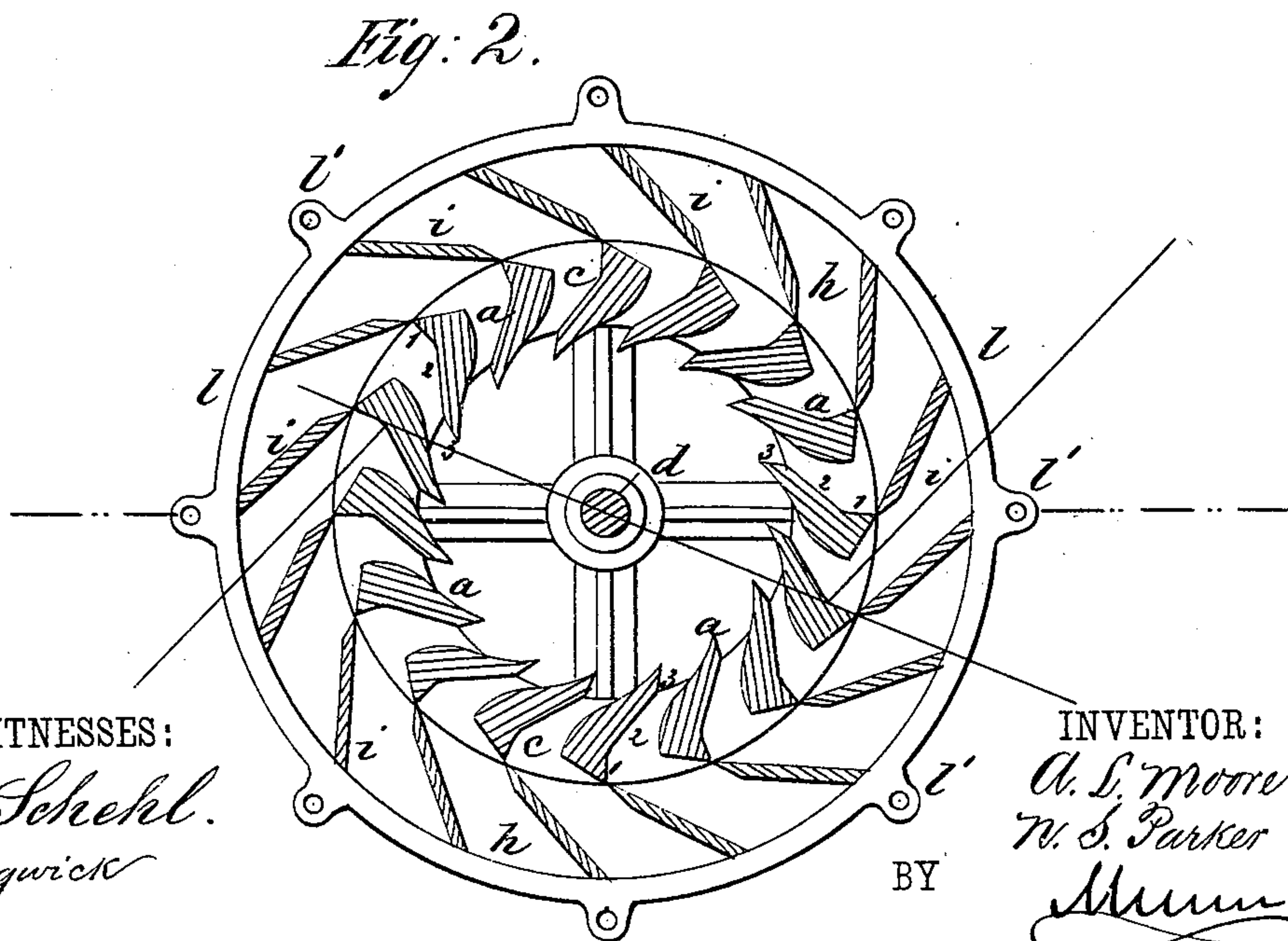
