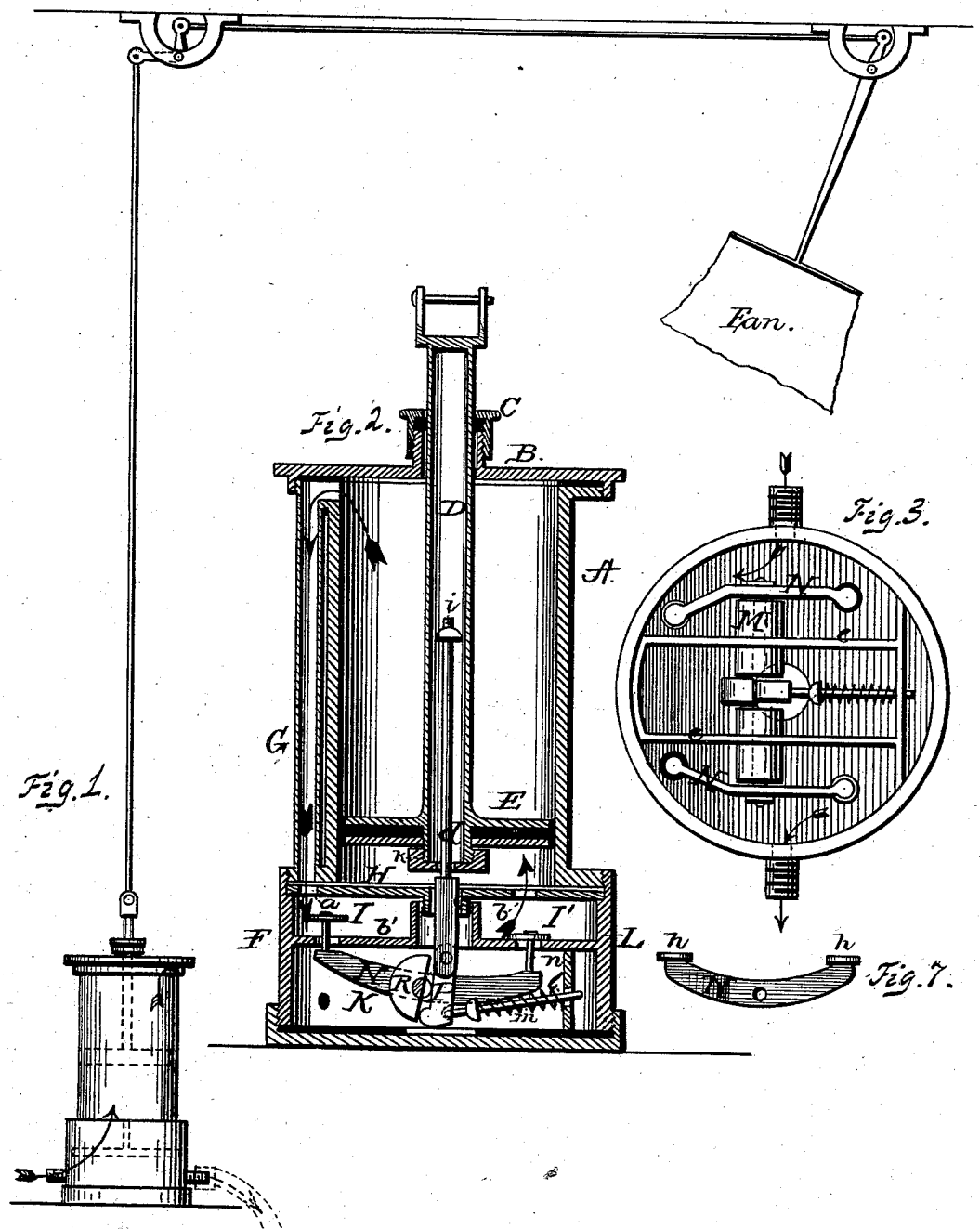
2 Sheets—Sheet 1.

J. A. MYERS.

Hydraulic-Motor.

No. 223,943. **Patented Jan. 27, 1880.**



WITNESSES

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2 Sheets—Sheet 2.

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Fig. 4.

