

J. N. HIPKINS AND F. C. COSS.

WATER MOTOR.

APPLICATION FILED FEB. 6, 1919.

Patented Aug. 3, 1920.

2 SHEETS—SHEET 1.

1,348,800.

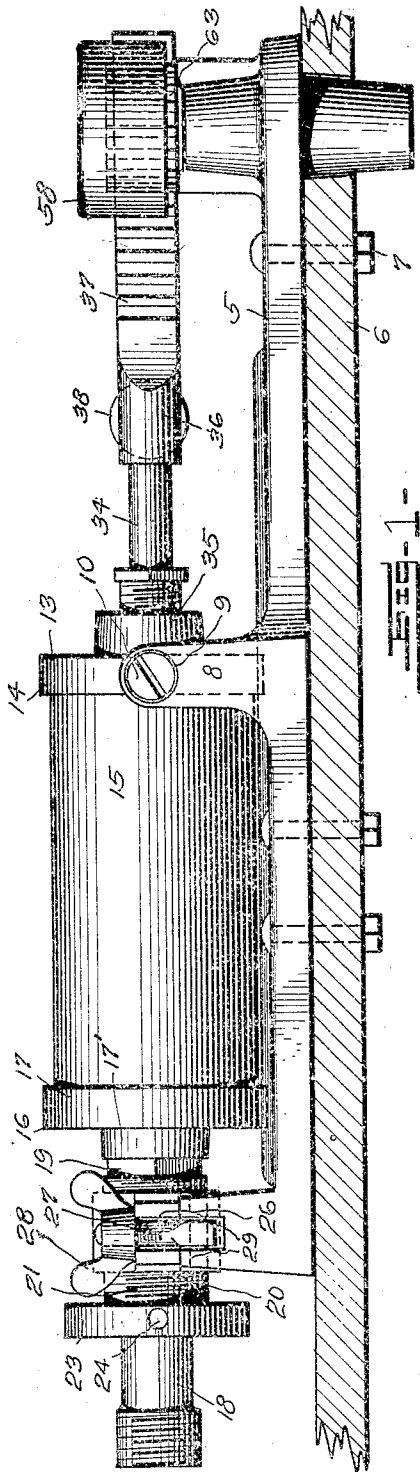


Fig. 1-

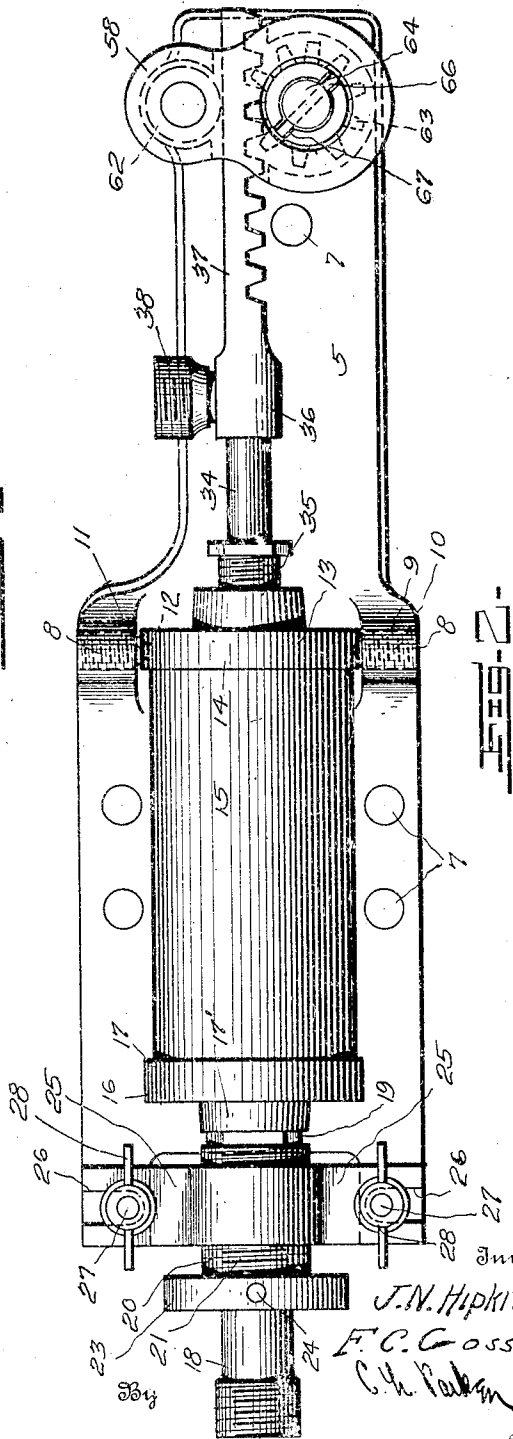


Fig. 2-

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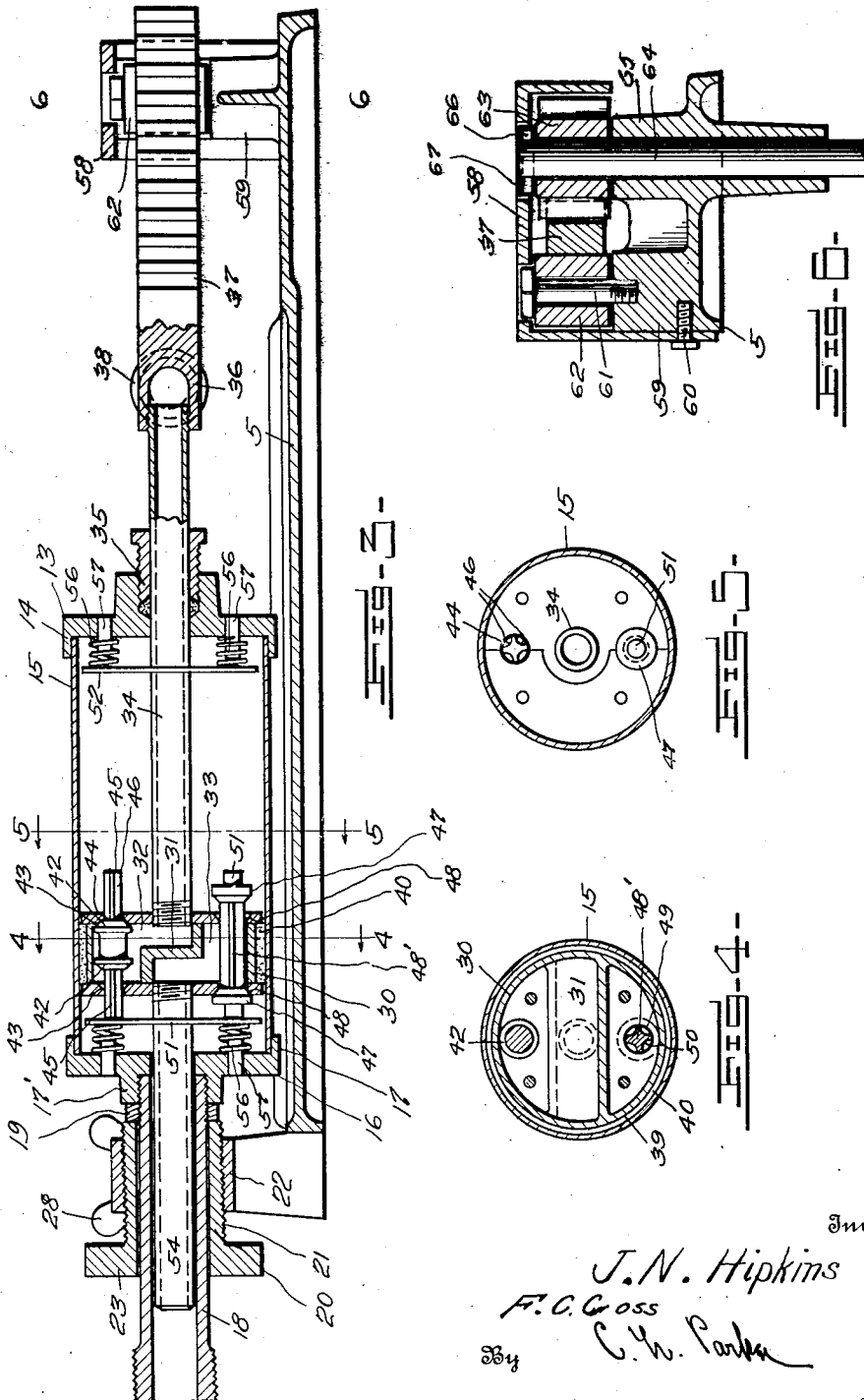
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UNITED STATES PATENT OFFICE.

JESSE N. HIPKINS, OF WHEELING, WEST VIRGINIA, AND FRANK C. COSS, OF MARTINS FERRY, OHIO.

WATER-MOTOR.

1,348,800.

Specification of Letters Patent.

Patented Aug. 3, 1920.

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To all whom it may concern:

Be it known that we, JESSE N. HIPKINS and FRANK C. COSS, citizens of the United States, residing at Wheeling and Martins Ferry, in the counties of Ohio and Belmont and States of West Virginia and Ohio, have invented certain new and useful Improvements in Water-Motors, of which the following is a specification.

10 Our invention relates to improvements in water motors, adapted for use in operating washing machines or the like, while not necessarily restricted to such use.

