

JULIUS FRELLOËHR AND FRANZ MAHLER, OF SAN FRANCISCO, CAL.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 226,909, dated April 27, 1880.

Application filed December 4, 1879.

To all whom it may concern:

Be it known that we, JULIUS FRELLOËHR and FRANZ MAHLER, of the city and county of San Francisco, and State of California, have invented an Improved Washing-Machine; and we hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to certain improvements in that class of washing-machines in which the clothes to be cleaned are passed between rollers; and our improvements consist in providing a pair of circumferentially grooved or corrugated rollers which are given both a rotary and endwise-reciprocating rubbing motion by peculiar mechanism operated by a foot-treadle, in combination with peculiar dogs or lugs provided with a swinging arm, by means of which the direction of rotation of the rollers is controlled, the dogs or lugs being provided with adjustable bolts, by which the feed of the rollers is regulated. The rubbing action of the rollers is such that the clothes are washed in a manner similar to the operation when performed by hand, while at the same time no injury is done to them, the rollers being mounted on elastic bearings, as is more fully described in the accompanying drawings, in which—

Figure 1 is a perspective view of our machine. Fig. 2 is a transverse vertical section. Fig. 3 is a vertical section through the standard. Fig. 4 is a longitudinal horizontal section.

Let A represent the bed and frame of the device, suitably constructed to carry the tub or tank B and the crank-shaft C, with its fly-wheel D.

The double treadle E has a bifurcated arm on one side, to the upper end of which is pivoted the lever F, this being in turn pivoted to the lower end of the lever G, said lever being also pivoted to the upper part of the frame. At a suitable position on this lever G is hinged the connecting-rod H, which operates the crank-shaft, as shown, said crank-shaft being thus rotated by a compound lever formed of the connecting-rod F and lever G and rod H. This is a balance-treadle, and may be operated from one side only or both, as desired.

Secured to the upper end of the bifurcated arm of the treadle E is another bifurcated arm, I, pivoted below, the arms extending up on each side of the frame, as shown.

The object of this construction is that we may be enabled to work the operating-levers and crank-shaft by hand as well as by treadle power when desired.

The pivot of the lower bifurcated arm may be removed and only the hand-lever used, if required; but ordinarily either foot or hand power may be used without disturbing any of the parts.

The hand-lever can be worked from one side only, or both sides, as is most convenient.

In one of the standards J on the upper part of the frame is a centrally-pivoted rocking or vibrating arm, K, to which motion is imparted by the cam *a* on the crank-shaft. This arm will reciprocate the rollers M M′, as herein described, no matter in which direction the crank-shaft is rotated.

The shafts L, carrying the rollers M M′, are each provided with two collars, *b*. Between these collars the shafts pass through blocks N, provided with lugs or trunnions *c*. These lugs or trunnions fit in the slots *d* in the sides of the rocking arm K. One of the shafts L is above and one below the central pivot of the rocking arm. As the arm K is rocked back and forth by the cam on the crank-shaft an alternating reciprocating motion is imparted to the rollers, as well as a rotary one, as hereinafter described.

The arrangement of the collars, blocks, and lugs on the roller-shafts and rocking arm is such as to allow the shafts L a reciprocating motion in their bearings, one roller moving in one direction while the other moves in the opposite. By this means a transverse rubbing motion is given to any articles between the rollers, which will effectually cleanse them.

By setting the hand-lever Q, controlling the connecting-rod P and bars O, with their pawls in the center, all the pawls are thrown out of gear. The rollers will then reciprocate only, and not feed, thus rubbing any particular part of the clothes desired more thoroughly.

Above each end of the shaft L, carrying the upper roller, is an elastic strip or spring, *e*, the object of which is to cause an elastic press-

ure of the upper roller on the lower, so that greater or less thickness of clothes may pass between the rollers and a constant pressure be maintained. There will be, moreover, no danger of injuring the clothes by passing them between the rollers when one is thus placed in elastic bearings.

On one side of each standard is a centrally-pivoted bar, O, these two bars being connected at their upper ends by means of a rod, P.

Pivoted on the upper cross-bar of the frame is a right-angled lever or movable hand-rod, Q. On the inner side of this lever Q is a spring-rod, *f*, which fits in an eye, *g*, in the center of the connecting-rod P. A spring, R, across the top of the frame bears against the grooved head of the lever Q, and by its tension holds said lever Q in any position it may be put.

