J. CROFT.

Turbine Water-Wheel.

No. 209,662. Patented Nov. 5, 1878.

Fig: 3.

Fig: 1.

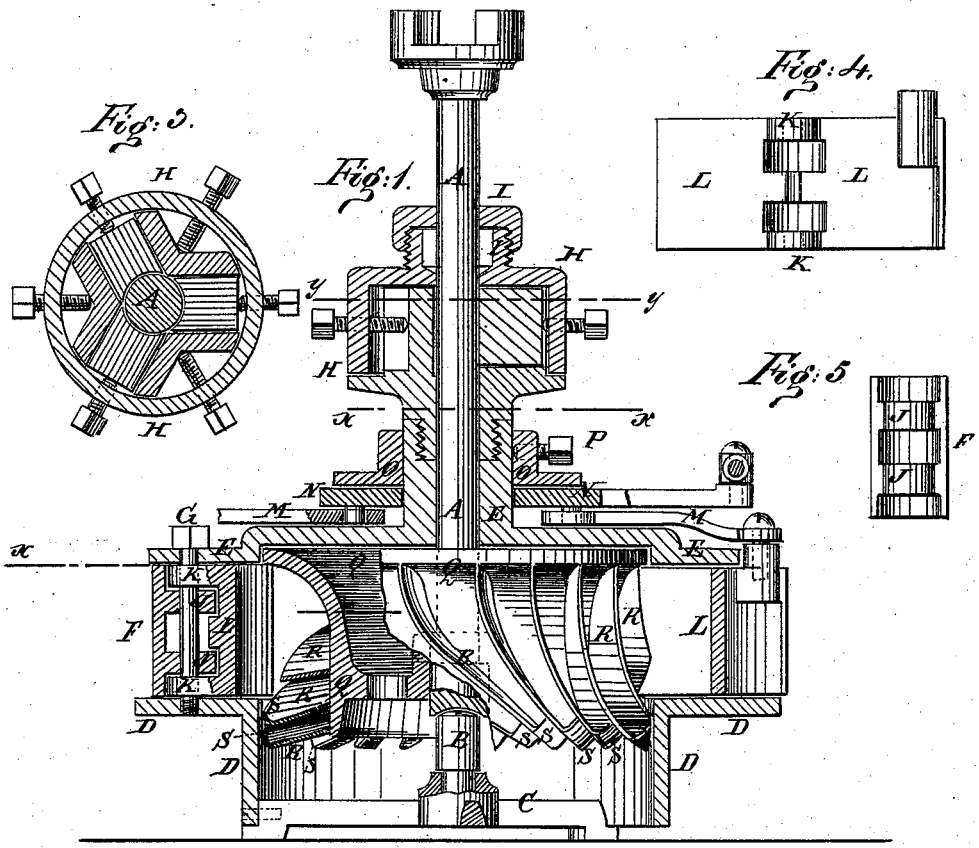
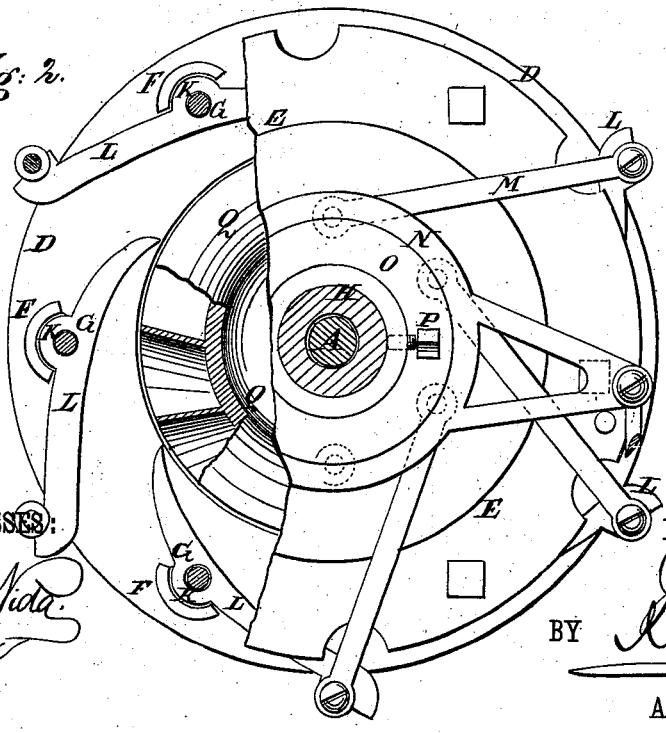


Fig: 4.

Fig: 5

Fig: 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JACOB CROFT, OF SCIPIO, UTAH TERRITORY.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **209,662**, dated November 5, 1878; application filed July 16, 1878.

To all whom it may concern:

Be it known that I, JACOB CROFT, of Scipio, in the county of Millard, Utah Territory, have invented a new and useful Improvement in Turbine Water-Wheels, of which the following is a specification:

Figure 1 is a vertical section of my improved wheel. Fig. 2 is a top view of the same, partly in section, through the line *x x x*, Fig. 1. Fig. 3 is a detail section taken through the line *y y*, Fig. 1. Fig. 4 is a detail view of a gate. Fig. 5 is a detail view of a post.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved wheel which shall be so constructed as to prevent back-pressure by the water against the casing as it escapes from the buckets, which will prevent sand and other substances in the water from entering around the shaft and cutting or wearing it, and which will enable the gates to be secured in place in a simple and convenient way.

A represents the wheel-shaft, the lower end of which revolves upon the step B, attached to the spider C, the arms of which are secured to the lower edge of the lower part, D, of the casing. The casing D is provided with an outwardly-projecting ring-flange at its upper end, which forms the lower parts of the chutes.

E is the upper part of the casing, which is connected with the lower part, D, and held at the proper distance from it by the posts F, which are secured to and between the said parts by bolts G.

Upon the center of the casing E is formed a hub, to which is attached the centering-box H, which is provided with blocks, angle-irons, and set-screws for centering the shaft in the usual way. Upon the top of the centering-box H is formed, or to it is secured, a stuffing-box, I, to receive packing, to prevent sand and other substances in the water from working in around the shaft and cutting or wearing it or its bearings.

Upon the inner side of the post F are formed lugs J to interlock with lugs K, formed upon the inner sides of the gates L, which lugs are pivoted to each other by the bolts G, that secure the said posts F to the casing. In this way the gates L are secured in place in a convenient and simple way, and in such a way as to afford little obstruction to the entrance of the water.

To the upper forward corners of the gates L are pivoted the outer ends of arms M, the inner ends of which are pivoted to a ring-plate, N, placed and revolving around the hub of the upper part, E, of the casing, and which is held down to its place by a collar, O, and set-screw P.

To the shaft A, between the parts D E of the casing, is attached the wheel Q, the buckets R of which curve downward and rearward, and upon their lower outer corners are formed flanges S, which project upward and are secured to the lower side of the adjacent buckets.

The lower parts of the buckets R project down into the cylindrical part of the casing D, and the flanges S prevent any back-pressure from the water against the said casing D.

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

1. The combination of lugs J on posts and lugs K on the inner sides of gates, said lugs being pivoted together, for the purpose set forth.

2. The rearwardly and downwardly curved buckets of a turbine wheel, provided with flanges S projecting up and attached to lower side of adjacent buckets, in combination with casing D, for the purpose specified.

JACOB CROFT.

Witnesses:

JOHN POWELL,

EDWARD PARTRIDGE.