

No. 627,968.

Patented July 4, 1899.

P. T. BENBOW.
WASHING MACHINE.

(Application filed Jan. 30, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

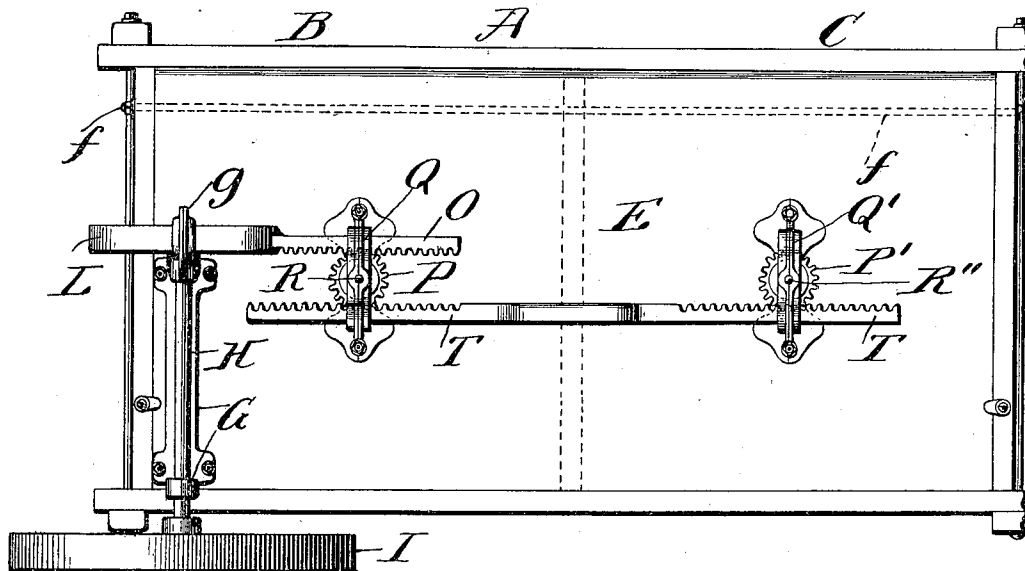
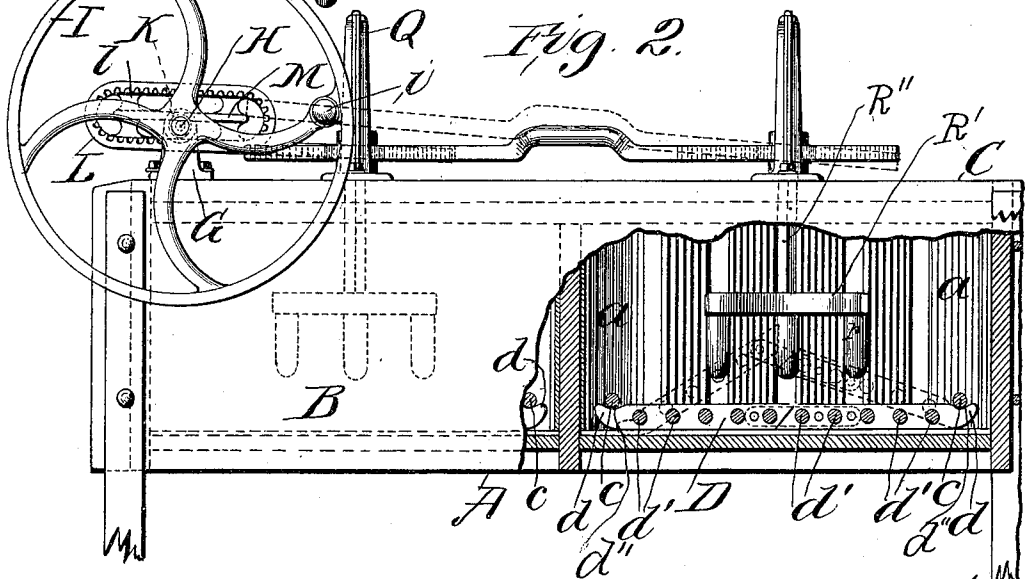


Fig. 2.



Attest:

W. H. Scott.

Ralph Talish

Inventor:

Paris T. Benbow.

by Oakwell & Cornwells
Attys.

No. 627,968.

