

(No Model.)

2 Sheets—Sheet 1.

J. B. McCORMICK, Jr.
TURBINE WATER WHEEL.

No. 554,291.

Patented Feb. 11, 1896.

Fig. 1.

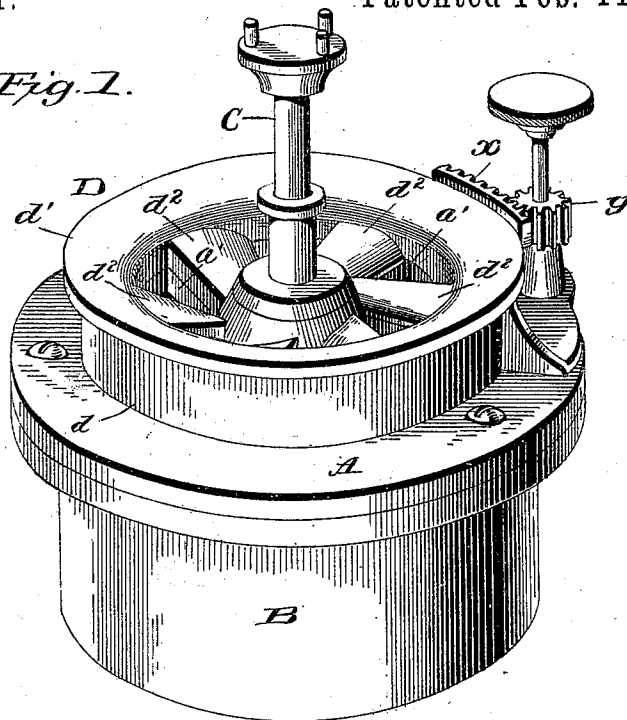
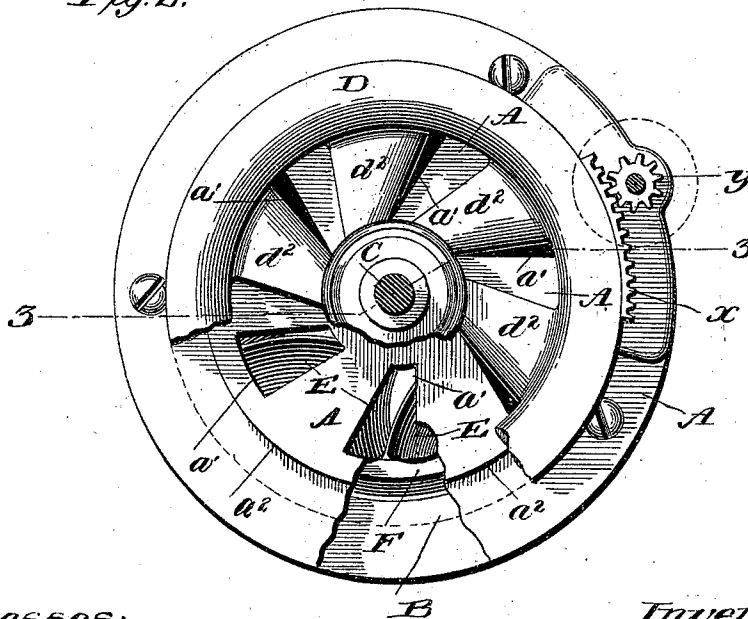


Fig. 2.



Witnesses:

L. C. Hills.

F. B. Keifer

Inventor:

John B. McCormick Jr.,

by Marshall Bailey
his Atty.

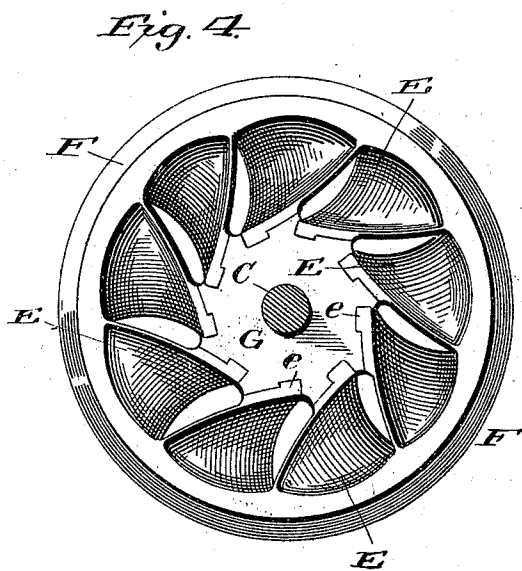
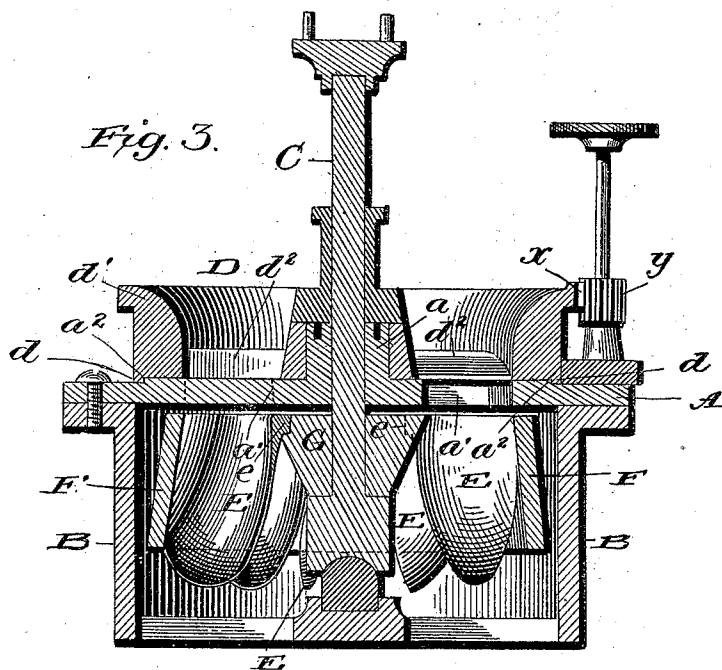
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witnesses:
L. C. Hills.
F. B. Keefe

