

J. BAUER.
WATER MOTOR.
APPLICATION FILED JULY 27, 1911.

1,022,813.

Patented Apr. 9, 1912.

2 SHEETS—SHEET 1.

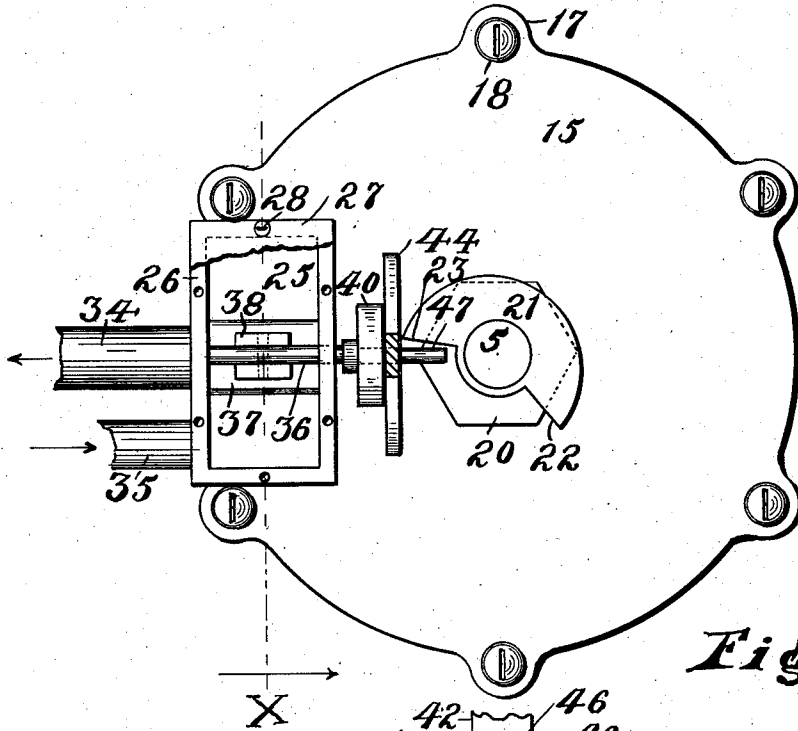


Fig. 1

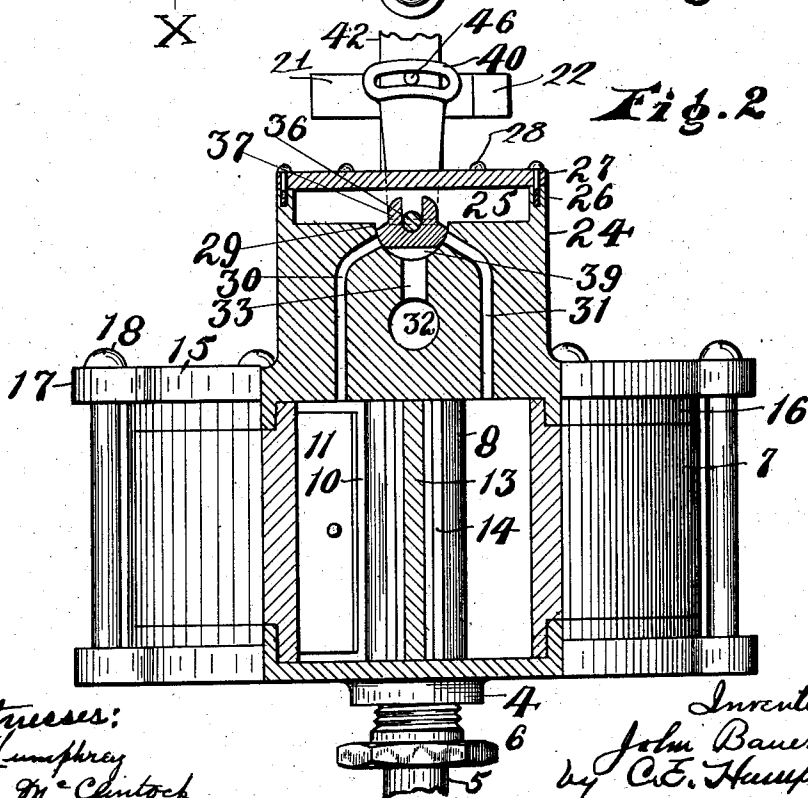


Fig. 2

Witnesses:
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by C. E. Humphrey atty.

