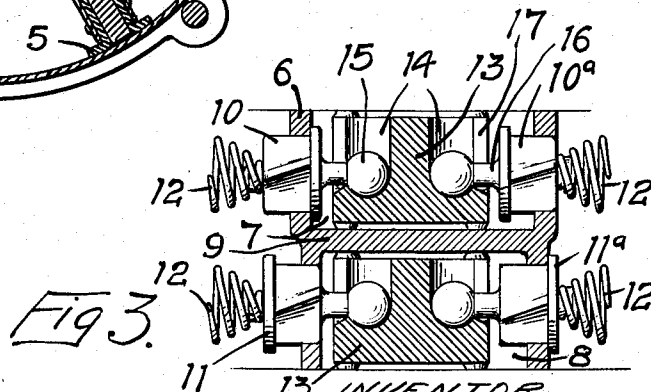
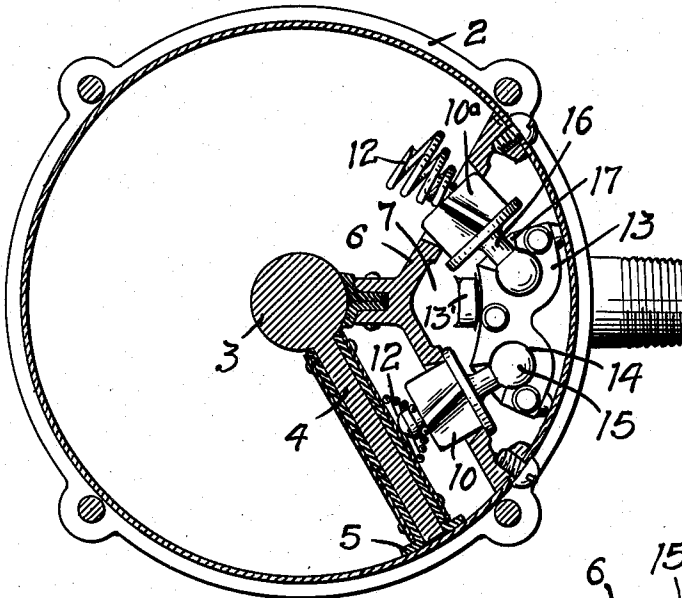
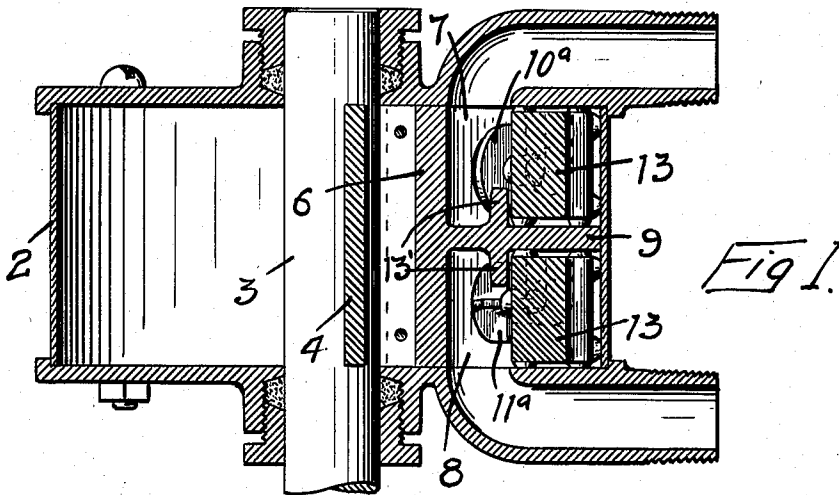


W. C. FAWKES.
WATER MOTOR.
APPLICATION FILED DEC. 28, 1908.

937,060.

Patented Oct. 19, 1909.



WITNESSES
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UNITED STATES PATENT OFFICE.

WILBERT C. FAWKES, OF MINNEAPOLIS, MINNESOTA.

WATER-MOTOR.

937,060.

Specification of Letters Patent.

Patented Oct. 19, 1909.

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To all whom it may concern:

Be it known that I, WILBERT C. FAWKES, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful
5 Improvements in Water-Motors, of which the following is a specification.

My invention relates to water motors, particularly those of the rotary type and the object of my invention is to provide a
10 motor having a longer stroke than usual in machines of this kind.

Most motors of the rotary type are so constructed that the oscillating piston can only describe a little more than half of a revolution. With my apparatus, a stroke in excess
15 of two-thirds is obtained, thereby greatly increasing the efficiency of the motor and its capacity with a given supply of water.

A further object is to provide a valve chamber, having valves arranged to form a square contact with the piston, thereby preventing any possibility of sticking of the valves, due generally to their indirect engagement with the piston.

