N. H. GOULD.

TURBINE WATER-WHEEL.

No. 190,752. Patented May 15, 1877.

Fig. 1

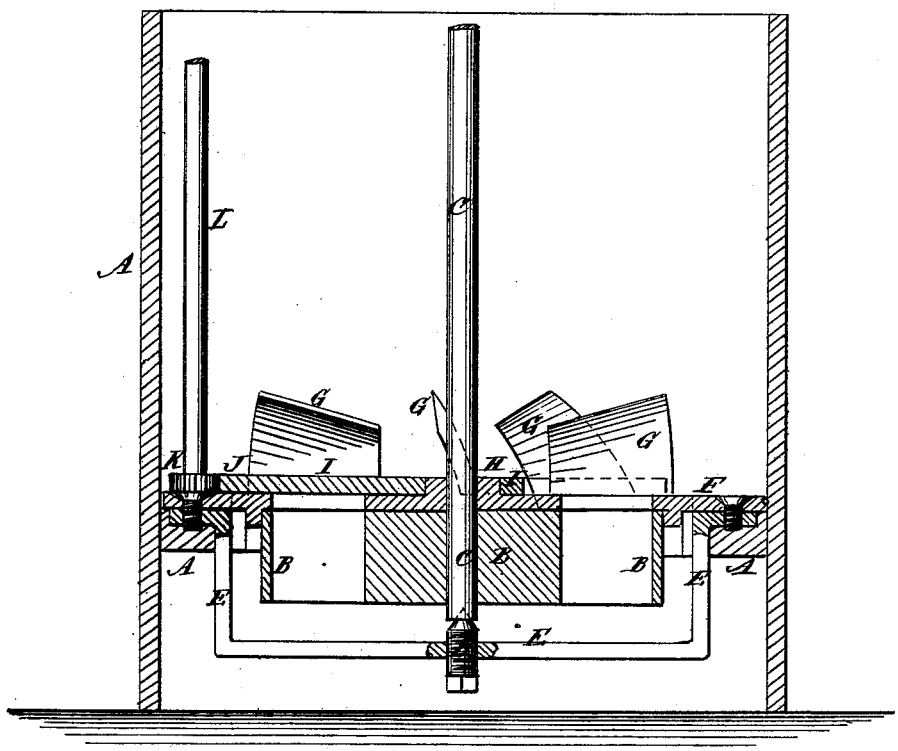


Fig. 2.

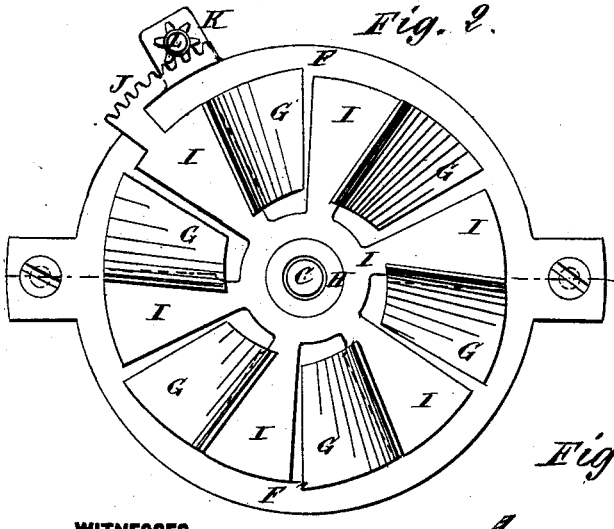


Fig. 3

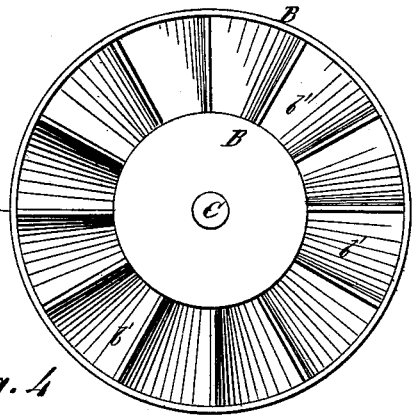
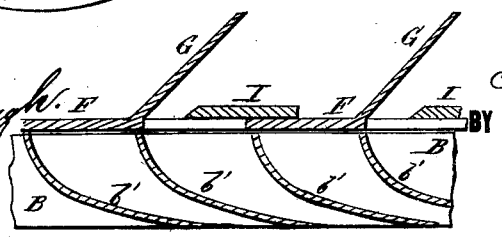


