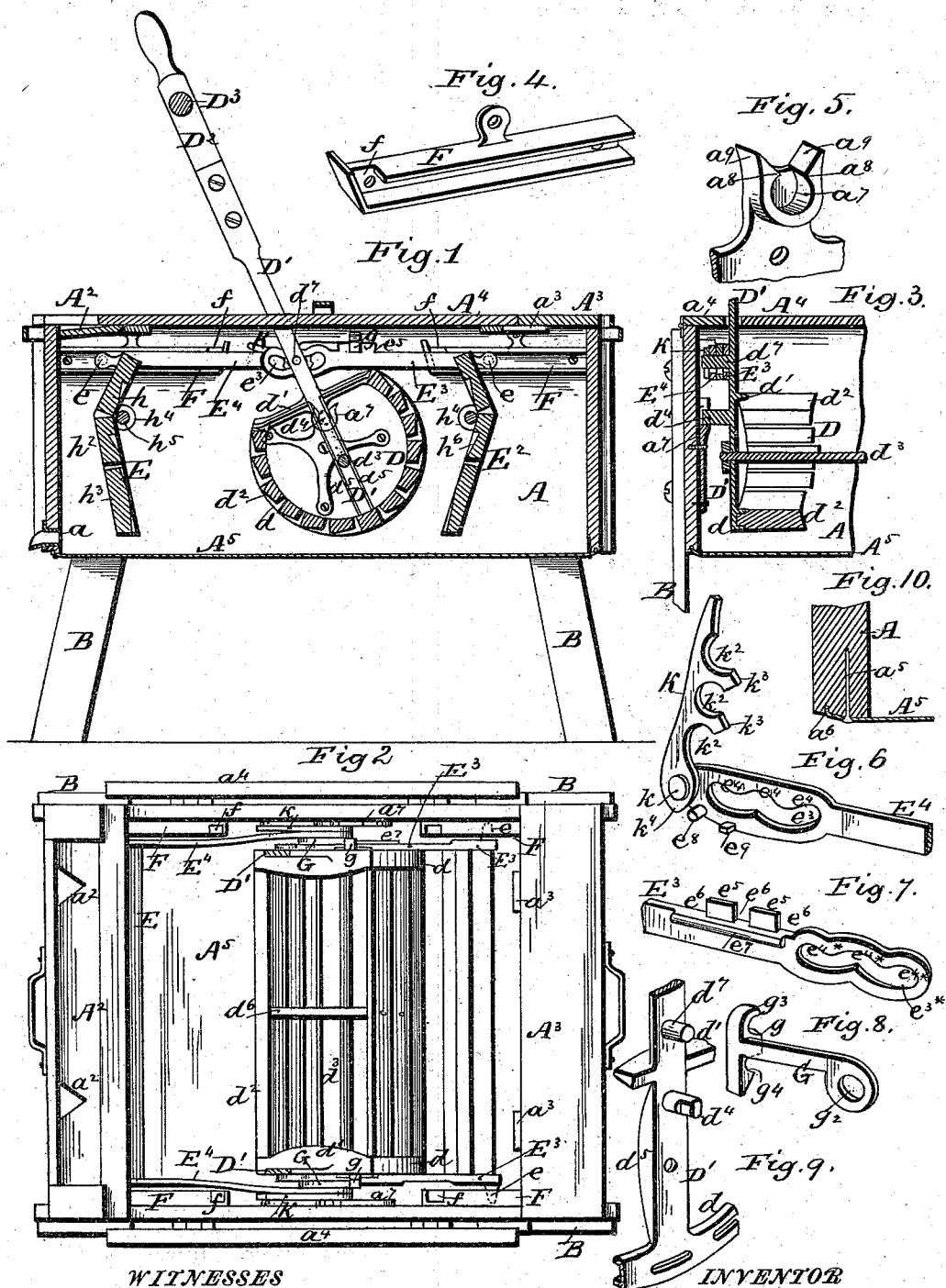


(No Model.)