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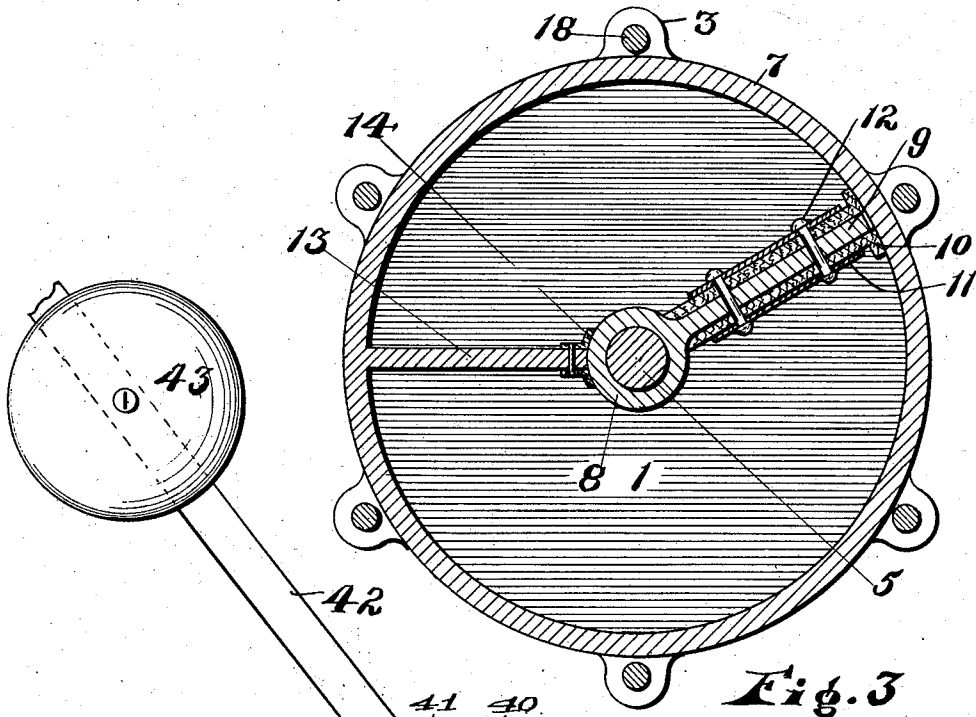


Fig. 3

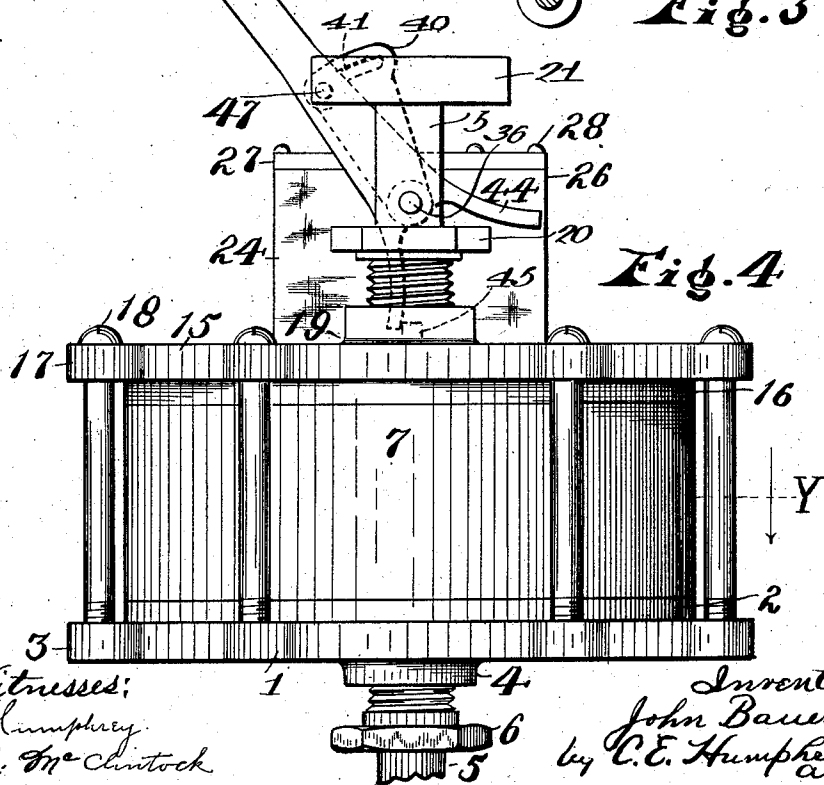


Fig. 4

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UNITED STATES PATENT OFFICE.

JOHN BAUER, OF AKRON, OHIO.

WATER-MOTOR.

1,022,813.

Specification of Letters Patent.

Patented Apr. 9, 1912.

Application filed July 27, 1911. Serial No. 640,806.

To all whom it may concern:

Be it known that I, JOHN BAUER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful Improvements in Water-Motors, of which the following is a specification.

