

(No Model.)

J. H. INGRAM.

WATER WHEEL.

No. 303,642.

Patented Aug. 19, 1884.

Fig. 1

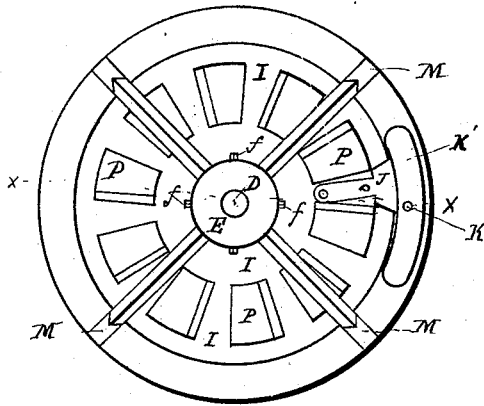


Fig. 2

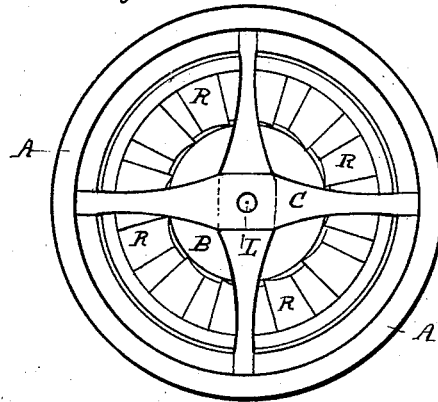


Fig. 5

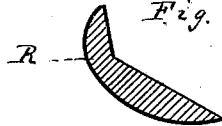
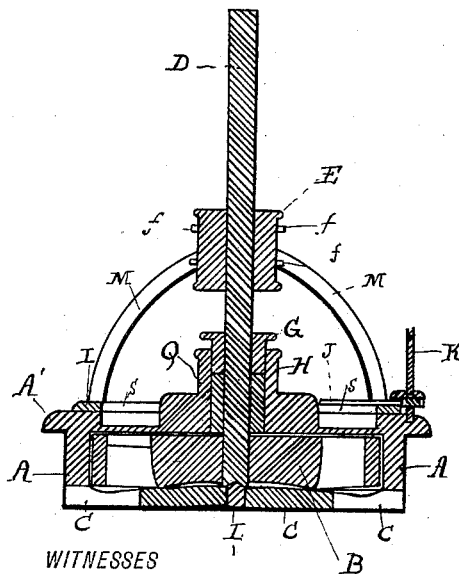
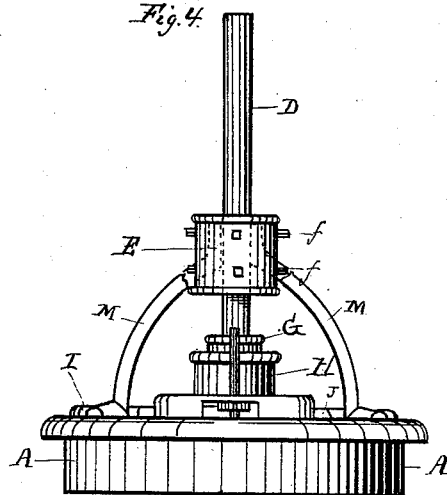


Fig. 3.



WITNESSES
Edwin Bradford
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Fig. 4



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UNITED STATES PATENT OFFICE.

JOHN H. INGRAM, OF ARGUS, ALABAMA.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 303,642, dated August 19, 1884.

Application filed December 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. INGRAM, a citizen of the United States, residing at Argus, in the county of Crenshaw and State of Alabama, have invented certain new and useful Improvements in Water-Wheels, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in turbine water-wheels, and has for its objects to simplify the construction as well as to make all the head of water available. These objects are attained by the mechanism illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view. Fig. 2 is a view taken from the under side of the wheel. Fig. 3 is a section on the line *x x* of Fig. 1. Fig. 4 is a side elevation. Fig. 5 is a section of a bucket.

The letter A indicates the case; B, the wheel. C is the bridge-tree. E is the bearing for the shaft D. G is the follower. H is the stuffing-box. I is the gate. J is the pinion-rack. K is the pinion-shaft. K' is a plate or box covering the top of the pinion K', and forms a bearing for the shaft K. L is the step for the bottom of the shaft D. M are brackets secured at the top to the bearing E and at the bottom to the case A. P are the chutes. Q is the packing of the stuffing-box H.

The case A, with its top A' and stuffing-box H, is a single piece of casting. The object of forming the case, chutes, and stuffing-box of a single casting is to cheapen the manufacture of the wheel, as this obviates the necessity of much labor in fitting the different parts together, and at the same time avoids the employment as well as cost of many bolts. This applies with equal force to casting the wheel and buckets in a single piece, and also to the follower, which, when properly fitted to the stuffing-box, is maintained in its proper position without the use of bolts. The top A' is provided with a series of openings or chutes, P. The gate I is provided with a central opening which surrounds the stuffing-box H, and is composed of a plate having a series of openings, S, which correspond in number

with the chutes P, and has a pinion-rack, J, secured on top by suitable bolts. This rack engages with the pinion K', which is operated by the shaft K, by means of which the gate I may be turned in either direction, so as to regulate the supply of water to the chutes, and thence to the buckets. The wheel B is secured to the vertical shaft D, which passes through the bearing E and follower G, and rests at the bottom on the step L. This wheel is a single casting, in which the openings for the buckets R are made, and correspond in number to the openings in the gate and to the chutes. The face of the buckets is square, and terminates in a gradual curve to the bottom, where the discharge is made. The square surface of the face of the buckets causes an abrupt resistance to the water, which, with the full force of the motion of the water through and over the inclined surface of the discharge, causes the wheel to revolve with great power. When the top of the casing is faced up true and the gate is also faced, it makes the case tight when the gate is closed.

The brackets and bearing E are tapped together and also to the case. The bridge-tree is tapped to the bottom of the case.

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

1. In a turbine wheel, a case, stuffing-box, and chutes, formed of a single casting, in combination with a wheel and buckets of a single piece of metal, having a central shaft secured thereto, provided with a follower, substantially as described, and for the purposes set forth.

2. In a turbine wheel, the case A, having rim A', stuffing-box H, and chutes P, formed of a single casting, and the brackets M, secured to said rim and supporting the bearing E, in combination with shaft D, follower G, step L, and wheel B, provided with buckets, having a cross-section as shown and described, and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. INGRAM.

Witnesses:

I. N. JORDAN,
H. H. HINDS.