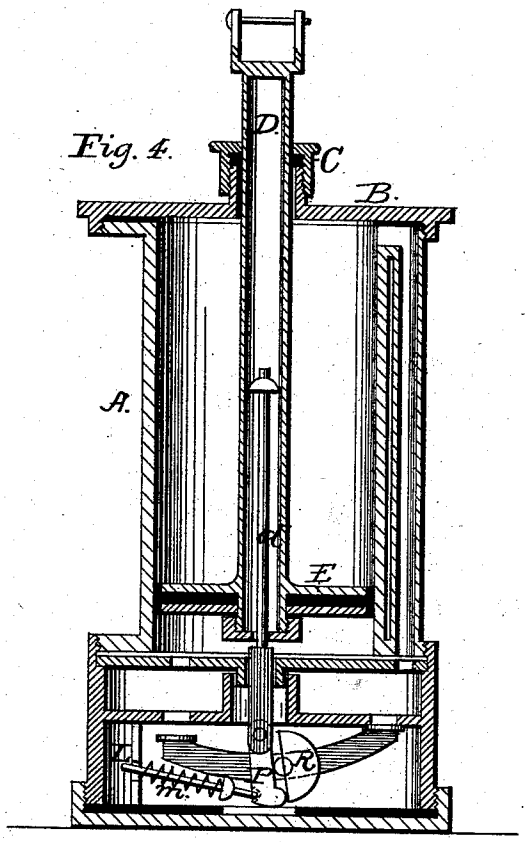


Fig. 5.

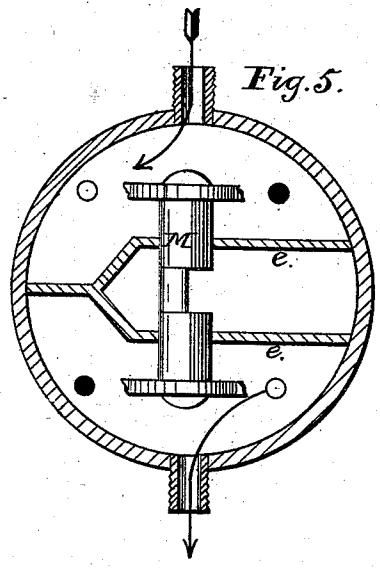
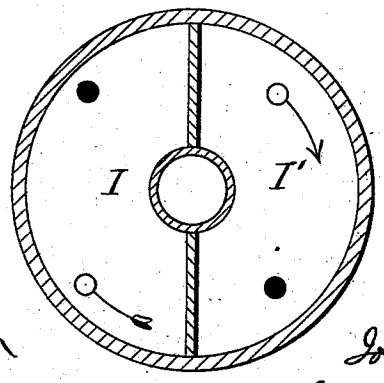


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN A. MYERS, OF LOUISVILLE, KENTUCKY.

HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 223,943, dated January 27, 1880.

Application filed January 2, 1880.

To all whom it may concern:

Be it known that I, JOHN A. MYERS, of Louisville, in the county of Jefferson and State of Kentucky, have invented new and valuable Improvements in Hydraulic Motors; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of the motor operating a fan. Fig. 2 is a central sectional view of the motor. Fig. 3 is a bottom view of the valve-box. Fig. 4 is a central sectional view of the motor, showing the valves in another position. Fig. 5 is another bottom view of the valve-box. Fig. 6 is a plan view of the ante-water-chambers. Fig. 7 is a detail view of the double valve.

This invention relates to that class of hydraulic motors for operating light machinery; and the main object is to produce a compact, effective, and cheap hydraulic engine that can be conveniently located for operating the fan or fans in dining-rooms in the warm season, or driving sewing-machines, turning-lathes, and the like.

The invention consists in means for automatically operating the valves.

It also consists in connecting the two sets of valves by means to insure their simultaneous movements in the operation of the piston.

It also consists in the novel combination of the parts, as will be hereinafter more fully set forth.

In the annexed drawings I have shown the engine operating a fan in a dining-room.

The letter A represents a cylinder; B, the upper cylinder-head with central opening; C, the stuffing-box; D, the hollow piston-rod; E, the piston-head, suitably packed; and F, the valve-box.

The letter G indicates a pipe suitably secured and arranged alongside of the cylinder, forming the water-communication within the cylinder above the piston-head. The upper portion of the cylinder, above the piston, is charged with water, and the same discharged through this pipe G. It will be noticed that this pipe is connected to the upper surface of the valve-box and registers with the opening *a* thereof. (See Fig. 2 of the drawings.)

By means of the floor or horizontal partition *b'* the valve-box F is divided into two stories, the lower story containing the valve-operating mechanism and the upper story water-chambers and spaces for the button-valves.