J. L. KNOLL.
WASHING MACHINE.

No. 530,277.

Patented Dec. 4, 1894.



WITNESSES

A. B. Degges
H. D. Heinriche

INVENTOR

Jonas L. Knoll
by E. E. Masson, Attorney.

UNITED STATES PATENT OFFICE.

JONAS L. KNOLL, OF LEBANON, PENNSYLVANIA.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 530,277, dated December 4, 1894.

Application filed June 10, 1893. Serial No. 477,219. (No model.)

To all whom it may concern:

Be it known that I, JONAS L. KNOLL, a citizen of the United States, residing at Lebanon, in the county of Lebanon, State of Pennsylvania, have invented certain new and useful Improvements in Washing - Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of washing machines wherein the cleansing of the clothes is effected by means of a vibrating slatted rubber and slatted end racks in the interior of the suds-box and connected to the rubber, to receive therefrom a reciprocating motion to agitate and press the clothes placed between said rubber and racks, to facilitate the removal of the dirt therefrom, and substantially as shown in Patent No. 406,918, granted to me July 16, 1889.

The objects of my improvements, are, first, to improve the construction of the bottom of the suds-box to render it lighter, stronger and more lasting; second, to facilitate the prompt removal of the rubber and racks from the suds-box, to divide the weight of that class of machines into substantially two halves and thus facilitate its handling by weak persons; third, to provide the outer ends of the rack arms with outwardly projecting pins to slide in grooved guides secured to the suds-box, and their inner ends with wavy-serrated slots to receive their operating pin, and with peculiarly notched latches to retain each rack-arm adjustably connected to said operating pin.

Other objects and details of construction will be hereinafter described and specifically set forth in the claims.

In the accompanying drawings Figure 1 is a longitudinal vertical section of a washing machine constructed in accordance with my invention. Fig. 2 is a plan view of the same with the cover and the upper part of the handles removed, and the side strips of the top turned up on edge to show the grooved guides and arm connections for the racks. Fig. 3 is a transverse vertical section of a portion of the machine through the center thereof. Fig. 4 is a perspective view of one of the grooved guides for the racks. Fig. 5 is a perspective view on a larger scale of one

of the bearings for the journals of the rubber, and a portion of the frame carrying said bearing. Fig. 6 is a perspective view of the inner end of one of the rack-arms of the outer pair, said rack arm having pivoted to its extreme end a latch having in its under side notches wider at their upper than at their lower portion, the sides of said notches being in the form of double beveled spear-heads. Fig. 7 is a perspective view of the inner end of one of the rack-arms of the inner pair. Fig. 8 is a perspective view of one of the latches to engage with the inner pair of rack-arms. Fig. 9 is a perspective view of a portion of the outer face of one of the end-frames of the rubber showing the flattened or oval stud-pivot thereof and the pivot-pin for the rack-arms. Fig. 10 represents on a large scale a portion of one of the sides of the suds-box and of the sheet metal bottom thereof secured thereto in accordance with my invention.

In said drawings A represents the suds-box supported upon legs B and provided with an outlet *a* for drawing off the water. The stationary portion A^2 of the top, at one end of the box is slightly inclined and may be used as a soap-receptacle. It has two perforations a^2 therein to receive the legs of a wringer. The stationary portion A^3 of the top at the opposite end of the box has cleats a^3 secured to its under side to receive one end of the cover A^4 , the opposite end thereof resting upon the opposite portion A^2 of the top. To the sides of the box adjacent to their upper edge, wood-straps a^4 are hinged to permit them to be swung outwardly when it is desired to take off all the movable inner parts of the machine to render the suds-box suitable for rinsing clothes.