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UNITED STATES PATENT OFFICE.

JOHN B. McCORMICK, JR., OF YORK, PENNSYLVANIA, ASSIGNOR TO HIMSELF
AND JAMES DIXON, OF SAME PLACE.

TURBINE WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 554,291, dated February 11, 1896.

Application filed July 25, 1895. Serial No. 557,116. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. McCORMICK, Jr., of York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Turbine Water-Wheels, of which the following is a specification.

My invention relates to that class of turbine water-wheels which take the water through the top, the flow of water being regulated by a register-gate operated through the intermediary of a rack and pinion or other suitable instrumentality.

The invention itself consists in an improved construction and arrangement of the parts, which can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the wheel. Fig. 2 is a plan showing the register-gate partly open. Fig. 3 is a section on line 3 3, Fig. 2. Fig. 4 is a plan of the wheel proper. Fig. 5 is a view of one of the buckets.

The top ring A is secured to the flanged top of the cylindrical casing B, which latter at its lower end has spider-arms supporting a central bearing on which is stepped, as usual, the shaft C of the wheel. The shaft passes up centrally through and is journaled in the top ring, which for this purpose is formed with a central hub *a*. It is provided with a series of openings *a'* for the admission of water, which openings are formed in the raised portion *a''* of the top ring, which raised portion is of circular contour and furnishes a seat for the register-gate D. The gate D, which is centered upon the hub *a*, rests upon the raised seat *a* and at its outer edge has an annular flange *d* which fits down around the rim of the seat. I am enabled in this way to seat the gate perfectly and to prevent any liability of its cramping or twisting. The gate is provided with a flaring curb *d'*, which meets and in effect merges into the arms or spokes *d''* between the openings in the gate, these arms being beveled downwardly in a direction to cause the water to be directed toward the concave faces of the buckets of the wheel. The gate has the same number of openings as the top ring, and the openings in both ring and gate widen as they approach the periphery.

The front edge of each beveled arm *d''* (this edge being the rear edge of the register-opening just in front of that arm) is so inclined with respect to the front edge of the opening in the top ring which the arm closes that when the register-gate is moved in a direction to admit the water the arms will first uncover the outer portions of the openings in the top ring, as indicated in Fig. 2, so that the water as it enters will be directed against the outer portion or rim of the wheel, thus bringing the power to bear at once upon that portion of the wheel where it will act most efficiently to start the latter.

The gate is operated by any suitable known means typified by the rack *x* and pinion *y*.

The wheel itself consists of the buckets E, the annular rim F, and the hub G. One of the buckets is shown detached in Fig. 5. It is concavo-convex with its outer edge bent in a somewhat spiral path toward the inner edge, and in its finished condition has an approximately triangular outline. By this form of bucket the water which the bucket received is discharged directly downward from the wheel. At its inner upper corner the bucket has a tenon, projection, or enlargement *e* by which it is more securely held to the hub. Its outer edge is secured throughout its length to the rim F. Thus the buckets are attached at their upper ends only to the hub, while their outer edges are secured throughout their length to the rim. In practice I cast the rim around the buckets, and at the same operation cast the hub upon and around the enlargements or tenons *e*, by which means the buckets are firmly held to and in effect dovetailed into the hub, as indicated in Fig. 4. The method of casting the wheel is not here claimed, but forms the subject of an application in my name of even date herewith, Serial No. 557,117.

Having described my improvements, what I claim herein as new and of my own invention is as follows:

1. The register-gate D formed with the beveled arms *d''* and annular flaring curb *d'* merging into said arms, in combination with the top ring provided with openings corresponding to those in the register, the front edges of the arms being inclined relatively to

the front edges of the openings in the top ring closed by said arms in the manner described, the parts being constructed and arranged as hereinbefore shown and set forth.

- 5 2. The rim F and hub G in combination with the buckets E of substantially the form shown secured to the hub at their upper inner corners only, and along their outer edges to

the rim, as and for the purposes hereinbefore shown and described. 10

In testimony whereof I have hereunto set my hand this 22d day of July, 1895.

JOHN B. McCORMICK, JR.

Witnesses:

W. F. HENDRIX,

M. N. LEHMAYER.