J. H. CRAIG.

Washing-Machine.

No. 218,717. Patented Aug. 19, 1879.

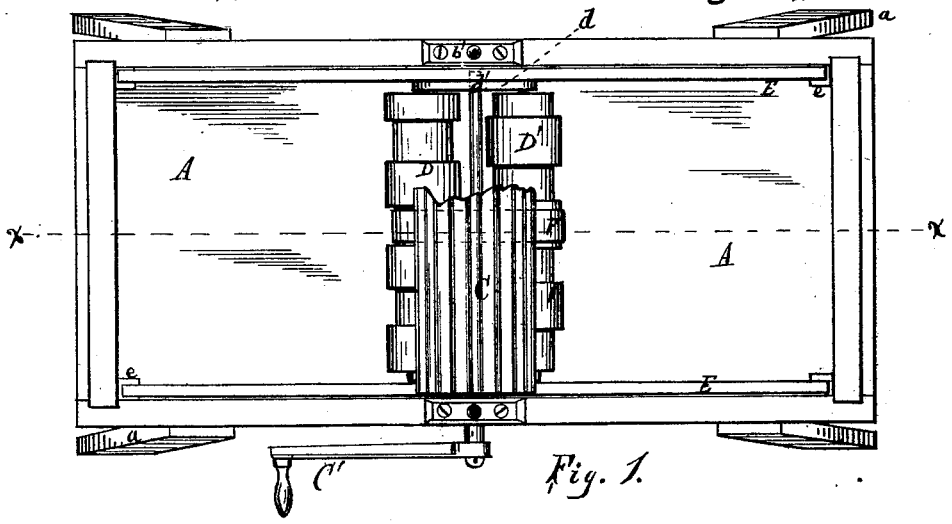

Fig. 1.

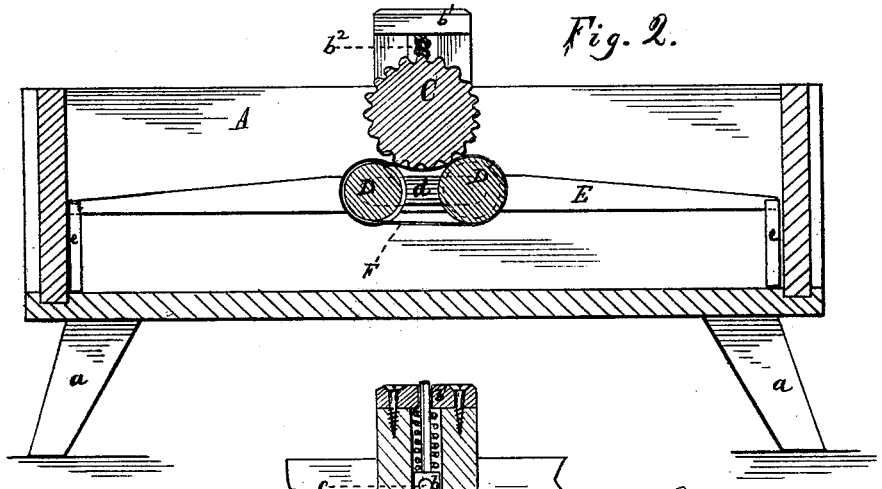

Fig. 2.

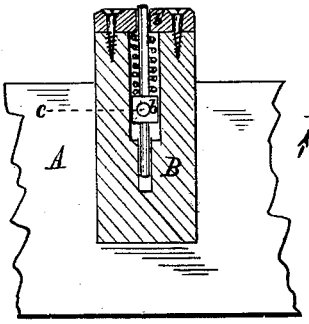

Fig. 3.

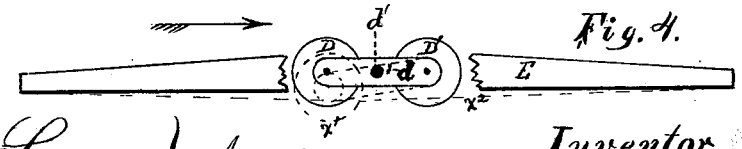

Fig. 4.

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UNITED STATES PATENT OFFICE.

JAMES H. CRAIG, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT TO PHILLIP HEISEL, OF SAME PLACE.

IMPROVEMENT IN WASHING-MACHINES.

Specification forming part of Letters Patent No. **218,717**, dated August 19, 1879; application filed November 19, 1878.

To all whom it may concern:

Be it known that I, JAMES HARVEY CRAIG, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Washing-Machines; and I do hereby declare that the following is 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

In the drawings, Figure 1 is a plan. Fig. 2 is a longitudinal vertical section taken in the line *x* of Fig. 1. Fig. 3 is a vertical section of one of the standards, showing one of the bearings of the upper roller; and Fig. 4 is a vertical view of the self-adjusting oscillating levers and lower rollers.