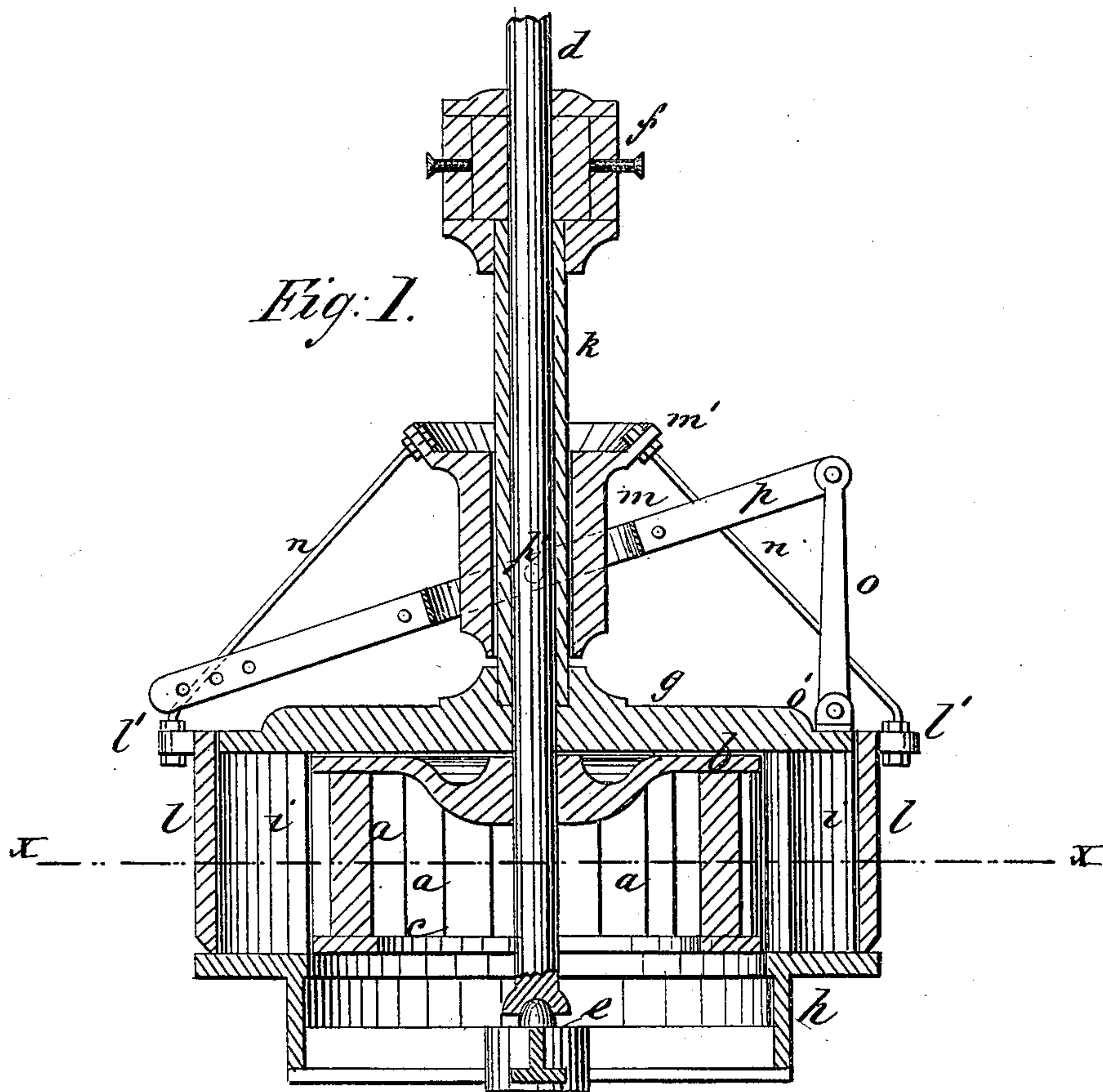


