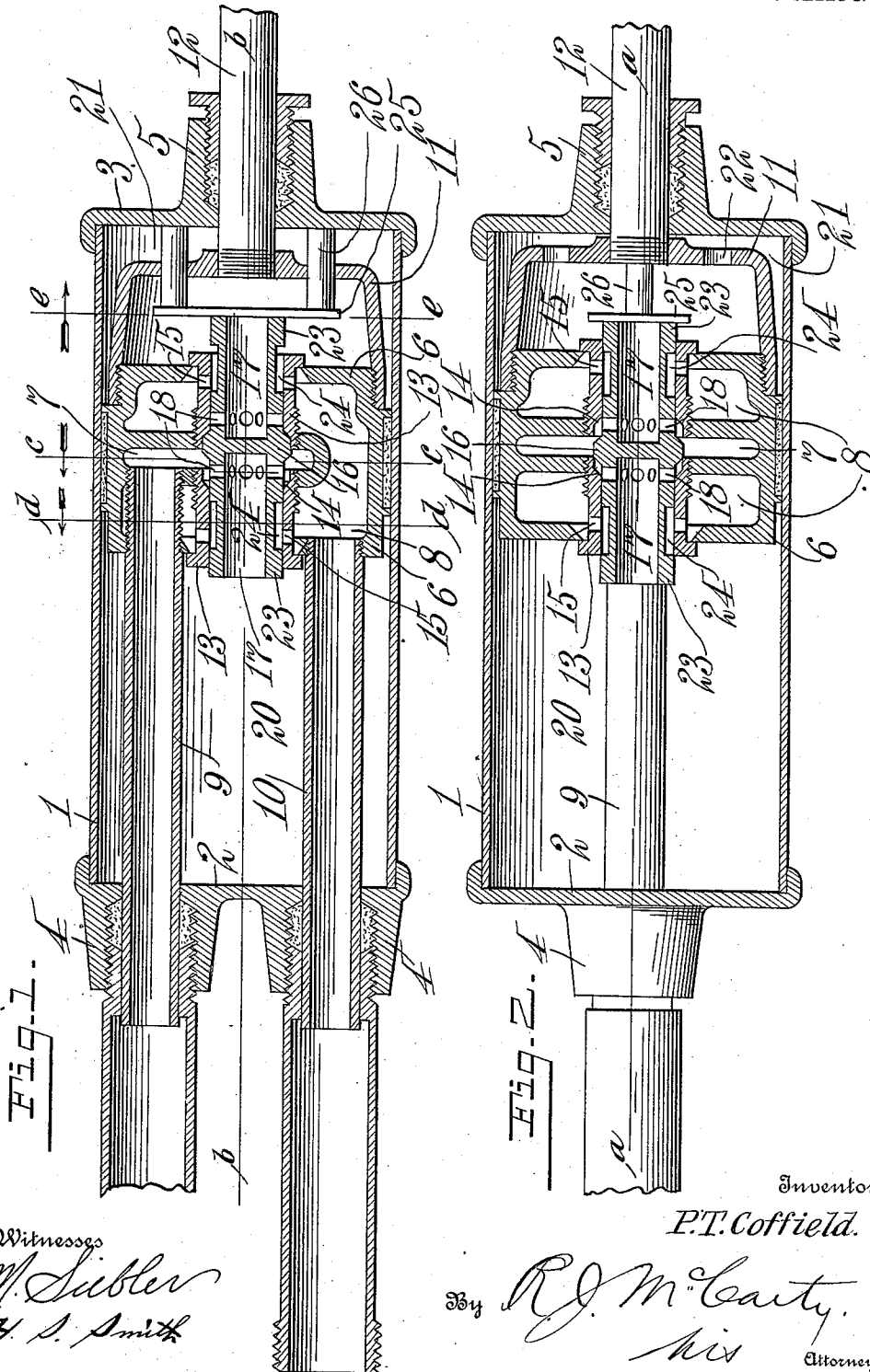


P. T. COFFIELD.
WATER MOTOR.
APPLICATION FILED JUNE 12, 1911.

1,041,242.

Patented Oct. 15, 1912.

2 SHEETS-SHEET 1.



Witnesses
M. S. L. S. L.
H. S. Smith

Inventor
P. T. Coffield.
By R. J. McCarty.
his Attorney

P. T. COFFIELD.
WATER MOTOR.
APPLICATION FILED JUNE 12, 1911.

1,041,242.

Patented Oct. 15, 1912.

