

(No Model.)

H. R. WOLFE.
WATER MOTOR.

No. 396,318.

Patented Jan. 15, 1889.

Fig. 1.

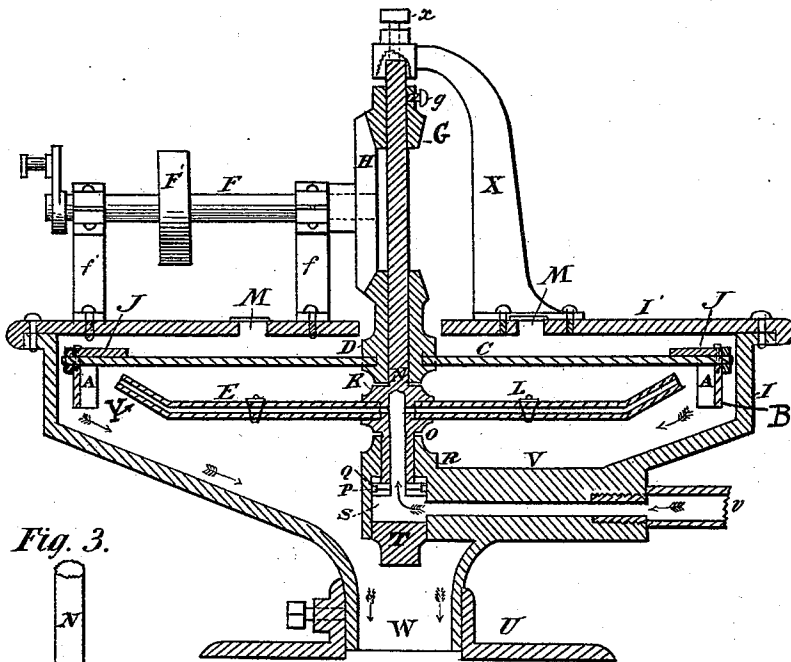


Fig. 3.

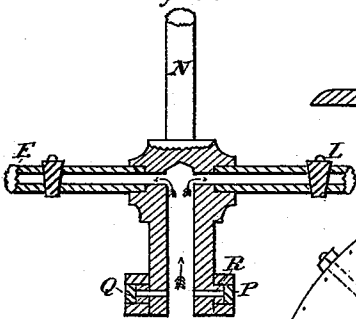
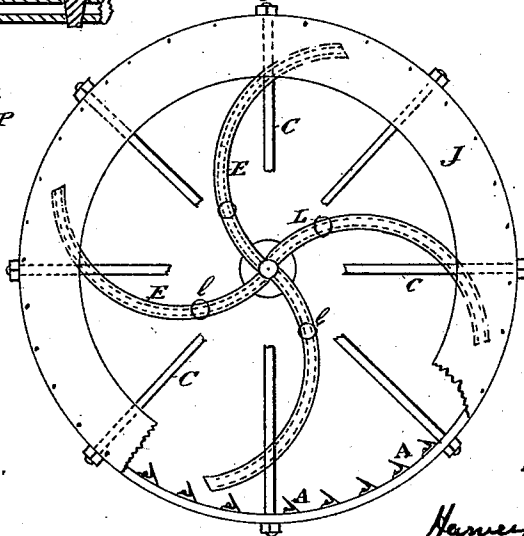


Fig. 2.



WITNESSES.

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WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 396,318, dated January 15, 1889.

Application filed June 13, 1888. Serial No. 277,001. (No model.)

To all whom it may concern:

Be it known that I, HARVEY R. WOLFE, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Water-Motors; and I do hereby 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.

My invention relates to improvements in water-motors having special reference to that class in which two concentric wheels are used. In most water-motors in which two wheels are used the water is carried after it has done its work and become dead-weight, and the water is so used that sand and other impurities in it increase the wear of the machinery.

The object of my invention is to provide a motor in which wear and friction from impurities in the water and from carrying dead-weight are avoided, the pressure of the water utilized to reduce weight and friction on the bearings to the minimum, and the quantity of the water used may be reduced without retarding the rate of flow. I accomplish these objects by the mechanism and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of my motor. Fig. 2 is a top plan view of the wheels, showing their relation to each other. Fig. 3 is a vertical sectional view, on an enlarged scale, showing the hollow part of the central spindle and its relation to the piston-head and conduit-pipes.