A. L. MOORE & N. S. PARKER.  
Turbine Water Wheel.

No. 231,079.

Patented Aug. 10, 1880.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ALBERT L. MOORE AND NORMAN S. PARKER, OF PORTLAND, OREGON.

## TURBINE WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 231,079, dated August 10, 1880.

Application filed November 10, 1879.

*To all whom it may concern:*

Be it known that we, ALBERT L. MOORE and NORMAN S. PARKER, of Portland, Multnomah county, State of Oregon, have invented a new and useful Improvement in Water-Wheels, of which the following is a specification.

Our present invention is an improvement upon the water-wheel for which Letters Patent were granted to us January 17, 1871; and the object of our improvements is to obtain both percussive and reactionary effect by the water upon the wheel; and, further, to construct the gate so that it may be more easily operated than rim-gates as heretofore made.

Our invention consists in a wheel having inlet-chutes arranged tangential to the outer circle of the wheel, and buckets formed with their back faces next to the chutes and at the inner ends with reverse angles or at right angles to the direction of the water, and at the front with a bulge that narrows the water-space between the buckets, so that the water first strikes the buckets at right angles, and is discharged at right angles to the inlet.

Figure 1 is a central vertical section of a water-wheel constructed in accordance with our invention. Fig. 2 is a vertical plan view of the same on line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

The wheel consists of buckets *a*, sustained between the top plate, *b*, and bottom ring, *c*, upon the spindle *d*, which rests on the step *e*, and is sustained above the wheel by the fixed bearing *f*.

The casing consists of a top plate, *g*, and flanged bottom ring, *h*, between which are sustained the partitions *i*, forming the inlet-chutes around the wheel. From the top plate, *g*, and around the spindle *d* is a sleeve, *k*, that sustains the bearing *f*.

The gate *l* is made as a ring that sets around the outside of the case, and when closed rests on the bottom ring, *h*.

Around the sleeve *k* is a loose collar or sleeve, *m*, formed at its upper end with a flange, *m'*, as shown, or with a series of legs or projections in place of the flange, from which rods

*n* extend to lugs *l'*, which are formed at the upper edge of the gate. These rods are secured at their ends by nuts, so that the gate *l* and collar *m* are connected together firmly.

Upon the top plate, *g*, of the case is a standard, *o*, hung in lugs *o'*, so that it may swing on its connection, and to the upper end of *o* is hung a lever, *p*, that is forked or formed with an eye, through which the collar *m* passes, the collar *m* being hung to the lever by pins or screws *p'*. By this construction the lever *p* is adapted for use in raising the gate, and the standard *o* becomes a movable fulcrum for the lever *p*.

The partitions *i*, forming the inlet-chutes, are set at a tangent to the circle described by the outer edges of the buckets, the direction of each partition being about at right angles to a radial line from its inner point to the center of the wheel.

The buckets *a* are formed on the back face, against which the water strikes with reverse angles—that is, from the outer edge the portion 1 extends inward on a radial line, or about at right angles to the adjoining partitions *i*, the portion 2 extends back of the radial line at an obtuse angle to 1, and the inner point is formed by the bevel 3, which extends forward at an obtuse angle to 2. The outer end of each bucket is formed straight in a line which is the continuation of the partitions *i*. The face of the bucket is curved forward to form a bulge that narrows down the space between the buckets and curved back to form a point with the line 3 at the inner end.

The buckets are made long enough to permit their inner end to project beyond the inner periphery of the bottom ring, *c*, so that these ends project over the water-outlet.

From the above description it will be observed that our buckets are placed over the inward rim of the wheel, have three distinct angles, and allow the water three actions—the stroke, reaction, and suction.

The convexity on the back of our buckets allows a concavity on the inside, which gives the water a good clearance, without friction, at the point of issue. This wheel will work well with comparatively little water.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

5 In a water-wheel, the buckets having a portion, 1, extended inwardly on a radial line at right angles to partition *i*, the portion 2 extended back at an obtuse angle to portion 1, and the portion 3 beveled and placed at an obtuse angle to portion 2, as shown and de-

scribed, whereby the water has three actions 10 on the buckets—the stroke, reaction, and suction.

ALBERT L. MOORE.  
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Witnesses:

B. W. BYLER,  
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