2 SHEETS-SHEET 2.

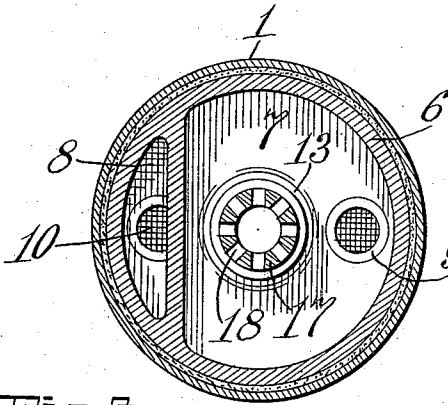


Fig. 3.

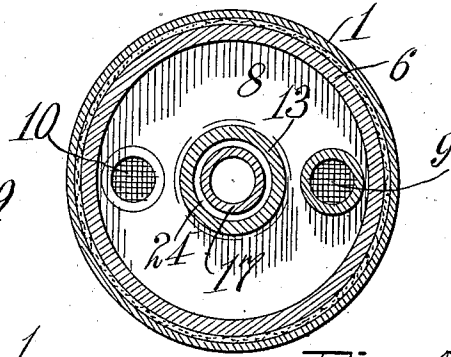


Fig. 4.

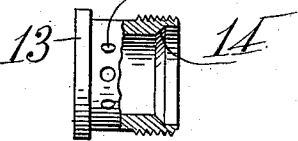
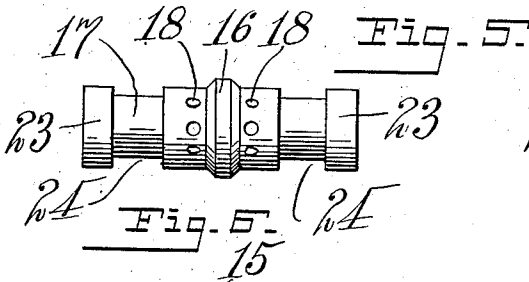
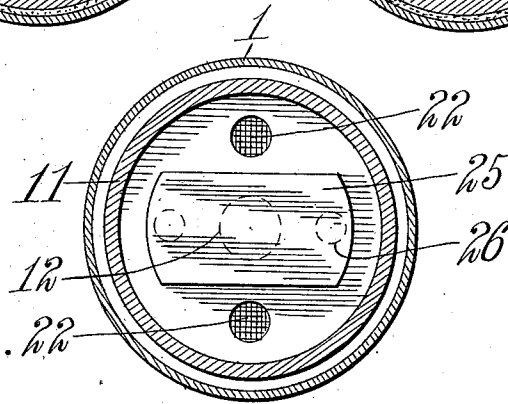


Fig. 7.

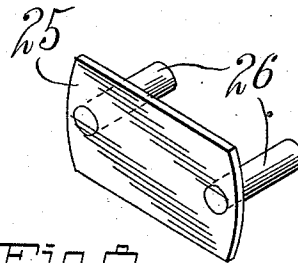


Fig. 8.

Witnesses
M. S. Sibley
H. L. Smith

Inventor
P. T. Coffield.

By *R. J. M. Canty*
his Attorney

UNITED STATES PATENT OFFICE.

PETER T. COFFIELD, OF DAYTON, OHIO, ASSIGNOR TO THE COFFIELD MOTOR WASHER CO., OF DAYTON, OHIO, A CORPORATION OF OHIO.

WATER-MOTOR.

1,041,242.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed June 12, 1911. Serial No. 632,594.

To all whom it may concern:

Be it known that I, PETER T. COFFIELD, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Water-Motors; and I do declare the following to be a full, clear, and exact description of the invention, 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, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in water motors.

The object of said invention is to employ a compound valve through which the inlet and exhaust is controlled, and to mount said valve in the axis of the piston. In thus locating the valve in the center of the piston, a valve of large area may be employed and great freedom is offered to the flow of water through the chambers of the piston, while the diameter of the piston and consequently that of the cylinder, is kept to a minimum. Where motors of this type are generally used, the supply of water is limited, therefore to maintain the proper speed and length of stroke, it is essential that the size of the cylinder shall not be too large.

Referring to the accompanying drawings, Figure 1 is a longitudinal horizontal sectional view of the motor on the line *a-a* of Fig. 2; Fig. 2 is a longitudinal vertical sectional view on the line *b-b* of Fig. 1; Fig. 3 is a section on the line *c-c* of Fig. 1; Fig. 4 is a section on the line *d-d* of Fig. 1; Fig. 5 is a section on the line *e-e* of Fig. 1; Fig. 6 is a detail view of the valve; Fig. 7 is a partial sectional view of one of the valve bushings; and Fig. 8 is a perspective view of the abutment which initially moves the valve in one direction.

