J. B. McCORMICK & J. L. BROWN.

TURBINE WATER-WHEEL.

No. 185,341. Patented Dec. 12, 1876.

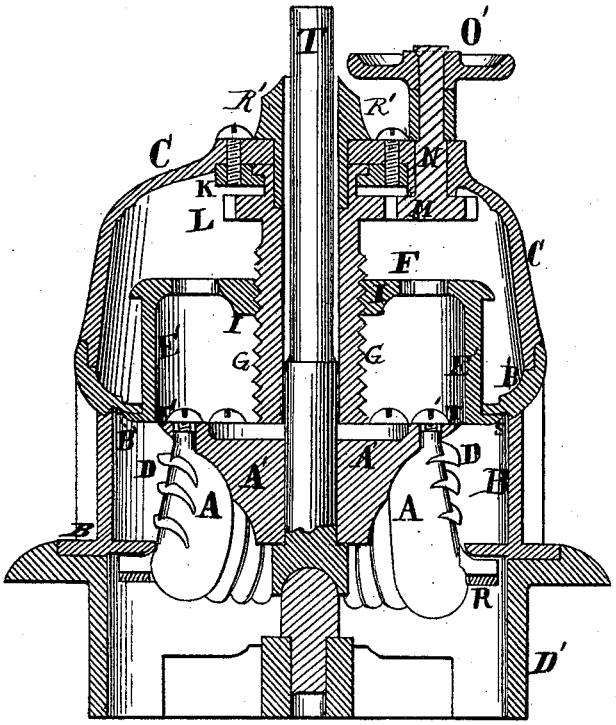

Fig. 1

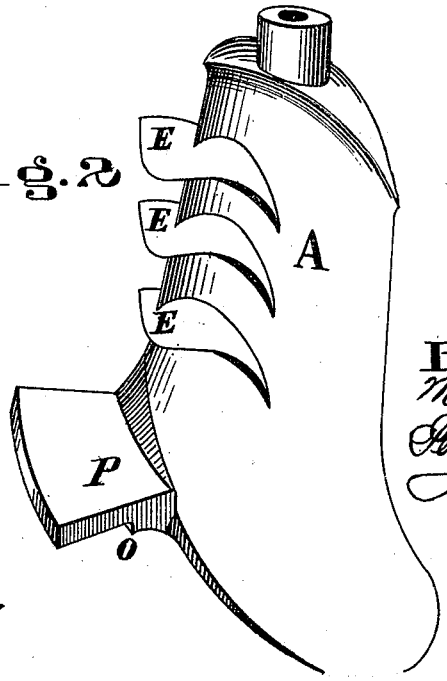

Fig. 2

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UNITED STATES PATENT OFFICE.

JOHN B. McCORMICK, OF ARMAGH, AND JAMES L. BROWN, OF BROOKVILLE, PENNSYLVANIA.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **185,341**, dated December 12, 1876; application filed July 3, 1876.

To all whom it may concern:

Be it known that we, JOHN B. McCORMICK, of Armagh, in the county of Indiana, and J. L. BROWN, of Brookville, in the county of Jefferson, and State of Pennsylvania, have invented certain new and useful Improvements in Turbine Water-Wheels, of which the following is a specification, in which—

Figure 1 is a vertical section, and Fig. 2 is a perspective view of one of the buckets.

This invention relates to certain improvements in that class of water-wheels patented to us January 11, 1876; and consists, first, of wings or water-guides fixed on the faces and outer edge of the buckets; secondly, in combining a series of stationary chutes, a raising ring-gate operating in an unobstructed annulus between the wheel and chutes of a conical-impact turbine wheel.

Other features pertaining to our invention will be fully described in the following description, having reference to the drawings:

A′ represents the hub of the wheel; A, buckets, bolted to the hub, as shown in Fig. 1. B represents the chutes, which are composed of a series of guides made of thin metal. B′ B′ represent annular rings, to which the guides are rigidly attached at top and bottom. C represents the crown or covering of the wheel and case. D′ represents the lower part of the case, which sustains the chute-case and wheel, as shown in Fig. 1. The buckets and bucket-orifices are of the same shape, and the buckets are attached to the wheel in the same manner, as shown in our former patent, except the segmental flange P has an annular shoulder, O, cut on its lower side to fit closely to ring R, to which flange P is bolted. The ring R is first heated and shrunk onto the series of segmental flanges P, thus making a rigid close fit, and firmly uniting the parts of the wheel. D represents an annulus between the chutes and outer edges of the buckets A. E represents wings or water-guides on the front and rear face and outer edge of the buckets. These guides are preferably placed on the buckets so that they will each be just above the lower edges of the ring-gate E′ when it is set at one-fourth, one-half, and three-fourths gate, respectively. These wings are made to project outwardly from the bucket into space D, so as to better guide the water onto the lower part of the bucket-faces at partial gate. The edges of these guides on the front and rear side of the bucket should be of sufficient distance apart to allow sticks or substances passing through the chutes to also pass between the wings on the buckets. The wheel is preferably made with the buckets inclining backward at a slight angle to the shaft, and the wings or guides E at a right angle to the bucket-faces. E′ represents the ring-gate; F, the top or crown, which may be made of hub and arms, or of a piece of metal having a hub at the center, and the crown perforated; I, a hub, with female screw-threads cut in the opening in the hub, to receive a male screw, G. This male screw is composed of a hollow sleeve, which swivels on stuffing-box R′ in the crown C, in which the shaft T journals; or the top of the case C may have a downwardly-projecting hub attached to it for the screw G to swivel on. K represents two semicircular rings, screwed to the crown C to hold the screw G up to the casing. L represents a pinion rigidly attached to the screw G, and M a pinion mounted on shaft N, meshing with pinion L. O represents a hand-wheel, mounted on shaft N, which, when rotated, turns screw G, and raises and lowers the ring-gate E′. S represents lips, projecting outwardly from the ring-gate E′ into the chuteway B, and is made of such shape and location as to form, if desired, a water-joint at the top of the chute when the gate E′ is fully drawn. It also guides the water into the wheel, and assists in giving it a direction downward at part gate, assisting the operation performed by the wings E.

The water-joint, however, may be made by having the ring E′ a close fit to the edge T′ of the crown-wheel.

Having described our invention, what we claim as new is—

1. A water-wheel having a wing or water-guide, one or more, on the outer and rear face and outer edge of the buckets, substantially as shown and described, for the object specified.

2. A water-wheel having the chuteway B,

annular space D, and conical or inclined buckets A, with projecting wings E, substantially as herein set forth.

3. A water-wheel arranged with an annulus between the chute and bucket-faces, provided with conical or inclined bucket-faces and discharge-orifices, substantially as herein set forth.

4. The ring-gate E′, with lips S projecting into the chutes B, to assist in guiding and controlling the delivery of the water, substantially as set forth.

5. The ring-gate E′, in combination with screw-sleeve G, swiveling on crown C, with mechanism arranged to draw and close the gates, substantially as set forth.

In testimony whereof we have hereunto set our hands this 1st day of July, 1876.

JOHN B. McCORMICK.
JAMES L. BROWN.

Witnesses:
ASHLEY B. TOWER,
ALBERT A. TYLER.