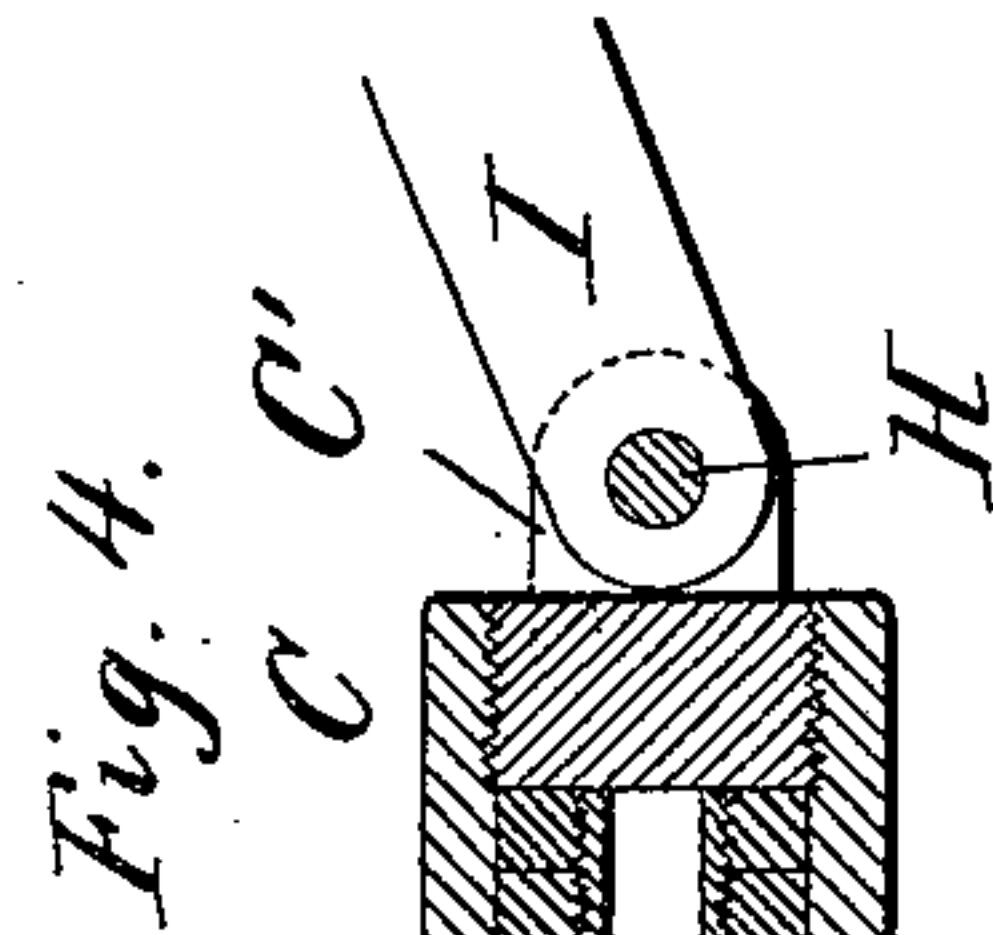