Referring more particularly to the drawings, 1 designates the motor cylinder inclosed at its ends by heads 2 and 3, the former containing two stuffing boxes 4 through which the inlet and exhaust pipes 9 and 10 pass from the inlet and exhaust chambers in the piston 6. The piston rod 12 passes through the stuffing box in the other head and engages a yoke 11 secured to the piston. These several elements will be again referred to. The piston 6 has

inlet and exhaust chambers 7 and 8 respectively and an axial opening or bore extending entirely through it. Within this central bore of the piston are two valve bushings 13 on each side of the inlet chamber 7. The bodies of these bushings are provided with ports which communicate with the exhaust chamber, and the inner ends of said bushings are provided with valve seats 14 which lie on opposite sides of the inlet chamber. Mounted within these bushings which form a coöperate casing therefor, is a compound valve which controls the inlet and exhaust chambers of the motor. The central body portion of this member constitutes an inlet valve 16 which lies within the inlet chamber 7 and alternately coöperates with the seats 14 in controlling the admission of the motive fluid. The tubular extensions 17 of this valve member are provided with two series of admission ports 18 which alternately establish communication between the inlet chamber 7 and the cylinder chambers 20 and 21 through the interior of said extensions. And further, the said tubular extensions of the valve member are reduced circumferentially to provide passageways 24 through which communication is established alternately between the cylinder chambers 20 and 21 and the exhaust chamber 8, through the bushing ports 15. In this connection, the ends of the tubular extensions combine with the adjacent portions of the bushings in forming exhaust valves 23. The valve member extends beyond the bushings, and at one end of the piston travel the head 2 forms an abutment to shift said valve member. At the other end an abutment 25 performs this function. This latter valve-operating member is carried on the yoke 11 by means of pins 26 which pass freely through openings in said yoke. As the piston approaches this end of the cylinder, the pins 26 engage the adjacent cylinder head and cause the abutment member 25 to engage the valve and impart thereto a movement similar to that given it at the other end of the cylinder. Thus there is alternately established through the medium of this compound valve, communication between the cylinder chambers 20 and 21 and the inlet and exhaust chambers in the piston, whereby the piston reciprocates throughout its operation.

I do not claim herein the compound valve

through which the inlet and exhaust take place as this is the subject-matter of certain of the claims of my co-pending applications, Serial Number 598,068, filed December 19, 1910, and 632,592, filed even date herewith.

5 Having described my invention, I claim:

1. In a water motor, the combination with a cylinder, of a piston having inlet and exhaust chambers and an axial opening therein, hollow rods communicating with said inlet and exhaust chambers, a compound valve mounted in the axial opening of the piston and controlling the inlet and exhaust, and abutments adapted to engage the ends of said valve to seal the same and to impart initial movements thereto, the final movements being imparted by the water pressure acting on the valve after said initial movements.

20 2. In a motor of the type specified, the combination with a cylinder having inclosing heads, of a piston having inlet and exhaust chambers and an axial opening, a frame attached to one side of said piston, a piston rod attached to said frame, a compound valve mounted in the axial opening of said piston and adapted to alternately admit motive fluid to opposite sides of the piston and to alternately establish communication between the opposite sides of the piston and the exhaust chamber, said valve being adapted to be engaged on one side of the piston by one of the cylinder heads to be

sealed and started from its seat thereby and an actuator on the other side of the piston and carried thereby, said last named actuator, through the medium of the other cylinder head, being adapted to engage said valve to seal and start it in the other direction, substantially as specified.

3. In a motor of the type specified, the combination with a motor cylinder and heads, of a piston having inlet and exhaust chambers and an axial opening, a valve mounted in said axial opening and adapted to be engaged to seal and start the valve in one direction by contact with one of the cylinder heads to admit motive fluid to drive the piston in one direction, a yoke attached to the other side of the piston, a piston rod secured to said yoke, and a valve actuator interposed between the said yoke and the adjacent end of the valve, said actuator being slidably supported on said yoke by means of pins which are adapted to engage the adjacent cylinder head, whereby said actuator engages said valve to seal and start the valve to admit the motive fluid to drive the piston in the other direction.

In testimony whereof I affix my signature, in presence of two witnesses.

PETER T. COFFIELD.

Witnesses:

R. J. McCARTY,
MATTHEW SEIBLER.

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