15 An important object of the invention is to provide a water motor of the above mentioned character, which is of simplified construction, and is formed in parts which are readily separable so that access may be conveniently had to the interior thereof for replacing the valve shifting springs and the piston packing.

20 A further object of the invention is to provide a water motor of the above mentioned character, so constructed that it may be repaired by the ordinary housewife.

25 Other objects and advantages of the invention will be apparent within the course of the following description.

30 In the accompanying drawings forming part of this specification and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a side elevation of a water motor embodying our invention;

35 Fig. 2 is a plan view of the same;

Fig. 3 is a central vertical longitudinal sectional view through the same;

Fig. 4 is a transverse sectional view, taken on the line 4—4 of Fig. 3;

40 Fig. 5 is a similar view, taken on the line 5—5 of Fig. 3; and,

Fig. 6 is a similar view, taken on the line 6—6 of Fig. 3.

45 In the drawings, wherein for the purpose of illustration is shown the preferred embodiment of our invention, the numeral 5 designates a base, adapted to be bolted or otherwise rigidly secured to a support 6, as shown at 7. The support 6 may be the top of a washing machine or the like.

50 The base 5 is provided between its ends with a pair of up-standing knuckles 8, which have screw threaded openings 9, receiving screw threaded pivot elements 10, the inner ends 11 of which are reduced and smooth,

for pivotal reception within recesses or notches 12, formed in a forward head 13 of the motor. This head 13 is therefore pivotally supported to turn in a vertical plane. The head 10 is provided near its periphery 60 with an annular flange 14, receiving a cylinder 15. This cylinder is an integral unit, and has its opposite ends open, as shown. Arranged at the opposite end of the cylinder 15 is a rear head or end 16, having an annular flange 17 at its periphery receiving the rear end of the cylinder 15. The ends of the cylinder 15 form a water-tight joint with the flanges 14 and 17, but the cylinder is readily separable from these flanges. 70

As more clearly shown in Fig. 3, the rear end 16 is provided with an annular coupling 17, receiving and having screw threaded engagement with the forward end of a relatively stationary outlet pipe 18, these parts being held against displacement by a lock nut or ring 19. The outlet pipe 18 is slidably mounted within a longitudinally adjustable sleeve bearing 20, exteriorly screw threaded, as shown at 21, to engage within a screw threaded bearing 22. The adjustable sleeve bearing 20 has its outer end provided with a disk or head 23, having openings 24 formed therein, as clearly shown in Fig. 1, for receiving a rod or the like to turn the same. The bearing 22 is preferably provided upon its opposite sides with horizontal bars 25, as shown in Fig. 2, having longitudinal openings or slots 26, receiving bolts 27, carrying winged nuts 28. These winged 90 nuts are pivoted in the upper forked ends of knuckles 29, as clearly shown in Fig. 1. It is thus seen that means are provided to detachably clamp the bearing 22 with the knuckles 29 and base 5. 95

Mounted to reciprocate within the cylinder 15 is a piston 30, which is hollow, and provided with a transverse partition 31 forming an inlet chamber 32 and an outlet chamber 33. A tubular piston rod 34 is 100 connected with one end of the piston 30, and leads into the chamber 32. This piston rod extends through a stuffing box 35, formed upon and carried by the head 13. The forward end of the tubular piston rod has screw threaded engagement with a hollow coupling 36, carried by a rack-bar 37. This hollow coupling has a lateral screw threaded coupling element 38, serving as an inlet for the water and adapted for engagement with 110

a hose or the like. The piston 30 is provided upon its periphery with an annular groove or recess 39, receiving a packing strip or ring 40, which may be formed of leather, rubber or the like.

Arranged within the chamber 32 is a double ended inlet valve, having valve elements 42, to alternately engage with valve seats 43. These valve seats are formed at or near openings 44. The valve 41 is carried by a valve stem 45, mounted to reciprocate within the openings 44. These valve stems, as shown in Fig. 5, have exterior grooves or passages 46. The numeral 47 designates exhaust valves, arranged near and exteriorly of the exhaust chamber 33, and adapted to contact with valve seats 48, forming openings which lead to the chamber 33. The valves 47 are carried by a valve stem 48', slidably mounted within openings 49. As clearly shown in Fig. 4, the valve stem 48' is provided with exterior grooves 50. The valves 47 carry extensions 51, as shown.

Arranged within the ends of the cylinder 15 are valve shifting plates 51 and 52. The plate 52 has a central opening slidably receiving the tubular piston rod 34, while the plate 51 has a central opening, slidably receiving an outlet tube 54, having screw threaded engagement with the piston 50 and leading into the chamber 33. The outlet tube 54 is slidably arranged within the outlet pipe 18. The plates 51 and 52 engage compressible coil springs 56, carried by studs 57 and are adapted to be removed therefrom, but fit sufficiently snug thereon to prevent accidental displacement. The studs 57 are suitably anchored to the heads 13 and 16.