25 A further object is to provide valves and means connecting them, which will insure their positive uniform movement under the pressure of the piston.

My invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical, sectional view of a rotary motor embodying my invention, Fig. 2 is a horizontal, sectional view at right angles to the section line of Fig. 1, illustrating the manner of mounting the valves in sliding valve blocks.
35 Fig. 3 is a detail sectional view, illustrating the construction and arrangement of the valves.

In the drawing, 2 represents a cylindrical motor casing having a shaft 3 that is suitably connected with the agitating device of the washing machine.

4 is a piston radiating from the shaft 3 and having flexible packing strips 5 at its outer edge adapted to contact with the inner walls of the cylinder.

A casing 6 is arranged within the cylinder between its outer walls and the shaft 3. The interior of this casing is divided into valve chambers 7 and 8 separated from one another
50 by a wall 9. In these chambers valves 10 and 10^a and 11 and 11^a are arranged, each valve

having a coiled spring 12 at its outer end projecting into the path of the oscillating piston. The valves have spirally arranged webs thereon, which when struck by the
60 water flowing through the valves, will cause rotation of the valves and insure the proper seating of them, when they are closed. The valve casing, as indicated in Fig. 2, is segmental in form, its walls coinciding with the
65 radii of the cylinder, this construction allowing me to arrange the valves, so that their outer ends will be nearer the center of the cylinder than their inner ends and the contacting springs will squarely engage the
70 surfaces of the oscillating piston, thus insuring movement of each valve and preventing them from binding or sticking, which frequently happens when the piston strikes the valve at an angle. When the valve on
75 one side of the chamber opens, the corresponding valve on the other side should close. I therefore, provide blocks 13 arranged to slide between the wall of the casing and lugs 13' in said chambers and having sockets
80 14 therein, adapted to receive heads 15 provided on the inner ends of the valves. Necks 16, connecting the said heads with the valves, are adapted to slide in grooves 17 to allow the valves to accommodate themselves to
85 the position of the sliding blocks. It will be understood from an examination of Fig. 2, that these blocks move on the arc of a circle, the valves oscillating in their bearings therein and following the blocks back
90 and forth, as the valves are struck by the swinging piston. I have found, in a device of this kind, that to be successful and practical, each valve must work perfectly. That is, it must open and close freely and when in
95 its closed position, must seat itself and remain seated until again struck by the piston. I have found that by using the sliding block with the valves having ball and socket connections therewith, a positive, uniform movement of each valve is insured and there is no possibility of the valve sticking or being unevenly seated, when closed. Furthermore, this connection allows me to provide a compact valve chamber, bringing the opposite valves close together and insuring a longer stroke for the piston than is possible with motors of this kind, as usually made.

I claim as my invention:

1. In a water motor, a cylinder, an oscillating piston therefor, a valve casing divided into chambers and valves therefor, and

blocks arranged to slide between guides in said chambers and having swiveled connections with said valves substantially as described.

5 2. In a water motor, the combination of the cylinder, of an oscillating piston, a valve casing interposed between the walls of said cylinder and axis of said piston, said casing being segmental in form and having
10 valve chambers therein and valves therefor, said valves having yielding means on their outer ends arranged to contact squarely with the surfaces of said piston, and means
15 loosely connecting the contiguous ends of opposite valves and slidable therewith, within said casing, substantially as described.

3. A water motor, comprising a cylinder, a piston therefor, a valve casing arranged within said cylinder and divided interiorly into
20 valve chambers, valves provided within said chambers, blocks slidable within said chambers and having swiveled connections with said valves.

4. A water motor, comprising a cylinder,
25 an oscillating piston therefor, a valve casing interposed between the walls of said cylinder and the axis of said piston and

having valve chambers, of valves arranged in said chambers, blocks slidable in said chambers and having sockets therein to receive
30 heads provided on the inner ends of said valves, and said blocks having slots to receive the reduced portions of said heads and said reduced portions sliding in said slots
35 to allow said valves to accommodate themselves to the direction of movement of said blocks.

5. A rotary water motor, comprising a cylinder, an oscillating piston therefor, a valve casing interposed between the walls
40 of said cylinder and the axis of said piston and divided interiorly into valve chambers, valves arranged in said chambers, sliding means forming a swiveled connection between the valves on opposite sides of said
45 casing and allowing said valves to square themselves with the contacting surfaces of the piston, substantially as described.

In witness whereof, I have hereunto set my hand this 14th day of December 1908.
50

WILBERT C. FAWKES.

Witnesses:

RICHARD PAUL,
J. A. BYINGTON.