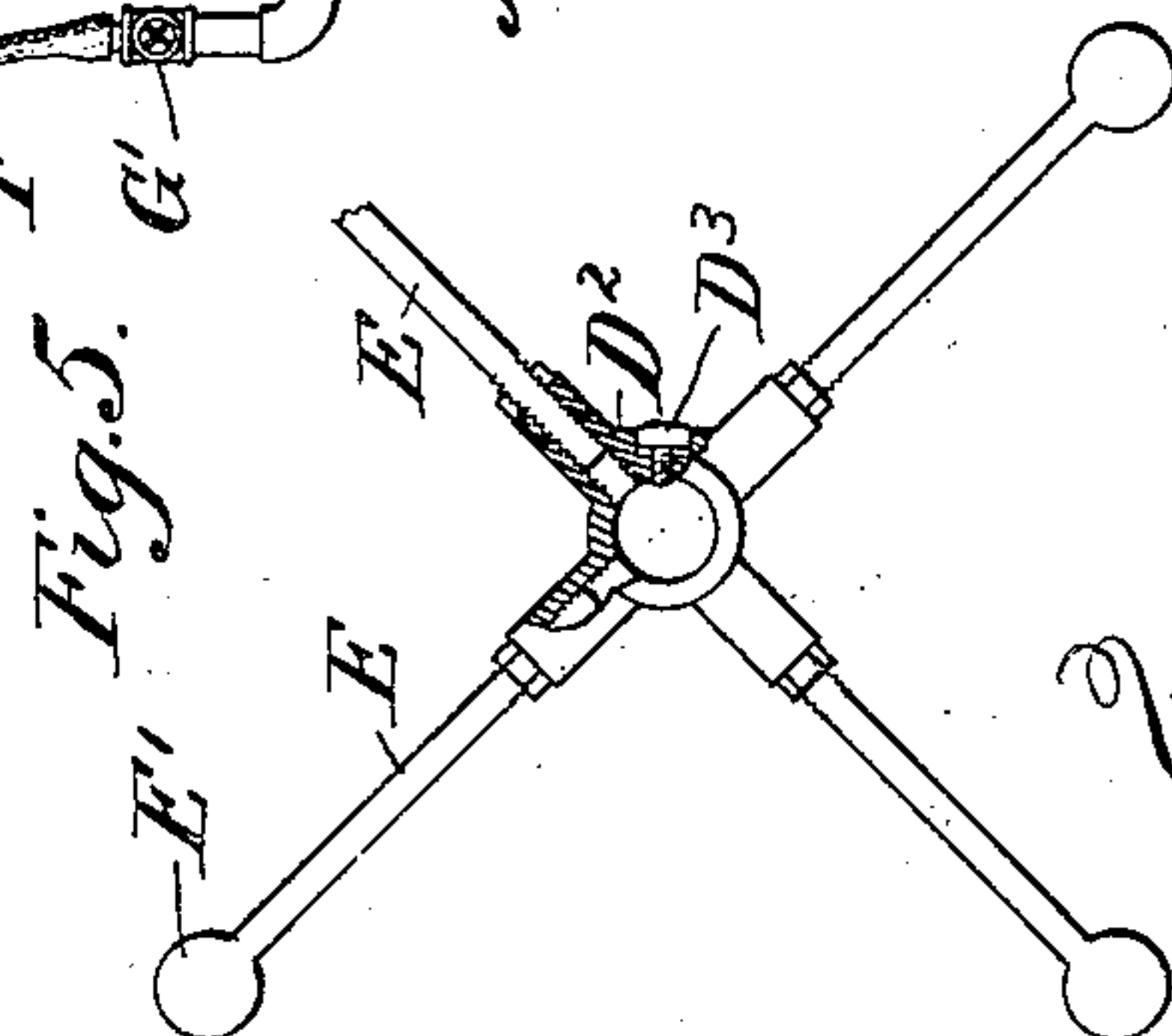
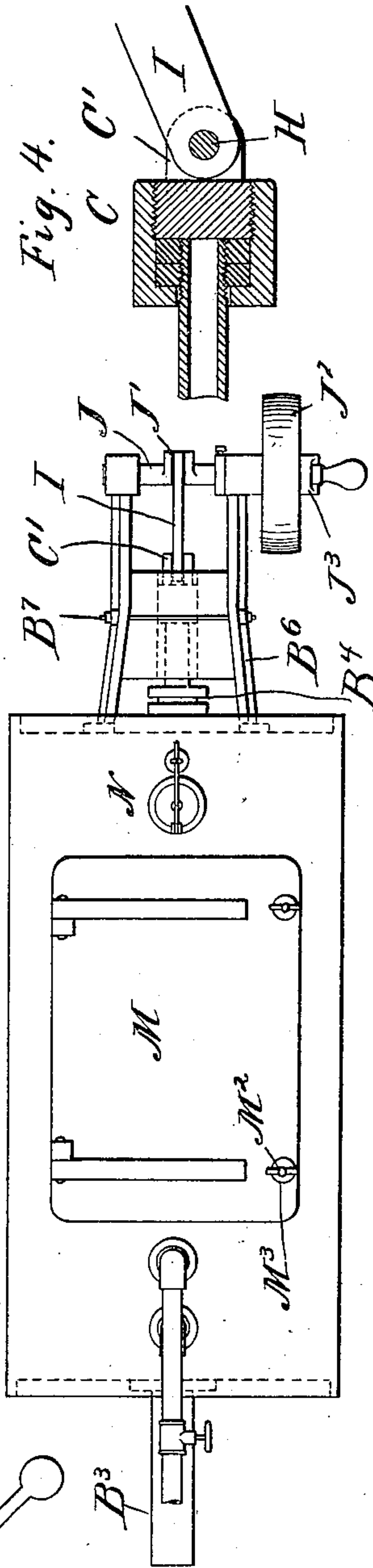
