

W. MERCER.
Turbine Water-Wheels.

No. 164,927.

Patented June 29, 1875.

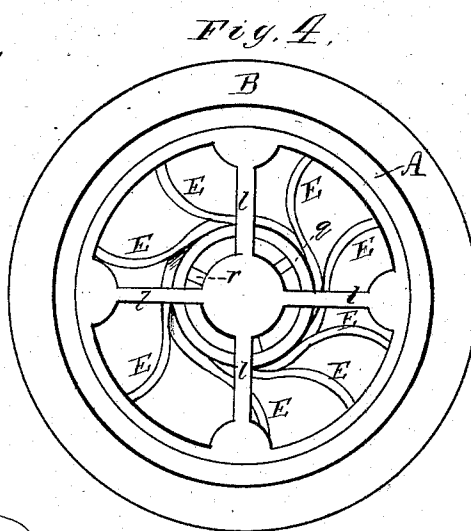
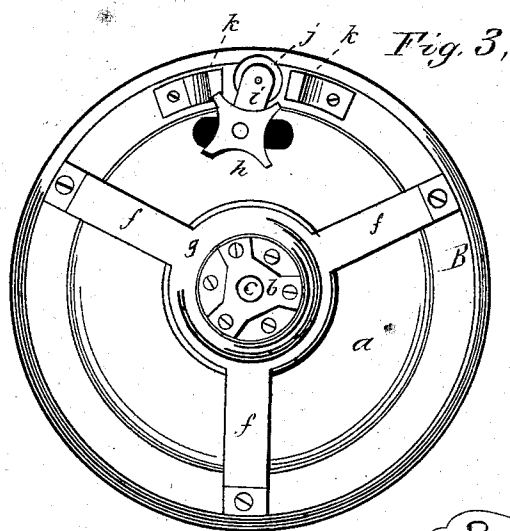
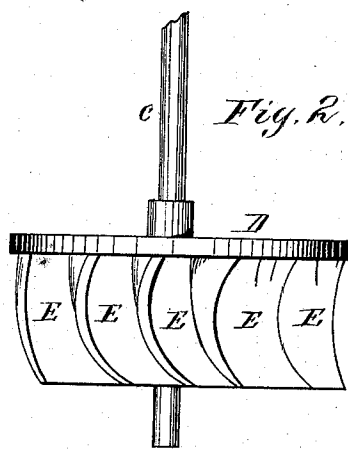
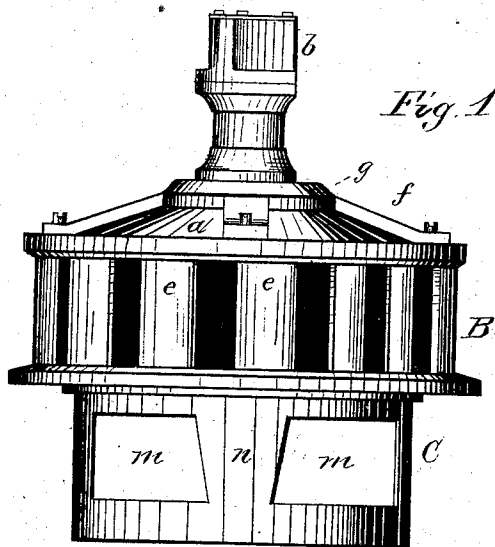
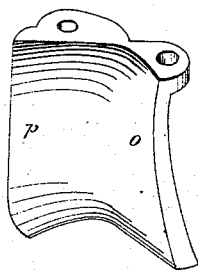


Fig. 5.



WITNESSES:

Wm. E. Cliphams
Grenville Lewis

INVENTOR.

William Mercer.
per Charles H. Fowlen
ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM MERCER, OF CHRISTIANA, PENNSYLVANIA.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **164,927**, dated June 29, 1875; application filed April 8, 1875.

To all whom it may concern:

Be it known that I, WILLIAM MERCER, of Christiana, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Turbine Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a perspective view of my invention; Fig. 2, a detached view of the buckets, showing them connected to the plate and shaft; Fig. 3, a plan or top view; Fig. 4, a view showing the under side of the wheel; Fig. 5, a detached view of one of the buckets.

This invention has relation to turbine water-wheels; and consists in the peculiar shape of the buckets, whereby they form, when placed together, a continuous inside wall of the wheel, as will be hereinafter more fully set forth.

In the drawing, A is designed to represent the interior casing of the water-wheel, provided with the usual chutes or water-passages, and constructed with a dome, *a*, and having separate from the same a follower-box, *b*, and in the interior thereof a stuffing-box, through which the shaft *c* of the wheel passes. The bottom of this follower-box constitutes the top of said stuffing-box, and prevents the waste of water therefrom. The gate or outer casing B has connected to its upper rim arms *f*, the same being connected to the encircling ring *g*, which rests upon the dome *a*, and revolves around the same. This gate B is operated by means of an upright shaft, *h*, on the lower end of which is placed a horizontal arm, *i*, carrying a friction-roller, *j*, bearing against shoulders or projections *k*, rigidly connected to the upper rim of the gate. The wheel-casing A is extended below the lower rim of the gate, as shown at C, upon which the entire wheel rests, and is fast to the bottom of the curbing.

Connected to the extension C are arms *l*, and having at their center the usual step, upon which the wheel turns. By this arrangement the weight of the wheel, resting upon the extension C on the sheeting of the race, takes the weight off of the pen-stock, and permits a greater distance of fall, as it allows the water to pass out of the openings *m*, formed by the partition-plates *n*. The wheel is constructed of a simple flat circular plate, D, and has placed at its center a boss of sufficient size to admit of its being fastened upon the shaft *c*. Around the lower end of this plate is secured a series of buckets, E, the same being of such form that when placed together their inner curvature, as shown at *o*, Fig. 5, shall form a continuous inside wall of the wheel, while the outside curvature, as shown at *p*, is such that when the water strikes it it produces an upward tendency, and relieves the pressure on the step, thereby materially lessening the friction, and enabling the wheel to run lighter than it would otherwise. After the buckets are connected to the plate D, and in their relative positions, there is placed in the central opening formed by said buckets a ring, *q*, retained in place by means of bolts *r* and jam-nuts, which rest against the shaft *c*, the purpose of which is to strengthen the buckets and keep them in their relative positions.

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

1. The buckets E of the form shown and described, so that when placed together their inner curvature shall form the wall of the wheel, as specified.

2. The wheel, substantially as herein described, consisting of the buckets E, plate D, ring *q*, and bolts *r*, as set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

WILLIAM MERCER.

Witnesses:

BRINTON WALTER,
ELLIE MERCER.