The circular plate H, closely fitting the lower end of the cylinder and resting upon a ledge at the upper end of the valve-box F, forms the lower head to the cylinder, and is provided with two water-passage ways or ports, *a b*. The passage-way *a* establishes the communication from the water-chamber I to the pipe G, and the passage-way *b* establishes the communication from the chamber I' to the under side of the piston-head. This plate is also provided with a central opening and flange, *c*, through which the piston *d*, carrying at its lower end the operating valve device, passes, the flange serving as a guide. The valve-chamber K is also divided into two water-compartments by means of the vertical partitions *e*, (see Fig. 3,) and one compartment is provided with charge-openings and the other compartment with discharge-openings, arranged in the top wall of the chamber, and induction and eduction passages arranged on the sides.

Within the compartments of the valve-chamber is arranged, at one side of the center and at right angles to the charge and discharge ports, a shaft, M, suitably journaled, so as to be capable of an oscillating motion. To the outer ends of this shaft are secured the double valve-arms N, provided at their upper ends with the valves *h*. These valves are so arranged in their respective chambers that when one is opened, admitting water to its proper passage, the valve directly opposite in the other valve-chamber is closed, but the valve arranged on the opposite end of the other arm is opened, allowing the discharge. (See Fig. 5.)

The ante-water-chambers I I' are separated from each other by means of a partition arranged at right angles to the chambers in the valve-chambers, and are each provided with the charge and discharge passage-ways or ports forming the communications with the upper and lower surfaces of the cylinder, there-

by charging and discharging the water alternately.

The piston *d*, for operating the valves, fits within the hollow piston-rod, and is provided at its upper end with an adjustable nut, *i*, and in connection with the screw-threaded cap *k*, attached to the lower end of the hollow piston-rod D, acts as coupling means. The lower end of the piston *d* is provided with a pivoted wedge-shaped block, P, acting against the inclined face of the member or arm R, attached to the shaft carrying the valves. The lower end of this block or member P is notched or recessed to receive one end of the rod *l*, encircled by the spring *m*, for the purpose of keeping the member P in contact with the member R and pressing it to the face of the member P with such force that it changes its position, and with it that of the valves attached to it, whenever it passes the center of the shaft that carries the valves. The other end of the rod *l* is so journaled or loosely suspended in the wall *n* as to be capable of a vertical movement with the piston.

The operation of my hydraulic engine is as follows: Water is introduced from the supply or main pipe through suitable connections into the charge-compartment of the valve-chamber K, as indicated by the arrows in Figs. 3 and 5; thence into the ante-water-chamber I′, passing through port *b*, as indicated by the arrow in Fig. 2, which forces up the piston-head provided with the coupling until the member P acts upon the inclined face of the member R, the valve closing the passage-way and opening the other passage-way. This movement of the valves changes the course of the water and reverses the direction of the piston-head, which begins to descend, owing to the water passing upwardly through the passage-way G and falling upon the piston-head. The water that forced up the piston-head flows out of the cylinder through the same opening into the ante-water-chamber I, thence down the discharge passage-way, which is now open, into the discharge valve-chamber, and through the waste-pipe on the opposite side of the induction-passage, as indicated by the arrow in Fig. 3. In this way a continuous reciprocating motion is imparted to the piston-head.

Fig. 2 of the drawings shows the water being emitted from above and the piston-head ascending.

From this explanation it will be perceived that the induction passage-ways serve also as eduction passage-ways for the water—that is to say, the water is discharged from the cylinder through the same openings through which it was forced.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a hydraulic motor, the combination, with a reciprocating hollow piston-rod, of a coupling-rod having at its lower end a wedge-shaped member acting against a member attached to the shaft carrying the valves, for the purpose stated.

2. In a hydraulic motor, the combination, with a reciprocating hollow piston-rod, of a coupling-rod having at its lower end a pivoted wedge-shaped member provided with a notch or recess to receive one end of a spring-rod, for the purpose stated.

3. The two sets of valves connected to a shaft common to both, to insure their simultaneous movements, substantially as described, and for the purpose set forth.

4. In a hydraulic motor, the combination of the reciprocating hollow piston-rod, coupling-rod with the wedge-shaped member, compressing-spring rod, shaft with acting member, and the two sets of valves, substantially as described.

In testimony whereof I have hereunto subscribed my name.

JOHN ALOIS MYERS.

Witnesses:
JOHN M. MYERS,
M. J. REH.