Fig. 4



WITNESSES:

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UNITED STATES PATENT OFFICE.

NATHAN H. GOULD, OF OAKFIELD CENTRE, MICHIGAN.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **190,752**, dated May 15, 1877; application filed April 16, 1877.

To all whom it may concern:

Be it known that I, NATHAN H. GOULD, of Oakfield Centre, in the county of Kent and State of Michigan, have invented a new and useful Improvement in Turbine Water-Wheels, of which the following is a specification:

Figure 1 is a vertical cross-section of my improved wheel, shown as arranged in a flume. Fig. 2 is a top view of the top plate or deck of the wheel. Fig. 3 is a bottom view of the wheel. Fig. 4 is a detail section of the wheel.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved water-wheel which shall be simple in construction and inexpensive in manufacture, and at the same time very effective in operation.

The invention is an improvement in the class of water-wheels having guides for directing the water against the buckets. Hitherto the guides have been box-shaped, and have, to some extent, hindered the passage of water to the wheel proper. I have adopted a construction which secures the advantages of the use of guides without such drawback.

A represents the flume or pen-stock, in a hole in the bottom of which the wheel B is placed. The wheel B is attached to a shaft, C, the lower end of which is concaved, and revolves upon a pivot or step, D, attached to the center of the bar E. The bar E, at the sides of the wheel B, is bent upward at right angles, and at the top of the wheel is again bent outward at right angles, so as to overlap the floor of the flume A, and is bolted to the cover or deck F. The deck F is made larger than the hole through the flume-floor, so as to rest upon said floor, and thus support the wheel. In the deck F is formed a circle of holes directly over the buckets *b'* of the wheel B, so as to allow the water to pass directly to said bucket. To the deck F, at the forward edges of the holes through it, are attached guides or chutes G, which project upward and incline to the rearward at such an angle as will cause the water to strike the buckets of the wheel B in the proper direction. The chutes G are made of such a size as to cover the holes through the deck F, and thus relieve the buckets of the wheel B from the direct downward pressure of the water.

H is a ring formed upon or attached to the middle part of the deck F around the shaft C, to serve as a hub for the gates I. I prefer to make the ring H separate, and secure it to the deck F by bolts, so that it may serve as a stuffing-box to prevent water from passing down around the said shaft C.

The gates I are made in the form of a ring-plate, provided with as many wings as the deck F has outlet-holes, and of such a size as to wholly cover said outlet-holes when turned over them.

To one of the gates I is attached a section of a ring-rack, J, with the teeth of which engage the teeth of a small gear-wheel, K, attached to a rod, L, the lower end of which revolves in bearings formed upon or attached to the deck F. The upper end of the rod L projects into such a position that it may be conveniently reached and operated by the attendant to open and close the gates I.

I am aware of Patents Nos. 23,945 and 98,913, but claim nothing therein shown or described.

In my wheel the deck or surface of the throat-plate is flat and smooth, so that scarcely any impediment is offered to the free passage of the water through the outlet-holes, and the guides G aid materially in directing the water at right angles against the buckets of the wheel. I thus combine the most desirable features of construction, and produce a superior wheel.

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

The flat smooth deck or throat plate F, having the inclined guides G attached at one edge of the outlets, the gate I, having radial fan-shaped blades and resting on the deck, the wheel A, shaft, and step-bar, all combined as shown and described, to operate as and for the purpose specified.

Witnesses: NATHAN H. GOULD.
MOSES PETERSON,
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