

J. SCHROEDER.

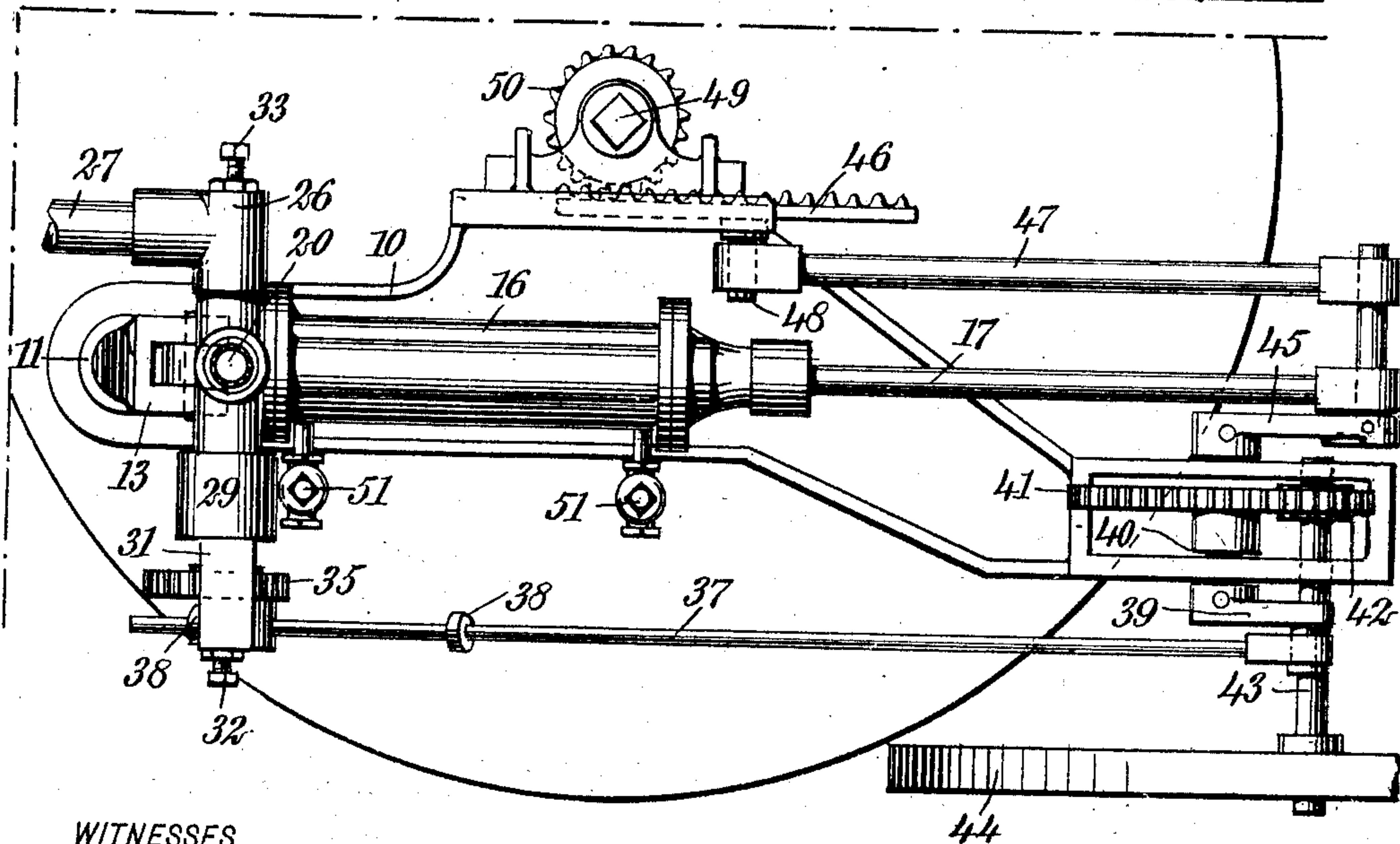
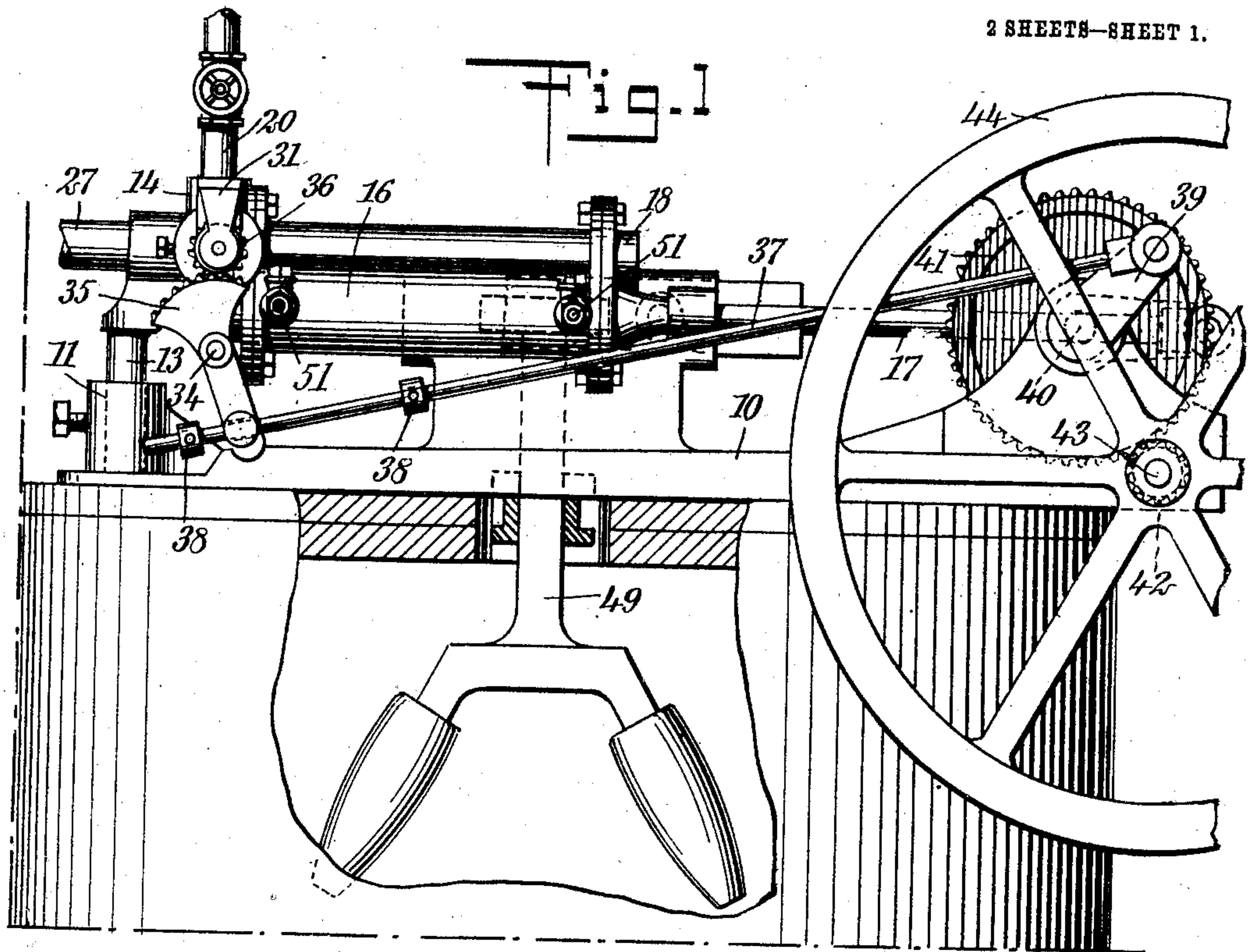
MOTOR.