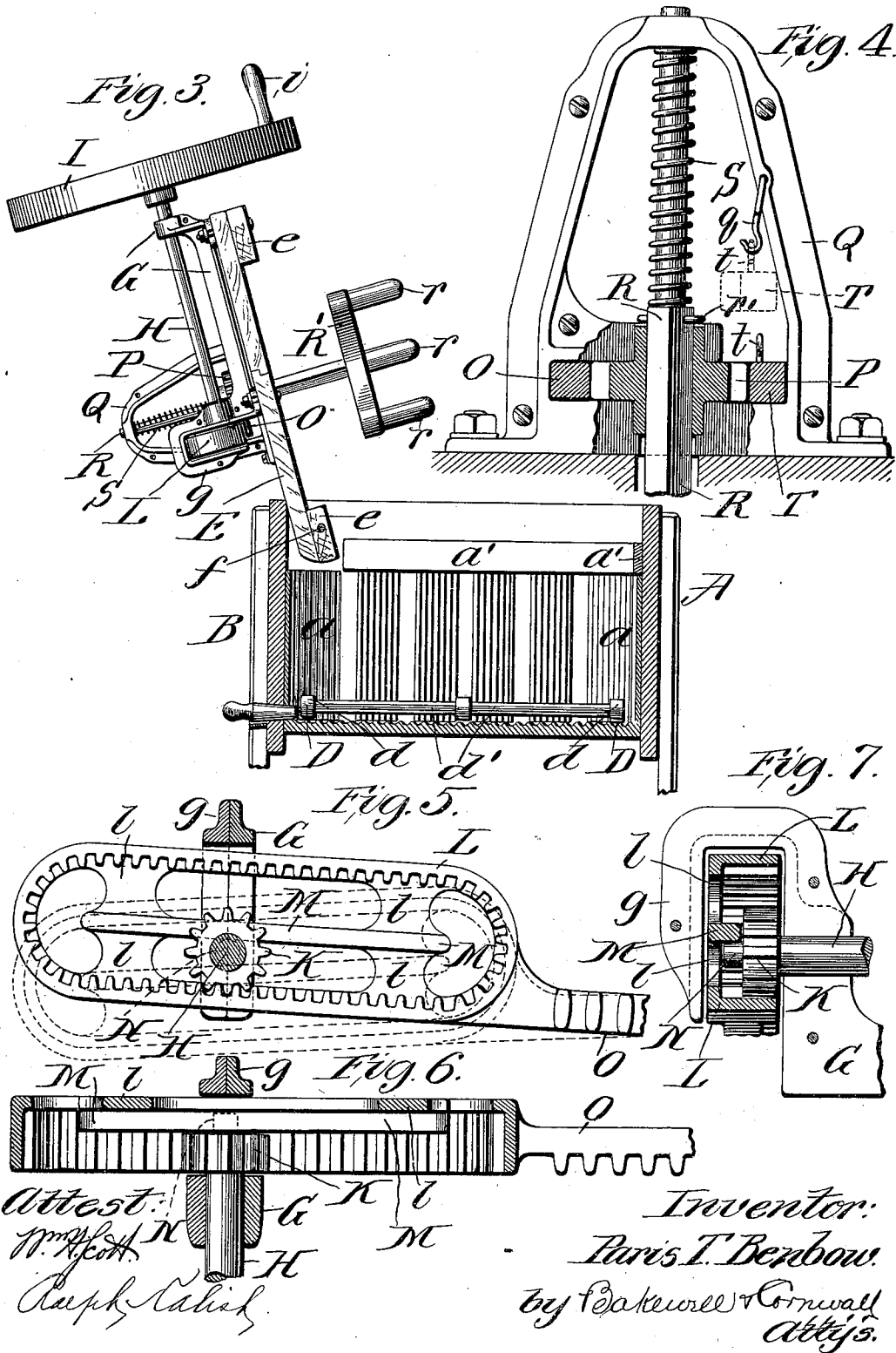
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2 Sheets—Sheet 2.



Attest:

N. T. Benbow

Ralph Talbot

Inventor:

Paris T. Benbow

*by Beakwell & Cornwall
Attys.*

UNITED STATES PATENT OFFICE.

PARIS T. BENBOW, OF ST. LOUIS, MISSOURI.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 627,968, dated July 4, 1899.

Application filed January 30, 1899. Serial No. 703,807. (No model.)