In my motor the two concentric wheels are horizontal, having for a common spindle the vertical shaft N, which is hollow in its lower part. The lower wheel is on the principle of the common turbine, receiving water from below, and thus relieving the lower bearing from the weight of a standing column of water, and discharging the water from the ends of the curved conduit-arms E. The upper wheel is constructed on the principle of an overshot wheel, except that the floats or blades A are bolted or riveted on the inside of the sole B instead of on the outside. These floats may be radial, curved, or angular. There is a

shrouding or circular plate, J, on the upper side of the wheel, but none on the lower side. The sole B extends down far enough to cover the nozzles of the conduit-arms E of the lower wheel, and is bolted to wrought-iron arms C, which are inserted into the hub of the lower bevel-pinion, D.

K is a hub on the shaft N, through which radial holes are made connecting with the hollow of the shaft, and into these holes the conduit-arms E of the lower wheel are inserted. The hub of the upper wheel revolves on and has a bearing on the hub K of the lower wheel.

I is the casing or frame for the motor, having a top, I', removably secured to it. The floats A are raised a proper distance from the casing I to allow a free discharge-way for the water issuing from the arms C after it has done its work.

The conduit-arms E are bent upward toward their ends, as at Y. All of the conduit-arms E are provided with stop-cocks L, so that the water may be readily shut off from any of them through man-holes M in the top I' of the casing, if it is desired to use less water.

X is a bracket with box to support the upper end of the spindle N, and x is a set-screw operating on the head of N.

G is a bevel-pinion held in place around N by a set-screw, g , through its hub.

H is a bevel-wheel engaging with the bevel-pinions G and D, having a shaft, F, supported by brackets f and f' with boxes. F' is a pulley for transmitting power.

V is a wing cast with the frame I, having a boss, O, on its inward end, which serves as a bearing for the hub K.

v is a water-inlet extending through the wing and to the center of the motor under the spindle N, and then upward through the boss O. In this part it is enlarged enough to admit the lower part of the spindle N.

S is a recess bored in the bottom of the wing under N, of sufficient diameter to admit a piston-head, P, keyed onto the lower end of N, or attached to it by a screw-thread. This piston-head is constructed with one or more expansive packing-rings, Q. These

rings are expanded by the pressure of water passing through small openings R.

The recess-bore S is closed at bottom by a screw-plug, T, which can be removed when necessary to attach or detach the piston-head P, or to clean out any sediment deposited.

U is a circular case to carry the upper casing, I.

Arrows show the course of the water.

The operation of my invention, which will be readily understood in connection with the above description, is as follows: The water under pressure, flowing through the opening *v* and upward through the hollow part of the spindle N, passes into the curved conduit-arms E, and, issuing from their ends, causes them to revolve rapidly in accordance with a well-known principle. The jets of water issuing from the ends of the arms E strike the floats A and cause them to revolve in a direction opposite to that in which the turbine wheel moves. The revolution of the wheels in opposite directions transmits a continuous motion to the shaft F through the bevel-pinions D and G and the bevel-wheel H. The effect of bending the conduit-arms upward is that the jets issuing will strike the shrouding J as well as the blades A, and tend to lift the wheel C and lessen the friction on the bearing K. The upward pressure of the water under the piston-head P tends to lift the weight of the shaft N and the two wheels from the bearing on O, which supports the whole, and thereby lessens the friction and wear at that point, which would otherwise be great. As the water as soon as it has struck the floats A falls freely out of the casing to the waste-outlet W, there is no dead-weight of water to carry and no backlash to retard the action of the wheels as they are running in air. When less power is needed, the water can be shut off from any of the conduit-

arms by the cocks L, or by loosening the set-screw *g*, and lifting the pinion G till its leaves are disengaged, and then tightening the screw so as to hold the pinion disengaged, the turbine wheel is put out of gear and can be held stationary by tightening the set-screw *x*, operating on the head of N, when the shaft F will be turned by the revolution of the upper wheel alone through the pinion D and the wheel H.

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

1. In a water-motor having two concentric wheels, the combination, with the frame I, having the top I', of the bracket X, the set-screw *x*, the vertical shaft N, the boss O on the wing V, the bevel-pinion G, and the set-screw *g*, substantially as set forth, and for the purpose specified.

2. In a water-motor, the combination, with the case I, having a removable top, I', provided with holes M, and a wing, V, provided with a boss, O, of an inlet-opening, *v*, through the wing V, a recess or bore, S, in the wing under the boss O, a screw-plug, T, a vertical shaft, N, hollow in its lower part, a piston-head, P, a turbine wheel having its conduit-arms provided with stop-cocks L and inclined upward at their extremities, a modified overshot wheel having floats A and shrouding J, a bevel-pinion, D, a bevel-wheel, H, and a bevel-pinion, G, having a set-screw, *g*, substantially as set forth, and for the purpose specified.

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

HARVEY R. WOLFE.

Witnesses:

R. M. KELLY, Jr.,

THOMAS L. NICHOLSON.