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908,890.

Patented Jan. 5, 1909.

2 SHEETS—SHEET 1.



WITNESSES

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JOHN SCHROEDER, OF DAVENPORT, IOWA.

MOTOR.

No. 908,890.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed April 3, 1908. Serial No. 424,954.

To all whom it may concern:

Be it known that I, JOHN SCHROEDER, a citizen of the United States, and a resident of Davenport, in the county of Scott and State of Iowa, have invented a new and Improved Motor, of which the following is a full, clear, and exact description.

This invention is an improvement in motors of the character described in Letters Patent Number 873,619, granted to me December 10, 1907, wherein the actuating agent is ordinarily water, but may if desired be other motive fluids such as steam, air, etc.

The invention has for its purpose the provision of a motor embodying in its construction an oscillatory cylinder provided with a working piston, and having valve-controlling means for alternately admitting and exhausting the motive fluid to and from the cylinder at opposite sides of the piston, the valve being preferably actuated from the piston through the usual driving shaft by a segmental gear in mesh with a pinion fixed to the valve and provided with a radial arm through which a valve-rod is slidable, having stop collars.

The invention further contemplates the adoption of check-valves at or near opposite ends of the cylinder for the admission of air when water is used as a motive agent, by which the exhaust of the water from the cylinder is easily effected, giving the motor a smooth regular motion and at the same time admitting of the closing of the valve earlier, and an economical use of the actuating fluid.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the preferred embodiment of my improved motor as applied to a washing machine, the latter being shown partly in section; Fig. 2 is a plan of the construction shown in Fig. 1; Fig. 3 is a central vertical longitudinal section through the cylinder; Fig. 4 is a rear end elevation of the motor, showing the valve-rod in section; Fig. 5 is a vertical section through the controlling valve; Fig. 6 is a vertical section through the valve, showing it in a different position from that shown in Fig. 3; and Fig. 7 is a perspective view of the valve.