To all whom it may concern:

Be it known that I, PARIS T. BENBOW, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Washers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view of my improved washing-machine. Fig. 2 is a side elevational view, part of the near wall being removed to show the interior. Fig. 3 is a cross-sectional view showing the lid thrown back in end elevation. Fig. 4 is an enlarged elevational view of the upper end of the staff which carries the agitators. Fig. 5 is an enlarged detail side elevational view of the mechanical movement for converting the rotatory movement into a reciprocatory movement. Fig. 6 is a longitudinal sectional view through the same, and Fig. 7 is a cross-sectional view through the same.

This invention relates to a new and useful improvement in washing-machines, the object being to construct a machine of the character described with two receptacles, enabling the operator to wash clothes in the first and second suds at the same time, suitable mechanism being provided that the agitators in each receptacle can be operated from the same source of power, or they may be disconnected and the power directed solely to one set of agitators in one receptacle. By arranging the two receptacles in a single box the clothes may be wrung out of the first suds-box directly into the second suds-box, which saves extra handling and allows the garments to become cooled while waiting for the balance of the wash to be put through the first suds. A false bottom is also provided in each receptacle, which bottoms are preferably made of hard wood and so constructed that the dirt from the clothes being washed settles underneath and is not ground into the wash, thus producing good results and admitting of a much longer use of the suds.

With this object in view the invention consists in the novel construction, arrangement, and combination of the several parts, all as

will hereinafter be described, and afterward pointed out in the claims.

In the drawings, A indicates a box-like casing as an entirety, which is provided with a central partition, dividing the same into two compartments B and C, the former being designed for washing the clothes through what is known as the "first suds" and the latter for washing the clothes through the second suds. The floors of these compartments are preferably corrugated, while the side walls are provided with corrugated strips, corner-blocks *a* being introduced to fill out the corners and also afford additional rubbing-surface. Near each end of these receptacles and in the lower portion thereof are arranged cross-rungs *c*, preferably of wood, under which are introduced the ends *d* of a frame D, which frame has mounted in it suitable rungs or wooden bars *d'*, constituting the false bottom. Frame-rails D are divided obliquely at about their middles, as shown more clearly in Fig. 2, and these two sections of the frame are hinged together, so that it may be inserted in and removed from the compartment, and in inserting or removing the ends *d* into or from their designed position under the rods or rungs *c* said frame-rails are broken or, rather, bent upwardly, as shown by dotted lines in Fig. 2.

d' indicates suitable concavities formed on the upper face of the frame D and near the outer ends thereof, said concavities being designed for coöperation with the rungs *c*, and by which construction, after the ends of said frame D are placed thereunder, longitudinal movement of said frame is prevented. By curving the ends of the frame D, as is clearly illustrated in Fig. 2, said frame will, when properly inserted and pressed down, adjust itself to its locked position under said rungs *c*, as is obvious. Suitable openings are arranged in the receptacles, near the bottoms thereof, for drawing off the water, as is well understood.

In ordinary washing the false bottom is used; but where a great number of articles are introduced into the machine this false bottom may be removed to give more space, when the corrugated bottom will act as a rubbing-surface.

E indicates a cover on whose under side is

arranged a cleat *e*, through which cleat passes a rod *f*, mounted in the end walls and the central partition of the box, so that said cover can be thrown back, as shown in Fig. 3, for the introduction and removal of the clothes to and from the receptacles. A suitable supporting-cleat *a'* is arranged inside the box A for supporting this cover in its closed position.

Mounted on cover E, preferably by being bolted thereto, is a casting G, whose ends are provided with suitable bearings for power-shaft H, on the outer end of which shaft is a hand-wheel I, provided with a handle *i* for rotating said shaft, or, if desired, a belt may be placed around said wheel where this kind of power is accessible. The inner end of shaft H carries a pinion K, which meshes with an endless rack formed on a suitable casting L. Casting L, as shown more clearly in Figs. 5 and 6, is so constructed that the teeth formed thereon make a continuous or endless rack with two straight sides, the ends thereof being connected, as shown. The rear side of this casting is bridged by connecting-pieces *l*, from which connecting-pieces extend a rider guide-plate M, which coöperates with a stud or pin N, axially in line with shaft H and projecting rearwardly from the rear face of pinion K. The casting G on its rear end is formed with an overhanging projection *g*, which acts as a guide for casting L, holding the same in proper relation to pinion K.