This invention relates to improvements in water motors and especially to the type employed for operating washing-machines.

The object of the invention is to provide a water motor of simple design, embodying a minimum number of parts, capable of use for imparting to a shaft an intermittent, alternate, partial rotation so that the agitator secured to the shaft within the body of the washing-machine may be correspondingly actuated for the purpose of efficiently washing the clothes contained therein.

A further object is to construct a device of the class described which will be strong, durable, easily constructed, having as few parts as possible and which will carry out efficiently the object of imparting an alternate, intermittent, partial rotation of the agitator shaft.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be hereinafter specifically described and illustrated in the accompanying drawings which form a part hereof wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings in which similar reference numerals indicate like parts in the different figures, Figure 1, is a plan of a motor embodying this invention with portions thereof broken away to better illustrate the internal construction of the same; Fig. 2, is a vertical, sectional view on line X of Fig. 1; Fig. 3, is a horizontal, sectional view on line Y of Fig. 4; and, Fig. 4, is a view in side elevation looking from the right of Fig. 1 with a portion of the mechanism broken away for the purpose of making the drawings clearer.

Referring to the drawings the reference numeral 1 denotes the lower head of the cylinder of the motor and it embodies a circular plate surrounded by an annular marginal flange 2, projecting from which at

regular intervals are a plurality of lugs 3 provided with threaded apertures. The under face of the head 1 is provided with a depending boss or hub 4 provided with a central aperture to receive a shaft 5, the joint between the shaft 5 and the hub 4 being rendered fluid-tight by means of a packing-gland 6.

Mounted on the marginal flange 2 of the head 1 is the cylinder-casing 7 of the motor which is provided with a rabbeted edge to seat on said flange. The shaft 5 extends vertically and centrally of the casing 7, and supports within the casing a horizontal revolvable piston comprising a sleeve 8 fixedly secured to the shaft and a radially-projecting blade 9. On the sides of the piston 9 are layers of packing material 10 held in position by means of plates 11 secured to the blade 9 by means of hold-fast devices 12. The outer ends of the layers of packing 10 will preferably extend sufficiently to form a fluid-tight joint with the inner face of the cylinder-casing 7. Preferably formed integral with the cylinder-casing 7, and extending from the inner face thereof radially with respect to the shaft 5, is a partition or septum 13 the inner face of which is provided with packing material 14 suitably held in position and adapted to bear snugly against the outer face of the sleeve 8 to form therewith a fluid-tight joint, said partition serving to divide the cavity of the cylinder into two compartments.

Mounted on the upper face of the cylinder-casing 7 is an upper head 15 provided with a marginal flange 16 to receive the rabbeted upper edge of the cylinder 7 and form therewith a snug joint in the same manner as has been described with reference to the marginal flange on the lower head 1. The upper head 15 is provided with a plurality of laterally-extending apertured lugs 17, registering with the lugs 3 on the lower head 1, to receive clamping screws 18 the threaded-ends of which engage in the threaded apertures in the lugs 3 for clamping the two heads firmly against the upper and lower edges of the cylinder-casing 7. The upper head 15 is provided with a central aperture in alinement with the aperture in the lower head 1 which receives the shaft 5 and is also provided with a hub or boss 19 which is also provided with a packing gland 20 for forming a fluid-tight joint around the shaft 5. Fixedly secured to the upper

end of the shaft 5 is a tappet 21 provided with two widely separated working faces 22 and 23 for a purpose to be later described.

Mounted on and preferably formed integral with the upper head 15 is a valve chest which embodies an upwardly-extending body-portion 24 in the upper portion of which is a recess 25 surrounded by marginal flanges 26 on which is mounted a cover 27 held in position by hold-fast devices 28. Extending transversely of the recess 25 and radially with respect to the shaft 5 is a semi-circular valve seat 29, communicating with which are two ports 30 and 31 extending from said valve seat to the two compartments of the cylinder and terminating on the opposite sides of the partition 13. The body-portion 24 is further provided with a transverse opening 32 positioned below the valve seat 29 and communicating therewith by means of a passage 33 and having the interior thereof preferably threaded to receive the inner end of a discharge-pipe 34. An inlet 35 communicates with the recess 25, to introduce the operating fluid to the valve chest under pressure. Extending transversely of the valve chest and centrally of the space surrounded by the valve seat 29 is a valve-stem 36, on which is mounted within the recess 25 a valve 37 extending between the two side marginal flanges 26 surrounding the recess 25. The valve is provided with a semi-circular groove to receive the valve-stem and is also provided with two ears 38 which extend upwardly on the opposite sides of the valve-stem 37 and which are secured thereto by a pin or other suitable hold-fast device so as to compel the rotation of the valve in unison with the valve-stem. The under face of the valve 37 is suitably shaped to rotate in the semi-circular valve-seat 29 and its under portion is provided with a wide transverse notch 39 for a purpose to be later described.

