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PATENTED JUN 27 1871

Fig. 1.

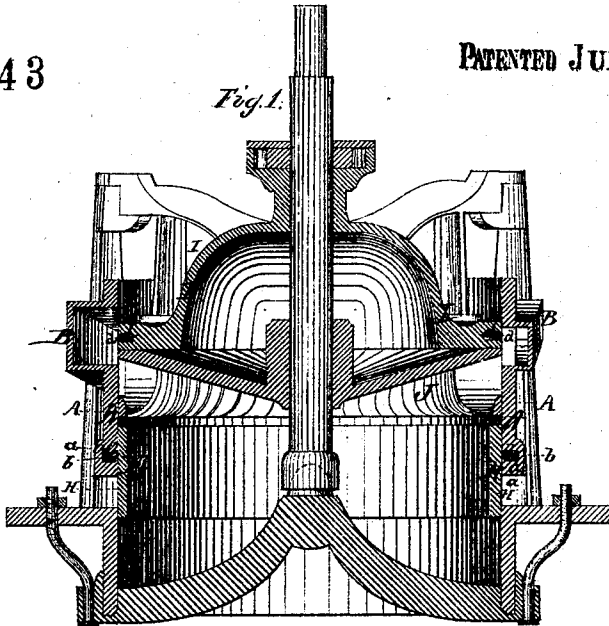
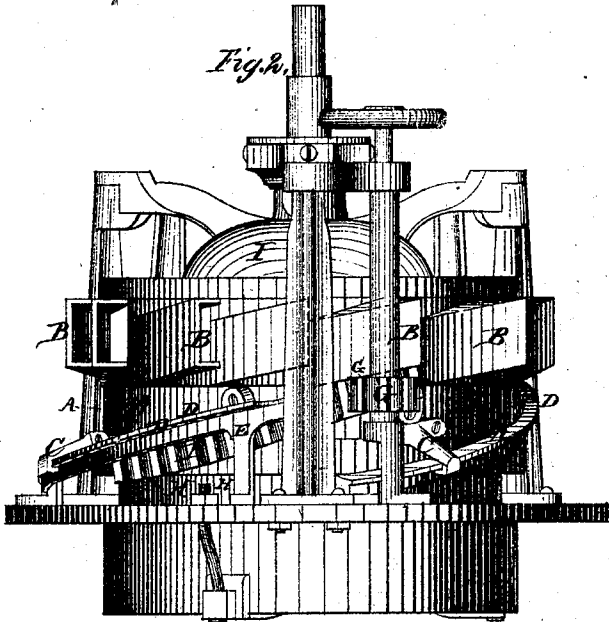


Fig. 2.

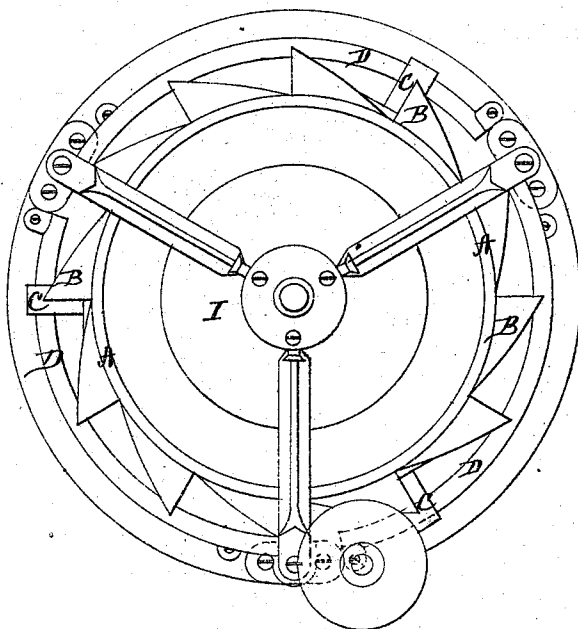


Witnesses
John A. Hodge
J. White

Inventor,
Otis J. Hodge
Per
T. H. Alexander
Atty.

Otis J. Hodge's Water Wheel.

Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

OTIS J. HODGE, OF NORTH ADAMS, MASSACHUSETTS.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 116,443, dated June 27, 1871.

To all whom it may concern:

Be it known that I, OTIS J. HODGE, of North Adams, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon which form a part of this specification.

The nature of my invention consists in the construction and arrangement of the gate for a turbine water-wheel, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal vertical section; Fig. 2, a side view; and Fig. 3, a plan view.

The gate is composed of a ring, A, with a series of spiral chutes, B B, attached. The gate turns about one-third around to open or close, and it rises to close, and falls open by means of arms C C projecting from the same and resting upon inclines D D, as shown. The chutes B B are cast on an angle to correspond with the inclines D D, which makes it act like a screw in the water, and as the gate is exposed to the water alike on all sides it is balanced, and consequently easily operated to open or close. It will be noticed that the points of the chutes drop down. Now, as the gate is turned around with points going forward, it tends to draw the gate down and open it; and in the same manner when it is turned back, the mouths of the chutes going forward, the inclination of the chutes tends to raise it up and close it. The gate is turned by a rack, E, and pinion G, the rack being spiral to agree with the inclines D D and inclination of the chutes B B. At the bottom of the gate A is an enlargement, *a*, which is hollow and provided with a packing-ring, *b*, so that water pressing against the back holds it against the tube H, on which the gate slides and turns, to prevent leakage at that joint.

There is also a groove cut in the upper casing I, which the gate incloses. This contains a packing-ring, *d*, which presses out against the inside of the gate, and when the gate is closed sets against a portion of the gate that is turned true and smooth, thus preventing leakage between the top head and gate. This packing-ring is composed of a strip of leather, rubber, or other suitable material, and is folded and the edges put into the grooves first, so that when the water acts upon it it expands in the groove and at the same time sets against the surface to be packed, thereby making a very cheap and effective packing. The wheel J is similar to the one already patented by me.

The advantages of my gate are mainly as follows: By making the chutes spiraling it gives the water a downward and inward motion, to correspond with downward and inward inclination of the buckets of the wheel. It also has the advantage of keeping the water more compact than it would be if the chutes ran straight around the gate. In case of the gate being partially open the water would be conducted into a part of the buckets of the wheel instead of being let in in a thin sheet to break up over the whole wheel, as it does in those wheels where the chutes run straight around the gate.

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

1. The gate A, provided with chutes B B, arranged spirally, substantially as shown and described, and for the purposes herein set forth.

2. The gate A, with spirally-arranged chutes B B, in combination with the arms C C, inclines D D, spiral rack E, and pinion G, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

OTIS J. HODGE.

Witnesses:

A. PATTER,
JAMES PIKE.