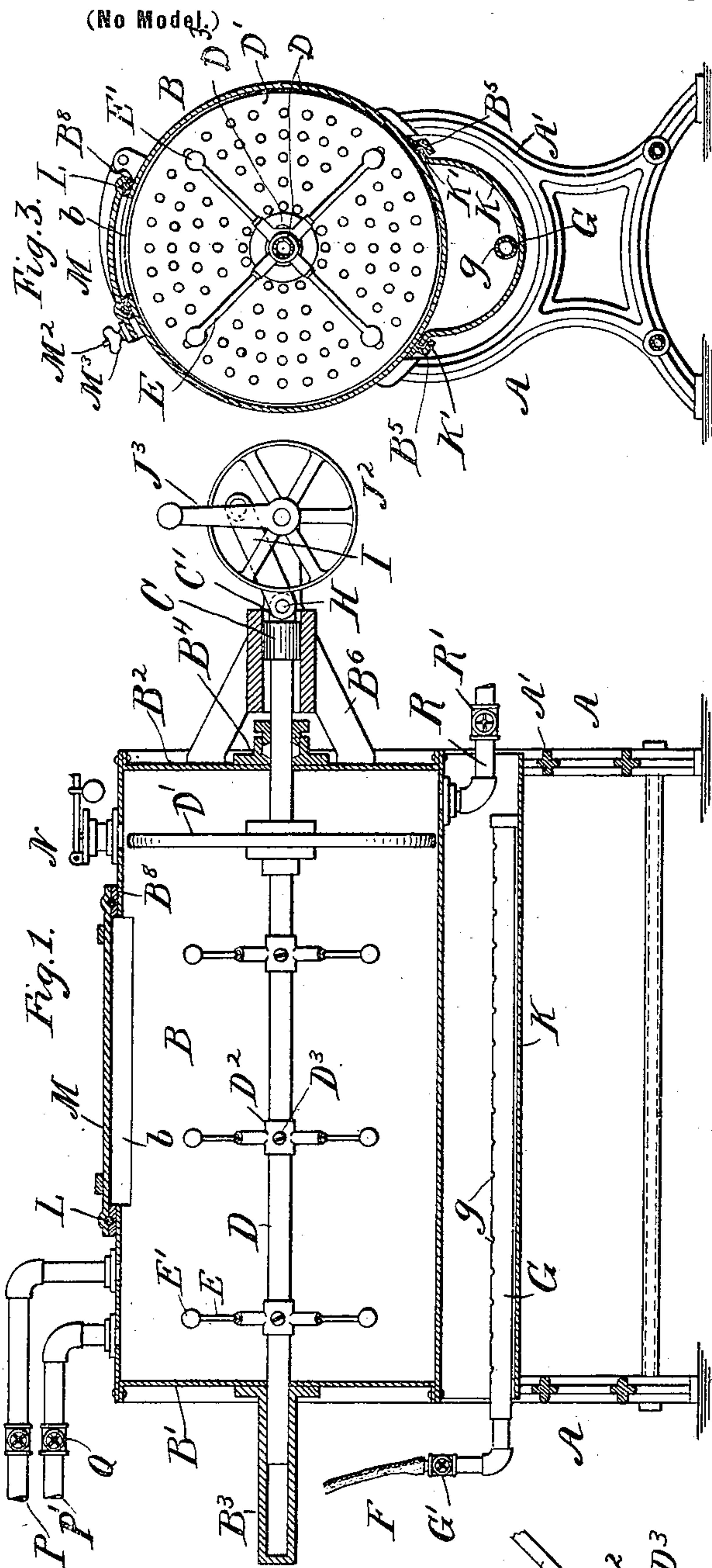