Mounted fixedly on the valve-stem between the valve-chest and the shaft 5 is a segmental-link 40 provided with a slot 41 formed in the arc of a circle of which the valve-stem is the center. Loosely mounted on the valve-stem 37 is the lower end of an oscillating lever 42 on the outer end of which is an adjustable weight 43. The lower end of the lever 42 is bifurcated to provide two arms 44 widely divergent and each adapted to encounter a pin 45 projecting from the upper face of the head 15 and so positioned as to encounter the arms 44 in alternation as the lever 42 is oscillated from side to side. Projecting from one face of the lever 42 is a pin 46 so positioned as to travel in the slot 41 of the link 40 and on the opposite side of the lever 42 is a pin 47 so positioned as to be encountered alternately by the faces 22 and 23 of the tappet 21.

The operation of the device is as follows: The lever 42 is oscillated to one side as shown in Fig. 4, by hand, which causes the partial rotation of the valve 37 sufficiently to permit the fluid, which is usually water under pressure, which enters through the inlet-pipe 35 into the recess 25, to pass downwardly through the port 31 into one compartment of the cylinder, on one side of the piston, 9 which forces the piston to make a partial revolution, in doing which it turns the shaft 5 carrying the tappet 21; this movement of the piston continues until one of the working faces 22 or 23 of the tappet 21 encounters the pin 47 on the lever 42, which causes the lever to move sufficiently to oscillate into its opposite position. As the lever 42 is oscillated by means of the tappet 21 the pin 46 projecting from the rear face thereof moving in the slot 41 causes a similar movement of the link 40, the result of which is that the valve 37 will be turned so that the notch 39 is positioned to establish communication between the upper end of the port 31 and the passage 33 and at the same time the upper end of the port 30 will be uncovered to permit the fluid under pressure from the inlet-pipe 35 to pass downwardly into the compartment of the cylinder on the opposite side of the piston, thereby causing a reversal of movement of the piston, in doing which, the fluid, in the first compartment in advance of the piston, is forced upwardly through the port 31, through the passage 33, to the opening 32, and thence escapes by the exhaust-pipe 34. The foregoing movement of the motor will be kept up indefinitely and intermittently by the successive partial rotations of the piston 9 operating through the tappet 21, to oscillate the lever 42, at the end of each stroke of the piston. The lever 42 is prevented from rocking too far by the fact that the arms 44 alternately encounter the pin 45 which constitutes an abutment for limiting the oscillations of this element and thereby prevent the valve 37 from being turned too far in either direction.

I claim:

1. A water motor comprising a cylinder, heads for said cylinder provided with aligned apertures, a shaft mounted in said apertures, a piston secured on said shaft within said cylinder, said piston embodying a blade provided with suitable packing for forming a fluid-tight joint with the inner faces of the heads and the lateral wall of the cylinder, a partition extending from the wall of said cylinder inwardly and operating with said piston to divide the interior of said cylinder into two compartments, a valve-chest mounted on one of said heads and provided with a valve-seat having ports communicating respectively with the two compartments of said cylinder and with inlet and outlet pas-

sages, a valve mounted on said seat, a valve-stem for said valve, an oscillating lever mounted on said valve-stem adapted to actuate said valve to introduce a fluid alternately
5 into the two compartments of said cylinder and cause an intermittent, alternating partial revolution of said piston and shaft, and a tappet carried by said shaft adapted to oscillate said lever for shifting said valve.
10 2. A water motor comprising a cylinder, a shaft extending longitudinally there-through, a piston within said cylinder embodying a radial blade fixedly secured to said shaft and provided with suitable packing,
15 a partition within said cylinder extending from the lateral wall thereof inwardly and operating with said piston to divide the interior of said cylinder into two compartments, a valve-chest mounted on said cylinder
20 and provided with a valve-seat at right angles to said shaft and having ports communicating with the two compartments of

said cylinder and further provided with inlet and outlet passages, a valve mounted on said seat, a valve-stem for said valve arranged radially with respect to said shaft,
25 an arm provided with a circular slot fixedly mounted on said valve-stem, and adapted to shift said valve for introducing a fluid alternately into the two compartments of said
30 cylinder and cause an intermittent, alternate partial revolution of said piston and said shaft, an oscillating lever provided with a pin engaging said slot to oscillate said link for changing the position of said valve and
35 a tappet carried by said shaft serving to oscillate said lever.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN BAUER.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."