The bottom of the suds-box is not made of wood, as said material is objectionable on account of its shrinkage during dry weather, and undue swelling when the box is filled with hot suds or water, causing the sides to be pushed apart. In this machine the bottom A^5 consists of sheet-metal, preferably zinc secured to the bottom edge of the ends and sides A of the box by means of nails a^5 Fig. 10, driven at suitable distances apart through said zinc and into the bottom edge of said ends and sides. Said bottom edge is preferably slightly beveled outwardly, and to add

to the retaining property of the nails and to the liquid retaining capacity of the fastening, the edge of the sheet metal is flanged and forced into the edge of the lumber as at a^5 by means of a suitable calking chisel. To the inner surface of the box are secured the bearings a^7 for the journals or stud-pivots d^4 of the rubber D. Said rubber consists of two metallic disks or rings d having a series of slots or pockets on their inner side to receive the ends of the slats d^2 extending from one ring to the other. Said rings are united together by means of a bolt d^3 in the center thereof. An arm D' extends diametrically across the ring from its lower periphery to its upper cross bar d' and projects upward on top of said cross bar. To the upper ends of said arms are secured the side pieces D^2 of the handle D^3 said side pieces passing through slots between the cover A^4 and the hinged strips a^4 of the suds-box. To permit the rings d to withstand the powerful traction of the bolt d^3 and nut thereon, the portion of the arm D' within the ring is provided with an arched rib d^5 on each side of the bolt d^3 , and the cross bar d' is also provided with an arched rib. To support the slats d^2 against external pressure a substantially cylindrical block d^6 is placed in the center of the rubber and each slot is pinned thereto, dividing the interior of the rubber into two equal chambers.

The racks E and E^2 operated in connection with the rubber have projecting outwardly from their upper ends pins e by which they are supported; said pins being received in grooved guides F secured to the inner face of the sides of the suds-box adjacent to the top thereof. In the top rib of each of said guides adjacent to the inner end thereof there is a groove f for the passage of the pins e at the time that the racks and rubber are placed within the suds-box before doing a washing, or at the time said parts are removed from the suds-box. The racks E^2 have projecting inwardly from their upper ends arms E^3 , and within the ends of said arms peculiarly shaped slots e^3 are formed. The upper edge of each of said slots has wavy serrations to form three (although it may have more) shallow pockets e^4 either one of which is intended to receive in engagement a pin d^7 projecting outwardly from the face of the arms D' of the frame of the rubber D. To securely retain the pin d^7 in engagement with either one of the pockets e^4 , each arm E^3 has teeth e^5 projecting from its upper edge to obtain seats e^6 alongside of said teeth, and with either one of said seats, a latch g is made to engage. Said latch is mounted upon and made to project inwardly from the side of the arm G that has in its inner end a round hole g^2 of slightly larger diameter than the pin d^7 in which said pin is received as a pivot for the latch. Said latch has a bent upper lip g^3 by which it can be pushed outwardly and lifted by the operator to adjust its position in one of the seats e^6 ; but to retain the latch g normally in engagement with the seats

e^6 the latch is provided with a groove g^4 in its side and thereunder, for engagement with a rib e^7 on the outer face of the arm E^3 . The body of the arm E^3 having no pivot hole therethrough is not weakened by the removal of any metal from said body.

The racks E have projecting inwardly from their upper ends arms E^4 , and within the ends of said arms, the peculiarly shaped slots e^{3*} are also formed having wavy serrations to form shallow pockets e^{4*} either one of which is intended to receive the pin d^7 in engagement. To securely retain said pin d^7 in engagement with either one of the pockets e^4 and e^{4*} each arm E^4 has pivoted to its extreme end at k a latch K having in its under side notches k^2 that may be called of dovetail form, being wider in their middle than in their lower portion, the sides of said notches being in the form of pendent double beveled spear head partitions k^3 that are more reliable than parallel sides to remain in engagement with the pin d^7 when the parts are wet with slippery soap suds. To prevent the latch K from being swung more than an arc of about one hundred degrees upon its pivot, the end of said latch adjacent to said pivot has a projection k^4 , to strike against a lug e^8 projecting from the side of the arm E^4 . Said arm has also a lug e^9 on the side thereof to keep the latch from being revolved too far in the opposite direction while out of engagement with the pin d^7 . By having the pivot k for the latch K at the outer end thereof in place of at any point on the arm E^4 between the slot e^3 and the rack E, said arm E^4 is not weakened by the removal of any metal from its body to form the pivot-hole.