The nature of my invention relates to that class of washing-machines wherein an intermittent forward and backward rotary motion is imparted to a series of rollers, the clothes being washed by compression between the rollers, and also by agitation.

It consists, principally, in constructing the lower rollers with alternate ribs and grooves, the ribs of one roller being situated opposite the grooves of the other roller, in combination with a belt encircling a rib of one roller and a groove of the other roller, so as to give such rollers different speeds of revolution, and to rub the clothes passing between such rollers and the upper spring-pressed roller; and, further, in the combination of such parts, the large tank, the spring-bars in such tank, and the levers pivoted to such spring-bars and carrying the lower rollers, all as fully hereinafter explained.

In construction my invention is as follows: A is the tank or body of the machine, standing on a series of legs, *a a*. At B is seen the vertical guide and support for the movable journal-bearings *b*, which receive the journals *c* of the roller C, and is kept in position by two vertical round pins, which, entering into corresponding holes in B and cap b^1, permit part *b* to move vertically with freedom. The guide-piece *b* is given a continual downward pressure by means of coiled springs b^2, encircling the upper pin above the bearing *b*.

The roller C is journaled into guide-pieces *b*, as stated, one of which journals terminates in a crank, C′. This roller is corrugated longitudinally, as shown in the drawings, around its entire periphery.

D D′ are smaller rollers, which are journaled into the oscillating levers *d*, which, in turn, are pivoted at *d′* into spring-bars E, which are supported on projecting posts *e e*, situated in the four corners of the body of the machine, where they occupy no essential space.

The rollers D D′ are given a series of flat tongues and grooves turned concentrically and reaching from end to end; but the tongues are somewhat wider than the grooves, and so arranged that the tongue of one roller is placed just opposite to the groove of the other. An endless belt, F, of a few inches in width, encircles rollers D D′, which facilitates the clothes being started through in the first part of the work.

It will be noticed that the belt F encircles a rib on one roller and lies in the opposite groove in the other roller, so that the rollers will revolve at somewhat different speeds, so as to rub the clothes and more thoroughly clean them.

In operation my invention is as follows: Water of the proper temperature and other conditions necessary to washing is placed in the tank. A garment which has been previously soaped is then started in between rollers C above and rollers D D′ below, motion being given by means of the crank C′, which motion is transferred to the lower rollers, D D′, by contact derived by springs b^2 and E pressing the upper and lower series of rollers together. As the garment is rolled nearly through, the motion of crank C′ is reversed, which moves the clothes back again, and so on.

The operator can wash any portion of the garment more than others by making short reciprocating strokes of the handle at the points desired, thus greatly economizing the expenditure of labor.

In this operation it will be observed that the lower rollers are partly immersed in water, thus always keeping the clothes well supplied

with suds. The corrugations of the upper roller coming in contact with the tongues of the lower ones, one crossing the other, the clothes receive in every part very active and forcible compressions, which expand again by capillary attraction on being released, are again compressed, then expanded, &c.

An important assistant to the washing of the clothes is found in the constant and violent shaking of the garments in the water, produced by the action of the corrugated roller on the two lower rollers. The peculiar self-adjusting qualities of the lower rollers with each other becomes apparent by examining Fig. 4. The arrow shows the direction in which a garment is started. The clothes being so folded that a great number of thicknesses occur at one point, this will depress roller D to a point, x^1, and also depress spring-bar E to x^2. This action may occur at both ends of roller D or only at one end, as the case may be. When the enlarged part of the garment moves to roller D′ it is depressed also, as was roller D, motion being derived by the pivot d', as shown. Thus the rollers hug closely any garment, no matter how irregularly it may have been folded. These advantages are considered of utmost importance, and are embodied in a machine convenient in form, simple in construction, and easily operated and understood.

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

1. In a washing-machine, the combination, with the upper spring-pressed roller, C, of the two lower rollers, D D′, constructed with alternate flat ribs and grooves, the ribs of one roller being opposite the grooves of the other roller, and the endless belt F, encircling a rib of one roller and a groove of the other roller, so that the rollers will have different speeds of revolution, substantially as described and shown.

2. A washing-machine wherein are combined the tank A, the spring-bars E in such tank, the lower rollers, D D′, journaled in levers *d*, pivoted to the said spring-bars, such rollers having alternate ribs and grooves, the belt F, encircling a rib of one roller and a groove of the other roller, and the upper spring-pressed roller, C, constructed and arranged substantially as described and shown.

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Witnesses:
T. VAN KANNEL,
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