R. Dunbar,

Turbine Wheel.

No. 90,826. Patented June 1. 1869.

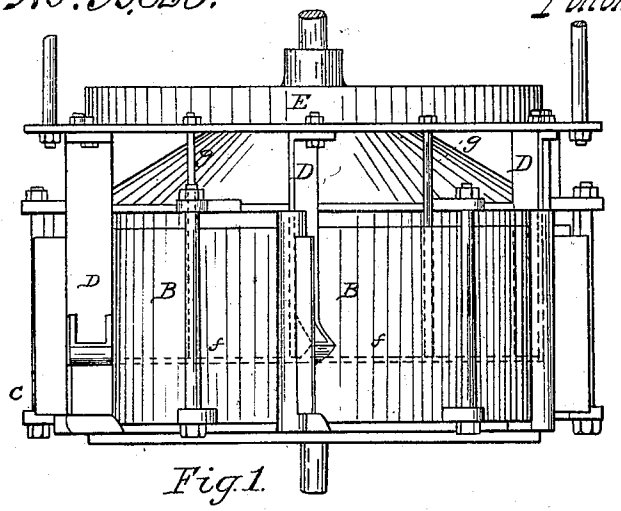

Fig. 1.

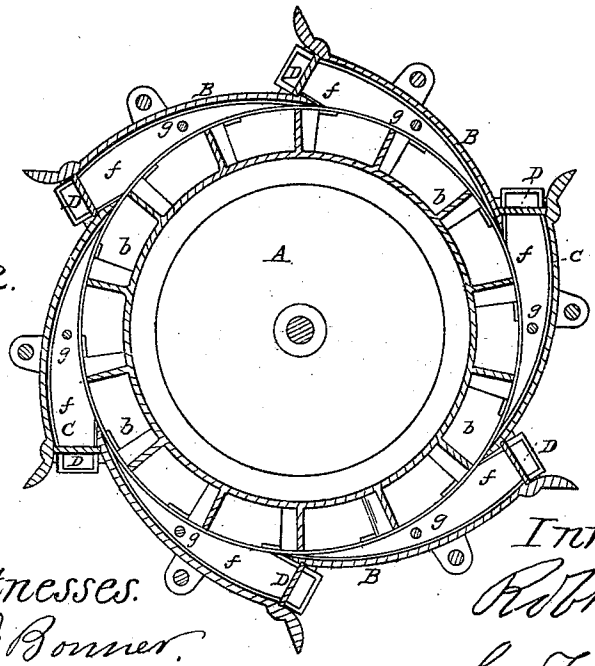

Fig. 2.

Witnesses.
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ROBERT DUNBAR, OF BUFFALO, NEW YORK.

Letters Patent No. 90,826, *dated June* 1, 1869.

IMPROVEMENT IN TURBINE WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ROBERT DUNBAR, of the city of Buffalo, in the county of Erie, and State of New York, have invented a certain new and useful Improvement in Turbine Water-Wheels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My improvement relates to that class of turbine-wheels in which the water is fed horizontally to the wheel from the outside, through suitable chutes or passages in the curb, or case surrounding the wheel. These passages are provided with vertically-sliding gates, by which the area of the openings, and consequently the quantity of water admitted to the wheel, is regulated.

As the water flows through the apertures left beneath the ordinary gates, it has a tendency to rise or expand, as it escapes, in that portion of the chute within the gate, which breaks up the uniformity and directness of the current, and consequently diminishes the force of the impact and action against the buckets.

My invention consists in attaching, to the lower edge of the gates, a horizontal guide, projecting inward into the chute, and forming a continuation of the aperture left beneath the gate, whereby the water, in its passage to the wheel, is compelled to flow in a direct and unbroken mass till it impinges with its full force against the buckets.

In the drawings, before referred to—

Figure I is a side elevation of the curb, or wheel-case.

Figure II is a horizontal section of the wheel and curb.

Like letters of reference designate like parts in each of the figures.

A is a horizontal turbine-wheel, and *b*, the buckets thereof, of any ordinary construction.

B is the curb, or wheel-case, and

C C, chutes, opening tangentially on to the wheel.

D D are the vertically-sliding gates for regulating the area of the chutes.

E is an annular ring, above the curb, to which the gates are attached.

f f are my improved guides, made to conform with the horizontal sectional area of the chutes, and attached to the lower edge of the gates, so as to be flush therewith.

Stay-rods *g* connect these guides with the ring E.

These guides, being thus attached to the gates, are adjusted with them, so that the passage beneath the guides will always conform in height to the mouth of the aperture left beneath the gate, and thereby form a uniform conduit to the buckets.

I am aware that guide-plates, attached to and operated by a movable curb, have been heretofore used. I therefore do not claim such guide-plates broadly; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the guides *f* with the gates D, rods *g*, and ring E, arranged and operating as described.

Witnesses: ROBT. DUNBAR.

JNO. J. BONNER,

F. A. LANGWORTHY.