Extending forwardly from casting L is a rack-bar O, which meshes with a pinion P, mounted in a suitable framing or casting Q. (Shown more clearly in Fig. 4.) Pinion P is preferably provided with hubs on each side engaging the casting above and below the same, whereby said pinion is held in position against vertical movement, the casting being provided with suitable bearings, so that the pinion cannot have lateral movement. Pinion P is also formed with a non-circular (square) opening, through which passes a squared shank R of the staff, carrying the spider-frame R' on its lower end, in which spider-frame are mounted pins *r*, being what are known as the "agitators." A suitable cotter-pin *r'* is arranged through the upper end of this squared shank, while above said squared portion the shank is preferably circular in cross-section, its upper extremity passing through a guide-bearing in casting or framing Q. A spring S surrounds this circular portion for the purpose of holding the agitators in a power position, but which spring in the event that said agitators meet an obstruction tending to force them upwardly will yield to permit such upward movement, thus rendering the parts not liable to breakage in operation.

T indicates a rack-bar engaging with the opposite side of pinion P, said rack-bar extending longitudinally the machine and engaging a pinion P', mounted in a casting Q', for rotating a staff R'', the parts of this second mechanism being substantially the same as that heretofore described. This second

mechanism, however, is designed to rotate the agitator in the receptacle C, while the mechanism first described is designed to rotate the agitator in receptacle B. In order to disengage the rack T from the pinion P when it is desired that the clothes in the first receptacle only shall be washed, I elevate said rack, as shown by dotted lines in Fig. 4, and by the use of a hook *q* on casting Q engaging an eye *t* of the rack-bar T said rack-bar is held out of engagement with pinion P. When it is desired to have both sets of agitators in operation, it is obvious that rack-bar T is unhooked and engages with the pinion P. The teeth of both of the racks O and T are preferably thicker in their middle portion when viewed from the direction as seen in Fig. 5 for the purpose of permitting said rack-bars to rock slightly when in mesh with their respective pinions, as said rack-bars do not at all times occupy a parallel relation with the face of said pinions, as will be clearly understood.

The operation of the mechanism above described may be briefly stated as follows: Shaft H is designed to be rotated continuously in one direction to impart a reciprocatory movement to the rack O, which in turn rotates pinion P in opposite directions and oscillates the staff mounted in said pinion, it being understood that the hand-wheel I, mounted on said shaft H, can be rotated in either direction, the ultimate result being the same. When the pinion P' is in mesh also, its operation is substantially the same as that of the pinion P. Continuous rotation in one direction being imparted to shaft H will cause the gear K to mesh with the teeth of casting L, the stud or pin N, engaging the rider-bar M, holding said parts into mesh. Pinion K will force casting L in one direction or the other, depending upon the rotation of pinion K, until the end of the casting is reached, when the pinion will climb up or down the circular arrangement of teeth on the casting, and the rider-bar M terminating there and being in proper relation to the pin N will hold the pin in engagement with said teeth until the stud or pin N gets above or below the rider-bar, when pinion K will immediately cause the casting L to move in the opposite direction until the other end thereof is reached, when practically the same cycle of movements is gone through. Casting L is practically a floating rack-bar—that is, pinion K is fixed with relation to said casting—and by the construction of casting Q, in which the rack-bar O is guided, said casting practically acts as a pivot-point for said rack-bar, holding the same constantly in engagement with pinion P, permitting the rear end of said rack-bar, or that end on which casting L is arranged, to move up and down and likewise forward and backward.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my machine can be

made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. In a washing-machine, the combination with the box or casing, of bearings arranged thereon, a shaft mounted in said bearings, a pinion on the end of said shaft, a casting formed with a continuous rack-bar in engagement with said pinion, an axial stud-pin N, projecting from said pinion, a rider-bar M which is inclosed by said continuous rack, said rider-bar cooperating with said stud-pin to hold the pinion in constant mesh with the continuous rack, a guide on one of the shaft-bearings for guiding said casting in its movement, a rack O, provided on one side of said casting, a pinion P, with which said rack meshes, a vertical shaft on which said pinion is mounted, and a bearing for said shaft, which bearing also serves as a guide for the rack O; substantially as described.

