J. B. MORROW.

WATER MOTOR.

No. 182,690. Patented Sept. 26, 1876.

Fig. 1.

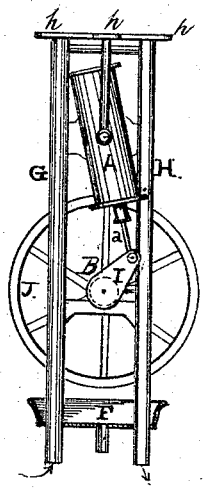


Fig. 3

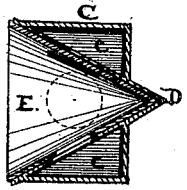


Fig. 2

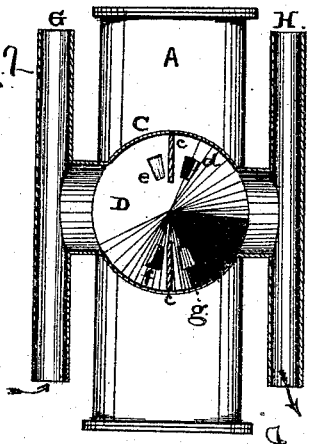
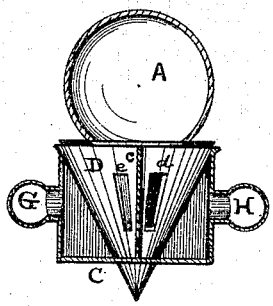


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN B. MORROW, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO CHARLES D. HINCKLEY AND EZRA HINCKLEY, OF SAME PLACE.

IMPROVEMENT IN WATER-MOTORS.

Specification forming part of Letters Patent No. **182,690**, dated September 26, 1876; application filed February 24, 1876.

To all whom it may concern:

Be it known that I, JOHN B. MORROW, of San Francisco, State of California, have invented an Improved Water-Motor or Engine for Propelling Sewing or other light Machinery, of which the following is a specification:

My invention relates to that class of motors for machinery that derive their power from the pressure or flow of a stream of water; and it consists of a novel construction of oscillating valve, and its arrangement in connection with the cylinder and other parts, forming a complete machine, as will be fully described hereinafter.

The accompanying drawings show, in Figure 1, a side elevation of my improved motor, with the tray or drip-pan in section; Fig. 2, an elevation of the cylinder, valve-chest, and supply and exhaust pipe, enlarged to three times the size of Fig. 1, the pipes and the outer case of the chest being shown in section. Fig. 3 is a side elevation in section of the oscillating valve and valve-chest; and Fig. 4 is a top view of the valve chest and pipes, the outer case of the chest being in section, and also the cylinder.

The motor consists of an oscillating cylinder, a valve for controlling the admission of the water, a piston-rod crank and fly-wheel, and pipes for conducting the water to and away from the cylinder. These parts are arranged as represented in Fig. 1, with a tray beneath them to catch the drippings from the mechanism, and with ears or lugs to secure the motor in place; but this arrangement may be varied without altering the nature or principle of my invention.

A is the cylinder, having a trunnion at one side, and a conical valve secured to the opposite side, that serve as pivots for the cylinder. B is the crank-shaft; I, the crank; and *a*, the piston-rod.

C is the valve-chest, secured between the standards that serve as supply and discharge pipes, the water entering through the pipe G, and being exhausted through the pipe H. This chest has a conical or tapering circular seat, formed of a stationary cone, D, and it is divided by the partition *c c* longitudinally into two divisions, one side communicating with the inlet-pipe G, and the other with the exhaust-pipe H. This cone is of the same form as the oscillating valve E, and the two are made to fit together exactly, so that no leaking of the water will take place.

The end of the cone projects beyond the case to provide a center or bearing for the valve E, and the top and bottom of this stationary cone D has supply and exhaust ports *e f d g* that open into the chest on either side of the partition *c c*.

The oscillating cone E has similar ports that are arranged in such relation to the other openings or ports that when one inlet-port is open the exhaust-port on the opposite side of the partition *c* and diagonally opposite to the open port is also open—that is to say, when the upper inlet-port *e* is open the lower exhaust-port *g* is likewise open, and while the upper part of the cylinder is being filled the water is flowing from the lower portion.

Figs. 2, 3, and 4 show the form and arrangement of the oscillating valve, valve-chest, and pipes.

The valve E, that is secured to the side of the cylinder A, and acts as a bearing for it to oscillate, is made with a tapering end, as shown in Figs. 3 and 4; but this form may be changed by having the end of spherical shape, without altering the operation of the valve. But in such case the shape of the fixed cone D in the valve-chest must be changed to coincide with the shape of the oscillating valve. These parts are shown as being arranged in a vertical position, but the cylinder may be placed horizontally with the supply-pipe G above and the exhaust-pipe H below the chest.

The upper part of the motor frame has ears or lugs *h h* for securing it to the table or other part of the machine to be driven by it, and the tray F has a waste-pipe to carry off the waste-water from it.

Connection is made with the pipes G H by means of hose or elastic tube secured to the ends beneath the tray.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

In combination, a conical or tapering valve, E, oscillating within a fixed cone, D, or a seat having the same form as the valve, a valve-chest, divided by the partitions *c c* above and beneath the cone, and the supply and exhaust pipes G H, the whole constructed, arranged, and operating substantially as herein shown and described.

In witness whereof I have hereunto set my hand and seal.

JOHN B. MORROW. [L. S.]

Witnesses:
PHILIP MAHLER,
EDWARD E. OSBORN.