I have shown the motor applied to a washing machine, in which relation it is especially adapted to be used, although I recognize

that it can be employed satisfactorily for power purposes in general. The motor embodies in its construction a base 10 preferably having edge flanges for strengthening purposes, offset at its forward end, and provided at its rear end with a vertical socket 11. In this socket is adjustably secured by suitable means, as a set-screw 12, a post 13 having its upper end bifurcated for receiving the projecting portion of a valve-casing 14 to which it is pivotally connected by a pin or bolt 15. The valve-casing 14 is rigid with and forms the rear head of a cylinder 16 which has the usual working piston 17, the rod of which passes through the forward cylinder head 18 and the stuffing-box 19 secured thereto.

Leading into the valve-casing 14, preferably at its top, is a supply pipe 20 which connects through ports 21 and 22 respectively with the rear end of the cylinder and the forward end of the same at the front of the piston, this last mentioned port, as best shown in Fig. 3, being formed not only in the valve-casing 14 but also in the walls of the cylinder and the inner face of the front cylinder head 18. At the intersection of the ports 21 and 22, a controlling-valve 23 is horizontally and revolvably mounted in the valve-casing, and is in the nature of a conical plug cut away at its periphery for approximately a semi-circumference at the point of its length in a plane with the ports, as indicated at 24, and is further cut out at the opposite side to provide a slot 25 leading through its smaller end and discharging into an elbow 26 threaded to the valve-casing, and to an exhaust pipe 27. At the opposite side of the valve-casing the stem of the valve 23 passes through a stuffing-box 28 and through a cup 29 enveloping said box, and is adjustably secured thereto by a screw 30. This cup has an arm 31 rigid therewith and provided with an offset portion through which is threaded a set-screw 32, which, in connection with a like screw 33 threaded through the elbow 26, serves to adjust the valve 23 in the casing with such exactness that the least possible friction will be developed when a fluid-tight joint is secured.

The end or cover of the cup 29 is extended at its lower side, in which is carried a pin 34, providing a bearing for a segmental gear 35, the latter being in mesh with a pinion 36 fixed to the stem of the valve 23. The segmental gear 35 has a radial arm at its opposite side, through which is slidable a valve-

rod 37, the said rod being provided with adjustable stop collars 38 fixed at the opposite sides of the arm of the gear, and is journaled at its forward end on the pin of a crank 39 5 carried by the driving shaft 40, the latter being journaled in the raised edge flanges of the offset portion of the base 10 hereinbefore referred to. Between these flanges a gear 41 is fixed to the driving shaft in mesh with 10 a gear 42 fixed to a driven shaft 43, which in turn carries a fly-wheel 44. Also fixed to the driving shaft is a crank 45 having the usual pin on which the piston rod 17^a is journaled. This pin also serves to operatively 15 connect a rack 46 through a connecting rod 47, the rack having a pin 48 projecting from its rear face for this purpose. The rack is slidably supported in suitable ways carried by the base, the walls of which are extended 20 to provide bearings for a vertical shaft 49 extending into the tub, as shown in Fig. 1, where it is constructed with the usual agitating arms. These arms are revolved back and forth from the rack by a pinion 50 in 25 mesh therewith and secured to the shaft 49.

At or near each end of the cylinder is a check-valve 51, which is set to open as a suction is created in the cylinder at the opposite sides of the piston when the latter is reciprocated. 30

In the operation of the motor, assuming the parts to be in the position illustrated in Fig. 3, the water or other actuating fluid under pressure passes from the supply pipe into 35 the valve-casing, and is enforced by the controlling-valve to pass through the port 22 to the front of the piston. As the piston travels rearwardly a quantity of air is taken in through the forward check-valve, and the 40 fluid at the rear of the piston is expelled through the port 21 and exhaust slot of the valve into the exhaust pipe 27. When the piston approaches the limit of its back stroke,

the forward collar on the valve-rod strikes the radial arm of the segmental gear, and by 45 it and the intermeshing pinion, revolves the valve to the position shown in Fig. 6, thus cutting off the motive fluid from the port 22 and placing the same in communication with the exhaust slot of the valve and simultane- 50 ously connecting the supply pipe with the port 21. The piston as it travels forward likewise draws in a quantity of air through the rear check-valve, which I have found to be an important factor in the smooth and 55 regular running of the motor, and to also enable the cut-off of the water supply to take place earlier, that is, before the completion of the stroke of the piston, which obviously economizes the actuating fluid employed. 60

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. The combination of a base having a socket, a post adjustable in the socket, a cyl- 65 inder having a working piston, a valve-casing pivotally supported on the post, forming the head of the cylinder and rigidly connected therewith, a valve for controlling the admission and exhaust of the motive agent to and 70 from the cylinder, and means operated by the piston for actuating the valve.

2. The combination of a base, a post vertically adjustable on the base, a cylinder pivotally supported on the post and having a 75 working piston, a valve controlling the admission and exhaust of the motive agent to and from the cylinder, and means for actuating the valve from the piston.

In testimony whereof I have signed my 80 name to this specification in the presence of two subscribing witnesses.

JOHN SCHROEDER.

Witnesses:

C. A. LUDOLPH,
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