To prevent the rubber D or its pivot pins d^4 from jumping out of the bearings a^7 , when the operator gives too great an oscillation to said rubber, or when shipped to uninitiated operators with the side pieces D^2 of the handle in a position nearly parallel to the top of the suds-box, the pins d^4 have their sides flattened, and the upper portion or opening a^8 to the bearing a^7 is narrower than the interior of said bearing. The width of the opening a^8 is substantially equal to the width of the flattened portion of the pin d^4 , while the diameter of the interior of the bearing a^7 is substantially equal to the vertical diameter of said pin d^4 . Above the opening a^8 the sides of the bearing are outwardly flaring at a^9 to permit the operator to easily direct the pins d^4 within their bearings, while replacing the rubber D and the racks E E^2 connected thereto, within the suds-box.

To retain the slotted end of the pair of side arms E^3 and particularly the slotted end of the pair of side arms E^4 of the castings of the racks sprung toward the rubber D, and at the same time retain the ends of the slats h within their pockets in said rack-castings, each of said castings has a perforated lug h^4 projecting from its inner edge, toward the rubber, and bolts or headed rods h^5 are

received into and retained by said lugs. The slats h h^2 are wider than those shown in my Patent No. 406,918, to render them stronger, and are provided on their inner side with a groove h^6 having a beveled face and a rectangular edge to properly operate upon the clothes placed between them and the rubber.

By having the rack arms connected to the rubber in a substantially permanent manner, the operator by lifting said rubber out of the suds-box removes also at once the racks from said suds-box, leaving the latter free of incumbrances, to clean it out, adapt it for rinsing clothes, and reduces its weight about one half.

Having now fully described my invention, I claim—

1. In a washing machine the combination of a suds-box, bearings a^7 centrally secured to the sides of said box and having a top opening to said bearing narrower than its interior, a cylindrical rubber D having slat-retaining cast ends provided with arms D' , and pins d^4 outwardly projecting from said arms and having their sides flattened, their short diameter corresponding with the narrow opening of the bearing and their long diameter corresponding with the interior of said bearing substantially as described.

2. The combination of a suds-box, a cylindrical rubber pivoted in bearings secured to the sides of said box, the end castings of said rubber having arms D' provided with pins d^7 , two racks having arms, each arm provided with a slot in its inner end adjustably connected with the pin d^7 , and a pin e outwardly projecting from its outer end, with grooved guides F receiving the pins e and secured to the sides of the suds-box substantially as described.

3. The combination of a suds-box, a cylindrical rubber pivoted in bearings secured to the sides of said box, the end castings of said rubber having arm D' provided with pins d^7 , a rack E having arms E^4 provided with a wavy-serrated slot in its inner end, a latch K pivoted to the extreme end of said arms and having notches separated by double beveled spear-head partitions between said notches with a rack E^2 having slotted arms E^3 adjustable upon the pins d^7 the slots in said arms having pockets e^4 substantially as described.

4. The combination of a suds-box, a cylindrical rubber pivoted in bearings secured to the sides of said box, the end castings of said rubber having arms D' provided with pins d^7 , a rack E^2 having arms E^3 provided with a wavy-serrated slot in its inner end and teeth e^5 upon its top, a latch g pivoted upon the pin d^7 and in engagement with one of said teeth, and a rack E having slotted arms adjustable upon the pins d^7 substantially as described.

5. The combination of a suds-box, a cylindrical rubber pivoted in bearings secured to the sides of said box, the end castings of said rubber having arms D' provided with pins d^7 , racks, and horizontal rack arms adjustably connected at one end with said pins d^7 and at the other with supporting pins e , with grooved guides F for said pins e , said guides being secured to the suds-box above said racks substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JONAS L. KNOLL.

Witnesses:

GIDEON K. SHANAMAN,
SAMUEL E. SMITH.