2. In a washing-machine the combination with the cover, having the bearings G and Q mounted thereon, the former being provided with an overhanging projection *g*, on one of its ends, a driving-shaft H mounted in casting G, and a driven shaft R, mounted in casting Q, pinions K and P mounted on said shafts respectively, and a floating rack-bar in mesh with said pinions, and arranged to be guided by the overhanging projection *g*, and the casting A, said rack-bar consisting of a casting L, provided with gear-teeth forming a continuous rack on its front face, which mesh with the pinion K, connecting-pieces bridging the rear side of the casting and carrying a rider guide-plate M, and a rack-bar O, extending laterally from casting L, and meshing with the pinion P; substantially as described.

3. In a washing-machine, the combination with a hinged cover, of a casting G secured thereon, and forming bearings, said casting being provided with an overhanging projection *g*, a shaft mounted in said casting, a pinion K mounted on the end of said shaft, a casting L, formed with gear-teeth, which make practically a continuous rack, a rider-bar M inclosed by said teeth, a pin N on the pinion cooperating with said rider-bar, a rack-bar O extending from said casting L, a pinion P with which said last-named rack-bar cooperates, and a shaft R, on which said pinion is mounted, said shaft carrying a spider-frame R', and pins *r*; substantially as described.

4. In a washing-machine, the combination with the box or casing, of bearings arranged thereon, a shaft mounted in said bearings, a pinion on the end of said shaft, a casting formed with a continuous rack-bar in engagement with said pinion, an axial stud-pin N, projecting from said pinion, a rider-bar M which is inclosed by said continuous rack, said rider-bar cooperating with said stud-pin to hold the

pinion in constant mesh with the continuous rack, a guide on one of the shaft-bearings for guiding said casting in its movement, a rack O, provided on one side of said casting, a pinion P, with which said rack meshes, said pinion being formed with a non-circular opening, a shaft which is non-circular in cross-section for a portion of its length, said non-circular portion passing through said pinion and carrying rubbing-pins on its lower end, the upper portion of said shaft above said pinion being practically circular in cross-section, so as to form a shoulder between the two portions of the shaft, a bearing Q, for the upper circular portion of said shaft, and said pinion, said bearing also acting as a guide for the rack O, and a spring S interposed between the upper part of said bearing and the shoulder at the junction of the circular and non-circular portions of said shaft; substantially as described.

5. The combination with a suitable box-like casing having a plurality of compartments, of agitators arranged in each compartment, staves on which said agitators are arranged, pinions mounted on said staves, a removable rack-bar T in mesh with said pinions, a rack-bar O in mesh with one of said pinions, castings forming bearings for said staves and pinions, said castings also guiding said rack-bars in their movement and maintaining proper relations therebetween and the pinions with which they mesh, an endless rack provided on one end of the bar O, a pinion in engagement with said endless rack, and a rotatable driving-shaft on which said pinion is mounted; substantially as described.

6. The combination with a suitable box-like casing having a plurality of compartments, of agitators arranged in each compartment, staves on which said agitators are arranged, pinions mounted on said staves, a removable rack-bar T in mesh with said pinions, a rack-bar O in mesh with one of said pinions, castings forming bearings for said staves and pinions, said castings also guiding said rack-bars in their movement and maintaining proper relations therebetween and the pinions with which they mesh, an endless rack provided on one end of the bar O, a pinion in engagement with said endless rack, a rider-bar inclosed by said endless rack, a stud-pin extending axially from said pinion and cooperating with said rider-bar, a driving-shaft on which said pinion is mounted, and a casting forming bearings for said shaft, said casting being provided with an overhanging portion to guide the endless rack in its movement and hold the same in mesh with its cooperating pinion; substantially as described.

7. The combination with the box A having cross-bars *c* arranged in its side walls a little distance above the bottom, of the frame D composed of hinged sections and cross-bars, the ends of said frame being recessed on their upper faces to form upwardly-curved ends which are passed under the cross-bars *c* when

the sections of the frame are at an angle, and when said sections assume a horizontal position on the bottom of the box, the recessed ends receive the cross-bars *c* and lock the frame against lateral movement; substantially as described.

8. The combination with a suitable box-like casing having a plurality of compartments, of agitators located in each compartment, staves on which said agitators are arranged, pinions mounted on said staves, means for rotating one of said pinions in opposite directions, a rack-bar meshing with the pinions of each agitator in each compartment for trans-

mitting motion from the first driven pinion to the balance of said pinions, and means for holding said rack-bar out of mesh with said first driven pinion when it is undesirable to operate all of said pinions, substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 25th day of January, 1899.

PARIS T. BENBOW.

Witnesses:

F. R. CORNWALL,
WM. H. SCOTT.