No. 659,663.

Patented Oct. 16, 1900.

W. A. GRANT.  
WASHING MACHINE.  
(Application filed Aug. 17, 1899.)

(No Model.)



WITNESSES:

O. C. Winge.  
J. B. Clautier.

INVENTOR

Wm A Grant  
BY  
Thomas Dyer Stetson  
ATTORNEY



# UNITED STATES PATENT OFFICE.

WILLIAM A. GRANT, OF WEST ORANGE, NEW JERSEY.

## WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 659,663, dated October 16, 1900.

Application filed August 17, 1899. Serial No. 727,508. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. GRANT, a citizen of the United States, residing at West Orange, in the county of Essex, in the State of New Jersey, have invented a certain new and useful Improvement in Washing-Machines, of which the following is a specification.

The improved machine is of the class in which water is admitted either in a cold or previously-heated condition and its temperature increased by heating means beneath the same vessel in which the clothes are washed and, if desired, at the same time while the washing is being performed.

The improvements relate to details of the construction which tend to make the apparatus eminently simple and capable of being produced at low price and kept in order for efficient work with little care or skill.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a longitudinal vertical section. Fig. 2 is a plan view, and Fig. 3 is a cross-section showing the entire machine. The remaining figures represent detached portions on a larger scale. Fig. 4 is a sectional view showing the swivel-joint by which the reciprocating or plunger rod is connected with its actuating devices. Fig. 5 is a transverse section showing one of the hubs and its knobbed pins.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A A are supporting-frames of cast-iron having inverted arches A' in their upper portions. B is a cylinder, of thin boiler-iron or low steel, supported thereby, leaving a clear space for a heating apparatus under the bottom.

B' B<sup>2</sup> are the heads, which may be tightly and permanently secured by riveting through the flanges, as indicated in Fig. 1. A cylindrical pocket B<sup>3</sup> is provided in the head B', adapted to support and guide one end of the reciprocating rod D, which rod plays at the other end through a stuffing-box B<sup>4</sup> in the head B<sup>2</sup> and carries a perforated disk D', which is nearly the size of the interior of the cylinder, and a number of hubs D<sup>2</sup>, secured at intervals in its length by set-screws D<sup>3</sup>. The

hubs are formed with arms which receive screw-pins E, each having a rounded knob E' at its outer end. The function of these smoothly-knobbed pins is to stir the clothes as they are agitated in the water by the reciprocation of the rod D and its attachments.

G is a gas-pipe extending longitudinally beneath the cylinder B and provided with perforations g, thickly distributed in the upper side for the emission of the gas-jets, which being ignited heat the contents of the cylinder by the rapid conduction of heat through the metal plate of the cylinder. The gas is received through a flexible hose F, connected to any convenient source and controlled by a valve G'. The head B<sup>2</sup> has attached to it in the line with the stuffing-box a long and efficient bearing of metal adapted to resist a strong upward and downward force received through the connection to the crank, as will presently appear.

K is a shield of sheet metal partially inclosing the gas-pipe. It is engaged with the cylinder by means of the turned-out edges K' K', which are received in guides B<sup>5</sup>, extending along the under side of the cylinder in the positions represented. This shield incloses a semicylindrical chamber extending under nearly or quite the whole length of the cylinder and defending the gas-jet against disturbing currents of air. This intensifies the heat in its application to the cylinder and allows a sufficient circulation of air for the combustion through each end and can be easily removed to allow any required attention to the gas-pipe and its apertures.

