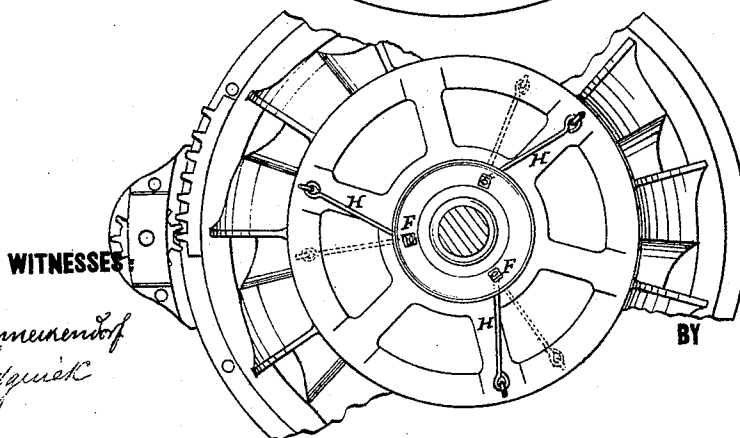
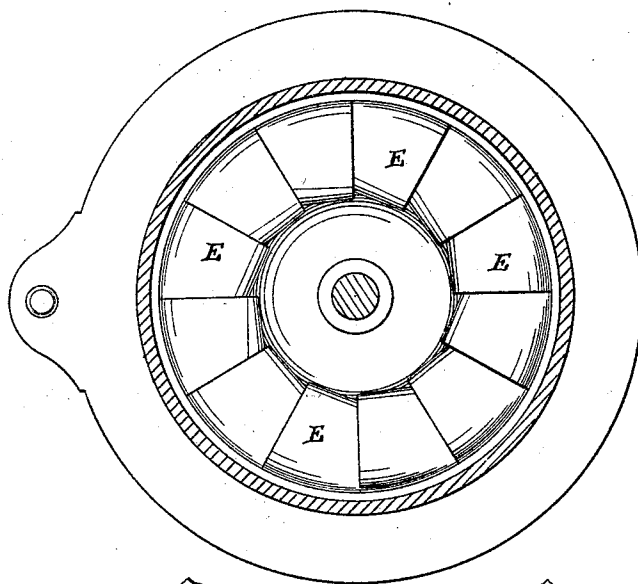
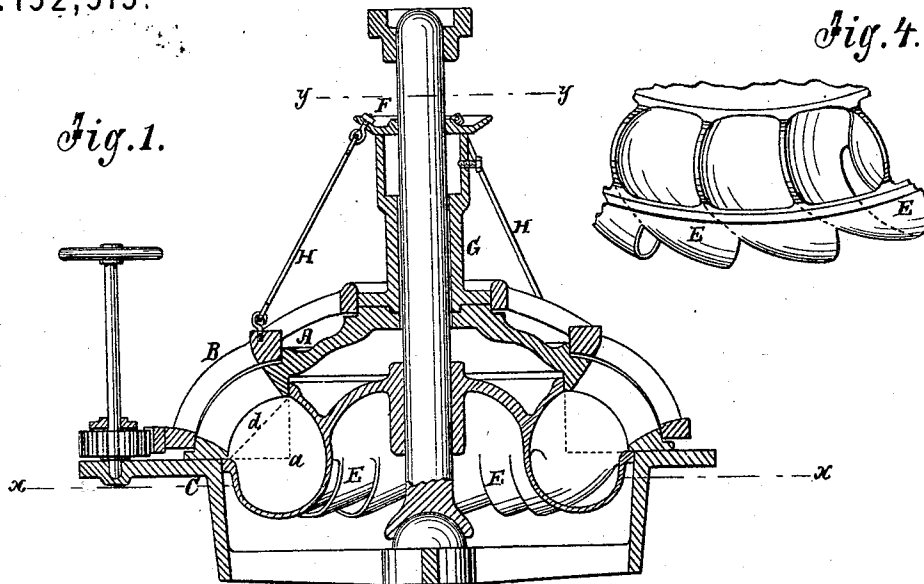


J. W. ROSS.
Water-Wheels.

No. 152,515.

Patented June 30, 1874.



WITNESSES:

A. Remondet & Co.
Engineers

INVENTOR:

J. W. Ross
BY *[Signature]*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN W. ROSS, OF DELPHOS, OHIO.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **152,515**, dated June 30, 1874; application filed April 11, 1874.

To all whom it may concern:

Be it known that I, JOHN W. ROSS, of Delphos, Allen county, Ohio, have invented a new and Improved Turbine Water-Wheel, of which the following is a specification:

My invention relates to a turbine-wheel in which the buckets are arranged to admit the water at an angle of ninety degrees, between a horizontal and a vertical line; and it relates to the form or construction of said buckets, as hereinafter described.

Figure 1 is a transverse sectional elevation of my improved wheel. Fig. 2 is a horizontal section taken on the line *x x*, Fig. 1. Fig. 3 is a top view of the wheel with the shaft sectioned on the line *y y*, Fig. 1; and Fig. 4 is a detail in perspective view.

Similar letters of reference indicate corresponding parts.

A represents the upper case; B, the chutes; C, the lower case, and E the buckets. From the top of the chute-rim to the bottom it is made in dome-shape on a true curve of ninety degrees, or thereabout, between a vertical and a horizontal line, being struck from a center, *a*. The buckets are formed at the upper end on the inner curve of this dome-shaped chute-rim, and they are concaved in cross-section on a radius a little smaller than their breadth at the top. From the top they widen downward, so that from the quarter-circle of the top they increase to nearly three-quarters at the lower end, where, by their spiral curve, they come to the form of an upright trough, from which they discharge the water directly downward. By this curved or dome-shaped form of the chute-rim and the upper end of the buckets, combined with the concave shape of the body of the buckets, the water is delivered to the wheel to the very best advantage, flowing direct and in solid columns, in which it is most effective.

The plan is better than a straight incline

from top to bottom of the chutes, and the upper end of the buckets, because it conforms more to the natural action of the water in rushing to the buckets in different angles, converging at the entrance. It gives an increased area to the bucket by the addition of the arc *d* above the right line between the upper and lower corners, whenever the water acts and gathers into the trough-shaped body of the bucket in solid volume, whether on full or part gate, giving better results, particularly in the latter case, in which all wheels fail to show the due proportion of effect to the water used.

For causing the gate to rise off the chute-rim a little when it opens, and free the matters settling in the joint between them, I connect it with a stationary collar, F, on the top of the packing-hub G of the case, by jointed rods H, which are to be adjusted so that they will come into radial planes of the wheel when the gate is closed, and thus let it fall to the lowest point of which they are capable, so that when the gate is opened by swinging out of said planes, they will raise it a little, and thus afford the means of escape for any small particles of matter lodging between it and the chute-rim at any time, and thus keep it clean. The gate is also more easily operated by this means, as the friction is prevented by the gate being lifted off the chute-rim.

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

The water-wheel, provided with buckets formed at the upper end on a curve of ninety degrees, or thereabout, and made concave on the bottom longitudinally, as shown and described.

JOHN W. ROSS.

Witnesses:

T. B. MOSHER,
C. SEDGWICK.