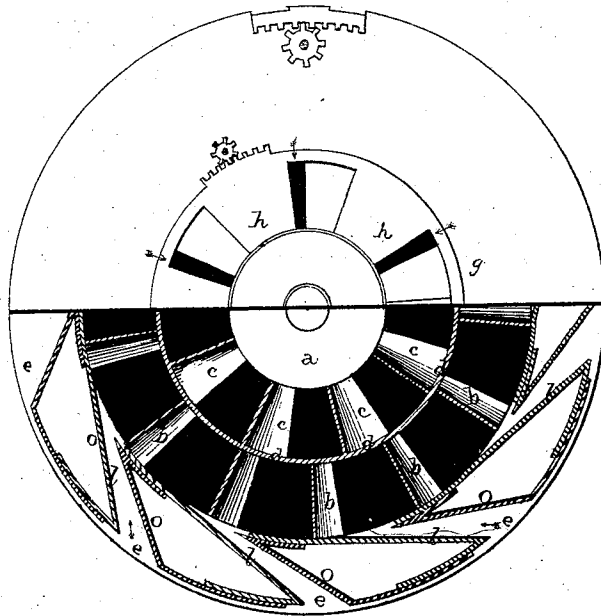


J. HARRIS.

Turbine Water-Wheels.

No. 136,372.

Patented March 4, 1873.



WITNESSES.

F. A. Lehmann.

W. H. Duhamel.

INVENTOR.

Joel Harris.

*Per H. A. Abbott
att'y.*

UNITED STATES PATENT OFFICE.

JOEL HARRIS, OF NEW CARLISLE, INDIANA.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. 136,372, dated March 4, 1873.

To all whom it may concern:

Be it known that I, JOEL HARRIS, of New Carlisle, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Water-Wheels, of which the following is a specification:

The nature of my invention relates to the construction of a water-wheel; and consists in the use of two separate and distinct sets of buckets in the wheel, and two separate sets of gates and chutes, so that the water can be used upon either or both sets of buckets at once. It also consists in the construction of the gate used around the outer wheel or buckets, as will be more fully set forth hereafter.

In the accompanying drawing, my wheel is shown partly in section.

a represents the wheel, provided with two separate and distinct sets of buckets, *b c*, separated by the circular wall *d*, the former receiving the impact of the water through the side of the case *e*, and the latter from the top through the crown-plate *g*. Each of these sets of buckets is provided with a separate and distinct gate, so that either or both at once may be used, according to the supply of water or the amount of power required. The gate *h*, upon the top of the crown-plate, and regulating the flow of water upon the inner set of buckets, is a common register-gate, and can be operated by any suitable devices. The chutes, through which the water is delivered to the outer set of buckets, are placed at an angle to the curve of the casing, so as to diminish the size of the chutes just at that point where the water strikes the buckets. These chutes consist of walls or plates *l*, cast as a part of the casing, and which have their outer ends turned outward and back, forming a triangular space between them at this point. The

gate *o* for controlling the flow of water through these chutes is similar in shape, and so fits around them as to completely close the space formed by the chutes, as shown in the drawing. As these gates close they gradually fill the chutes, but maintain a wedge-shaped opening, through which the water passes to the wheel from first to last. When the chutes are of an equal width through their whole length, the water, as soon as the gate begins to close, is apt to scatter, and thus lose much of its power; but by contracting the throat of the chute, the water becomes compressed, and strikes the buckets in a solid body.

These parts may be slightly varied without departing from the spirit of my invention, and I therefore do not limit myself to the precise construction shown.

This wheel is especially adapted to those streams in which there is an abundant supply of water part of the year and a very scanty one for the remainder.

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

1. A water-wheel so constructed that it may be driven either from the center or from the periphery, or both at once, substantially as described.

2. The wheel *a* provided with the two sets of buckets *b c*, and two sets of chutes and gates, relatively arranged substantially as specified.

In testimony that I claim the foregoing as my invention I hereunto affix my signature this 4th day of January, 1873.

JOEL HARRIS.

Witnesses:

WELLS F. PIDGE,
SAMUEL C. LANCASTER.