What I have termed the "rod" D is preferably hollow to give the required size and stiffness with moderate weight. The end which extends out through the stuffing-box B<sup>4</sup> is formed with a swivel-joint C, Fig. 4, which is equipped with ears C', carrying a transverse pin H, by which is connected a link I, which engages with a crank J' on a main shaft J on a level with the axis of the cylinder and extending transversely thereto, provided with both a pulley J<sup>2</sup> and a hand-crank J<sup>3</sup> for driving by hand or by a belt impelled by an electric or other motor to impart a high speed to the plunger. The bearings of the shaft are formed in triangular frames B<sup>6</sup> B<sup>6</sup>, secured to or formed integral with the cylinder end B<sup>2</sup>.



These frames, being connected by transverse braces B<sup>7</sup>, form an efficient support and make the machine self-contained and conveniently portable.

5 The top of the cylinder has a liberal opening *b*, surrounded by a frame B<sup>8</sup>, with a channel for receiving a rubber or packing L, which forms a steam-tight seat for a door M, connected to the cylinder by efficient and conveniently-operated movable fastening-bolts M<sup>2</sup>, engaging in open slots (not shown) in the edges of the door, and thumb-nuts M<sup>3</sup>. A cheap and efficient safety-valve N provides against excessive steam-pressure.

15 The water is admitted at will through a pipe P. Cold water can be admitted through a similar pipe P', adjacently located and controlled by a valve or cock Q.

20 The construction of the machine is such that the plunger is reciprocated with short, rapid, and highly-efficient strokes, so that the loosened dirt will be separated from the clothes by the circulation of water induced by the exhaust and expressing action of said plunger.

25 Modifications may be made without departing from the principle or sacrificing the advantages of the invention. The machine may be connected by a flexible hose to a main supplying water from the street, or it may be permanently and stiffly connected by rigid pipes; but I esteem the simpler and cheaper construction preferable. The purpose of the invention is to supply a machine

35 which shall be cheap and portable, and yet allow an efficient pressure of steam to be maintained while the work is being performed with facility for introducing water, soap, rinsing-water, &c. The cylinder may be emptied entirely or partially at will by a pipe R, controlled by a valve R'.

40 The capacity to swivel permits the link to perform its motions in the required vertical plane, while the disk D' and the knobbed arms E E' may turn freely

into any position without occasioning binding at the point of attachment with the connecting-rod. 45

The few parts which require oiling are simple and easy of access. The bearing for the rod, formed by the stuffing-box B<sup>4</sup> and the pocket B<sup>3</sup>, is sufficiently lubricated by the water and the soap. The provisions for heating may be so efficient as to serve well with cold water. When hot water is accessible, it may be supplied to the cylinder through pipe P at a temperature near boiling. My experiments show that it is easy to work with a pressure of steam considerably above atmosphere, and by turning down the gas and operating a few minutes longer the temperature and pressure will be reduced, so that the cock Q may be opened and the interior will receive any further supply of water required. The gas then being let on with full strength and the cock Q again closed, the condition for efficient work will be rapidly resumed. 65

I claim as my invention—

A washing apparatus comprising a stationary vessel equipped to endure steam-pressure, means for applying heat to generate and regulate such, a rod D carrying a disk D' and smoothly-knobbed arms E E' traversing the interior of the vessel, a stuffing-box B<sup>4</sup> in one end and a pocket B<sup>3</sup> in the opposite end coacting therewith to support and efficiently guide such rod, and the link I connected to such rod through a swivel-joint C operating at various angles to reciprocate the rod, combined and arranged to serve without other guiding means, all substantially as herein specified. 75

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses. 80

WILLIAM A. GRANT.

Witnesses:

J. B. CLAUTICE,  
M. F. BOYLE.