The rack-bar 37 operates through a guard casing 58, which is secured to a lug 59, formed integral with the base 5, as shown at 60. The lug 59 is connected with a bolt 61, having a roller 62 rotatable thereon, this roller contacting with the outer side of the rack-bar. The rack-bar engages a pinion 63, having an opening to receive a vertical shaft 64. This vertical shaft operates through a bearing 65, preferably formed integral with the base 5. The shaft 64 is provided at its upper end with a transverse member or key 66, fitting within openings or notches 67 formed upon the upper end of the pinion 63. It is thus seen that the pinion 55 is locked to the shaft 54 to drive it.

The operation of the apparatus is as follows:

With the parts in the position shown in Fig. 3, the piston has traveled to the left for the limit of its stroke, and the valve 41 is shifted to the right with respect to the piston 30, and the valves 47 are also shifted to the right with respect to the piston. The water under suitable pressure 65 passing through the tubular piston rod 34,

enters the chamber 32, and discharges through the opening 44 to the left, thereby entering the left end of the cylinder. As the valve 47 to the left is closed, the piston will be moved to the right, and the water in the right end of the cylinder will pass through the opening 48 to the right, chamber 33, and through exhaust tube 54. When the piston has reached the end of its travel to the right the valves are shifted to the left with respect to the piston. The incoming water discharging through the tubular piston rod 34 enters the chamber 32 and into the right end of the cylinder, to move the piston to the left, the water in the left end of the cylinder now exhausting through the tube 54.

By having the bearing 22 removable by unscrewing the thumb nuts 28 and swinging them down, the head 16 may be readily separated from the cylinder. The head 16 normally contacts with the base 5, for providing a steady or rigid construction, and by having the cylinder pivoted at its forward end the head 14 may be readily removed from the cylinder as it will clear the base. This swinging movement also permits of the convenient movement of the cylinder 15 from the other head 13, thereby exposing the piston. By turning the sleeve-bearing 20, it is longitudinally adjusted and contacts with the nut 19, whereby the cylinder is clamped in the desired position. With the parts separated as indicated, the springs 56 and the packing 40 may be readily renewed by the ordinary housewife.

It is to be understood that the form of our invention herein shown and described is to be taken as the preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having described our invention, what we claim is:—

1. A water motor of the character described, comprising a base, a head pivotally connected with the base, a cylinder having detachable engagement at one end with the head, a second head detachably engaging the opposite end of the cylinder, an outlet pipe connected with the second named head, an externally threaded sleeve receiving the outlet pipe, an internally threaded bearing receiving said sleeve and detachably connected with the base, a piston mounted within the cylinder, and means whereby fluid pressure introduced into the cylinder causes the reciprocation of the piston.

2. A water motor of the character described, comprising a base, a head connected with the base, a cylinder having detachable engagement at one end with the head, a second head detachably engaging the oppo-

site end of the cylinder, an outlet tube connected with the second head, a bearing having detachable engagement with the base, a sleeve bearing longitudinally adjustably mounted within the first named bearing to contact with the second named head and receiving the outlet tube, a piston mounted to reciprocate within the cylinder, and means whereby fluid pressure introduced into the cylinder causes the reciprocation of the piston.

3. A water motor of the character described, comprising a base, a head connected with the base, a cylinder having detachable engagement at one end with the head, a second head detachably engaging the opposite end of the cylinder, an outlet tube connected with the second head, a bearing having detachable engagement with the base, a sleeve bearing having screw threaded engagement within the first named bearing and adapted to contact with the second named head and receiving the outlet tube, a piston arranged within the cylinder, and means whereby fluid pressure introduced within the cylinder causes the reciprocation of the piston.

4. A water motor of the character described, comprising a base, a cylinder arranged above the base, a head connected with one end of the cylinder, means piv-

otally connecting the head with the base, a second head detachably connected with the opposite end of the cylinder, detachable means to lock the second head to the base, a piston mounted to reciprocate within the cylinder, and means whereby fluid pressure introduced into the cylinder causes the reciprocation of the piston.

5. A water motor of the character described, comprising a base, a cylinder arranged above the base, a head detachably connected with one end of the cylinder, means pivotally connecting the head and base, a second head detachably connected to the opposite end of the cylinder, a member connected with the base and adapted to be moved longitudinally thereof into clamping engagement with the second named head, a piston mounted to reciprocate within the cylinder, and means whereby fluid pressure introduced into the cylinder causes the reciprocation of the piston.

In testimony whereof we affix our signatures in presence of two witnesses.

JESSE N. HIPKINS.
FRANK C. COSS.

Witnesses:

FRANK A. SEDGWICK,
CHARLES MILLS.