

WATER-WHEEL.

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per
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **173,723**, dated February 22, 1876; application filed January 4, 1876.

To all whom it may concern :

Be it known that I, J. L. HELMER, of Rome, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Water-Wheels; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in water-wheels; and it consists in the arrangement and combination of parts that will be more fully described hereinafter, whereby the gate is readily and easily operated and the leakage of water prevented.

The accompanying drawings represent my invention.

a represents the casing of the wheel, which has a circular groove formed around upon its top, in which a flange of the dome *b* snugly fits, for the purpose of forming a joint at this point to prevent leakage.

The gate *c*, which is placed inside of the casing in contact with the wheel, instead of being suspended by the casing in the usual manner, is supported by the spider *d*, which rises from the bridge-tree *e*.

The bottom edge of the gate is recessed at *g* to receive the flange formed on the arms of the spider, for the purpose of supporting the gate in position, and to prevent the spider-arms from being forced out of line of bridge-tree arms by the action of the water escaping from the wheel when the gate is full drawn.

In the inner side of the casing, at the point *h*, is made an annular recess, which is to be filled with any suitable packing, so as to prevent leakage between the casing and the gate.

In order to prevent sand and grit from getting between the joints of the spider and the step, a suitable plate, *J*, is placed over them, as shown, so as to protect them.

Upon the top of the casing is formed a flange, *l*, and the inside of this flange, to a distance below the top of the casing, is reamed out, so as to form the shoulder *n*. The outer edge of the gate has a flange, *o*, formed upon

it, which snugly fits inside of the reamed-out part, but does not sink down far enough to rest upon the shoulder, thus leaving a space between the shoulder and flange or follower, to be filled with packing to prevent leakage at this point.

Through the dome, at one side, is made a suitable opening, in which the lower edge of the sleeve *2* is placed, the said sleeve being provided with the horizontal flange *3*, by means of which it is bolted to the dome. Passing down through this sleeve is the cranked shaft *4*, having a socket, *5*, in its upper end to receive a lever or key for turning it, and having a friction-roller placed upon its lower cranked end, where it works between the bifurcated arm *6*. This arm is secured to the top of the gate, projects inward over the top of the wheel, and is braced upon each side, as shown. The cranked end of the shaft, catching in this arm, forces the gate back and forth around, so as to open and close the chutes. Upon the top of the sleeve *2* is a collar, *7*, provided with a set-screw, *8*, and which forms a bearing for the shaft to hold it in position.

Having thus described my invention, I claim—

1. The shaft *4*, having a socket, *5*, in its upper end and a crank upon its lower end, in combination with the sleeve *2*, substantially as described.

2. The casing *a*, having the flange *l*, and recessed on its inner edge to form a packing-chamber, substantially as specified.

3. The gate *c*, having a follower or flange, *o*, upon its outer edge, to fit in the recess in the casing, substantially as shown and described.

4. The spider *d*, for supporting the gate *c*, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 27th day of December, 1875.

JAMES L. HELMER. [L. S.]

Witnesses:

C. L. STEVENS,

CHARLES H. DUNNING,