K. L. MILLS.

WATER-MOTOR.

No. 185,946. Patented Jan. 2, 1877.

FIG. 1.

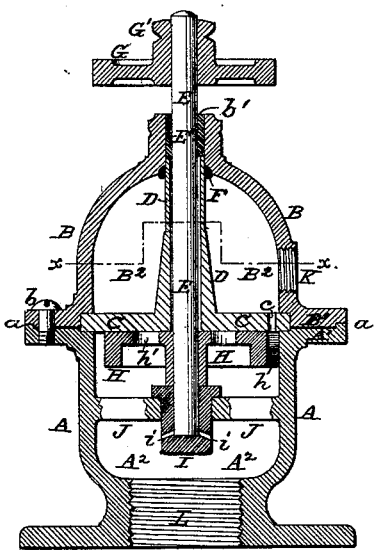


FIG. 4.

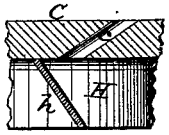


FIG. 2.

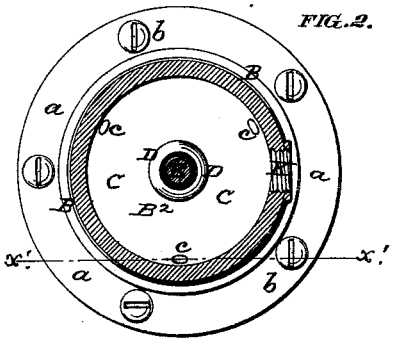
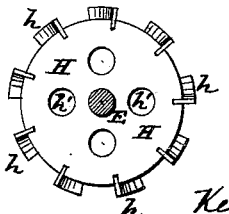


FIG. 3.



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UNITED STATES PATENT OFFICE

KELSEY L. MILLS, OF KANSAS CITY, MISSOURI.

IMPROVEMENT IN WATER-MOTORS.

Specification forming part of Letters Patent No. **185,946**, dated January 2, 1877; application filed October 19, 1876.

To all whom it may concern:

Be it known that I, KELSEY L. MILLS, of Kansas City, in the county of Jackson, State of Missouri, have invented certain new and useful Improvements in Water-Motors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My improvement relates to a water-motor on the general principle of a turbine-wheel.

In my improvement the water from the induction-pipe enters an annular chamber between the outer case and an inner removable piece, consisting of a disk whose edge is tightly fixed in the case, and a tubular part, extending upward centrally from the disk and surrounding the wheel-shaft, and having its upper end closely packed to the upper part of the case, so as to prevent the escape of water from the chamber. The said disk has inclined orifices, through which the water descends from the annular chamber and impinges upon the buckets of the water-wheel. The construction is such that the water does not come in contact with any part of the wheel shaft above the discharge-chamber, so that the shaft does not require to pass through any stuffing-box or packing to prevent the escape of water, and thus much friction is avoided. The wheel has orifices, to allow the escape of water from its upper side, so that there is no tendency in the water to pass up around the shaft. The wheel-shaft is stepped in a cup or socket supported in a cross-bar, and holes extend from the bottom of the socket outward and downward, to allow the escape from the socket of any grit that may have entered it.

In the drawings, Figure 1 is an axial section. Fig. 2 is a horizontal section at *x x*. Fig. 3 is a plan of the wheel. Fig. 4 is an enlarged detail section at *x' x'*, showing one of the inclined water orifices or spouts, and one of the buckets of the water-wheel.

The case consists of two parts, A and B, connected together at about the midheight by a circular horizontal flange-joint, *a*, with screws *b*. The joint has an annular recess or counter-bore, A^1, in the part A, and the part B has a suitable annular projection, B^1, to fit therein, so as to keep the parts A and B exactly in line. In A^1 may be laid a thin gasket, to insure perfect tightness in the joint. C is a disk, whose margin is tightly clamped between the parts A and B, as shown, so as to make a water-tight joint at this point. D is a tubular part, arising centrally from the disk C, and somewhat loosely surrounding the shaft E, and extending up into the top orifice of the part *a'* of the case. F is a rubber ring, which surrounds the part D at its upper end, and which fits in a recess at the bottom *a'*, (being forced up therein by the pressure of water,) and which prevents the escape of water from the chamber B^2. E' is a bushing, surrounding the wheel-shaft in the orifice *b'*. This bushing is preferably made of wood or some other substance that will prevent noise in running. G G' are, respectively, the balance-wheel and belt-pulley, the latter of which carries a belt, to convey power to any machine to be operated. In the disk C are inclined orifices *c*, through which the water descends from the chamber B^2, to impinge, at about a right angle, upon the inclined buckets *h* of the bucket-wheel H, which runs close beneath the disk C. I prefer to make these buckets radial to the wheel at their upper edges, and to incline them at an angle of about forty degrees from the vertical. The outer edges of the buckets are almost in contact with the interior of the case, so as to prevent leakage of water between the outer edges of the buckets and the case. *h'* are openings through the wheel H, to allow the escape of water from its upper side, so that the water will not reach the part of shaft E above the wheel. The shaft E is stepped in a cup, I, supported in a cross-bar, J.

The step-cup may be of hard wood or any other suitable substance. The bottom of the cup has orifices *i*, to allow the escape of any grit that may enter the cup.

K is the induction-opening, leading into the chamber B^2; and L is the eduction-opening, leading from the chamber A^2 to the waste-pipe.

I claim—

1. The combination of the case B, disk C, tube D, and packing-ring F, substantially as and for the purpose set forth.

2. In combination with the parts B, C, D,

and F, the shaft E, extending upward from the lower chamber A^2, and out through the top of the case, substantially as and for the purpose set forth.

3. In combination with the parts B, C, D, and F, and the lower portion A of the case, (A B,) and the shaft E, the bucket-wheel H, having openings *h'*, to allow the escape of water from the upper side of the wheel, as set forth.

4. The step-cup I, provided with holes *i*, substantially as and for the purpose set forth.

KELSEY L. MILLS.

Witnesses:
SAML. KNIGHT,
ROBERT BURNS.