Swiveled or pivoted on the sides of the standards near the pivoted bars O are cam-shaped pawls S S′ T T′, by means of which the rotary motion is imparted to the rubbing-rollers, and by which said rollers are rotated in either direction.

The rubbing-rollers are provided on their ends with ratchets *h*, with which the pawls S S′ T T′ engage. As the bars O are swung over by the rod P the lower pawl, S′, and upper pawl, T, are dropped forward to engage with the ratchets on their respective rollers, so that as the rollers, by their reciprocating motion, are brought in contact with said pawls they are rotated by the pawls coming in contact with the ratchets. In this way one roller is rotated in one way and the other in the other, the pawl S′ moving the lower roller upward and the pawl T moving the upper one downward. This action of the rollers draws the clothes out of and away from the tub.

When it is desired to give the clothes a stronger rubbing, or when two tubs are used and the clothes are drawn from one to the other and back again, the rotary motion of the rollers may be reversed.

The direction of the crank-shaft is immaterial, the remainder of the mechanism operating the same in either case.

By throwing over the movable hand-rod Q its spring-rod *f*, fitting in the eye *g*, moves the connecting-rod P, which swings both the pivoted bars O and brings the other pawls, S and T′, forward, so they will engage with the rollers, the other pawls, S′ T, being drawn back out of contact with the ratchets. Then the pawl S will move the upper rollers upward, and the pawl T′ will move the lower downward, so the rollers will move in opposite directions.

On suitable lugs *l* on the pawls and bars O are adjusting screw-rods U, having nuts, which may be screwed back and forth, so as to drop the pawls more or less toward the ratchets of the rollers. By means of these adjusting-rods the feed of the rollers may be regulated, the pawl being allowed by them to have more or less motion. When the pawls drop forward considerably they will turn the rollers more at each reciprocating motion than they will when the screw-rods do not allow them to fall so far forward.

On one side of the frame is a small force-pump, V, the plunger of which is suitably connected with the crank W on the crank-shaft. A water-pipe, X, leads from the tub or tank to this pump, and the water drawn from the tank by the pump is forced through the continuation of this pipe to the upper roller, as shown, where a continual stream will be delivered to the rollers and mingle with the clothes passing between them. Suitable drip-pans Y direct the water back into the tubs again.

The corrugations *m* on the rollers are in line with the rotation of the said rollers, so that as the rollers are reciprocated the clothes between them are rubbed by the corrugations going back and forth over them, as knuckles would do in washing by hand. During the operation a stream of water is pouring over the clothes, and they are kept saturated, as they would be in being rubbed on a wash-board and dipped in and out of the water.

The elastic bearings of the rollers prevent the clothes being torn or in any way injured, and they require no handling after once being put in the tub and started through the rollers.

The machine may be operated, if desired, by two persons working on opposite sides of the treadle, the crank-shaft moved by the compound levers connected with the treadle rotating, feeding, and reciprocating the rollers and pumping up the water, as described.

This machine is simple in operation and very effective, performing its office very much in the manner as if the clothes were washed and scrubbed by hand.

It will be evident the machine may be operated by steam-power, if desired, by suitable connection with the fly-wheel and crank-shaft.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The rotating rollers M M′, with their vertical corrugations *m*, shafts L, elastic shaft-bearings *e*, and collars *b b*, in combination with the vibrating arm K, with its blocks N, having lugs or trunnions *c* fitting in the slots *d*, and the crank-shaft C, with its cam *a*, operated by the treadle and levers, as shown, whereby a reciprocating motion is imparted to the rotating rollers and the clothes between them scrubbed, substantially as herein described.

2. In combination with the reciprocating corrugated rollers M M′, with their ratchets *h*, the oppositely-placed pawls S S′ T T′, with their operating-bars O, having the connecting-rod P, provided with an eye, *g*, in which fits the spring-rod *f* of the hand-lever Q, said hand-lever bearing against the spring R,

whereby rotary motion is imparted to the rollers in either direction simultaneously with the reciprocating motion, substantially as herein described.

3. In combination with the pawls T T′ and operating-bars O, said pawls being adapted to engage with the ratchets *h* of the corrugated reciprocating rollers M M′ and impart a rotary motion to said rollers, the adjusting-screw rods U, whereby the feed of the rollers is regulated, substantially as herein described.

In witness whereof we have hereunto set our hands.

JULIUS FRELLOËHR.
FRANZ MAHLER.

Witnesses:
FRIEDRICH NACHTSHEIM,
CHAS. G. YALE.