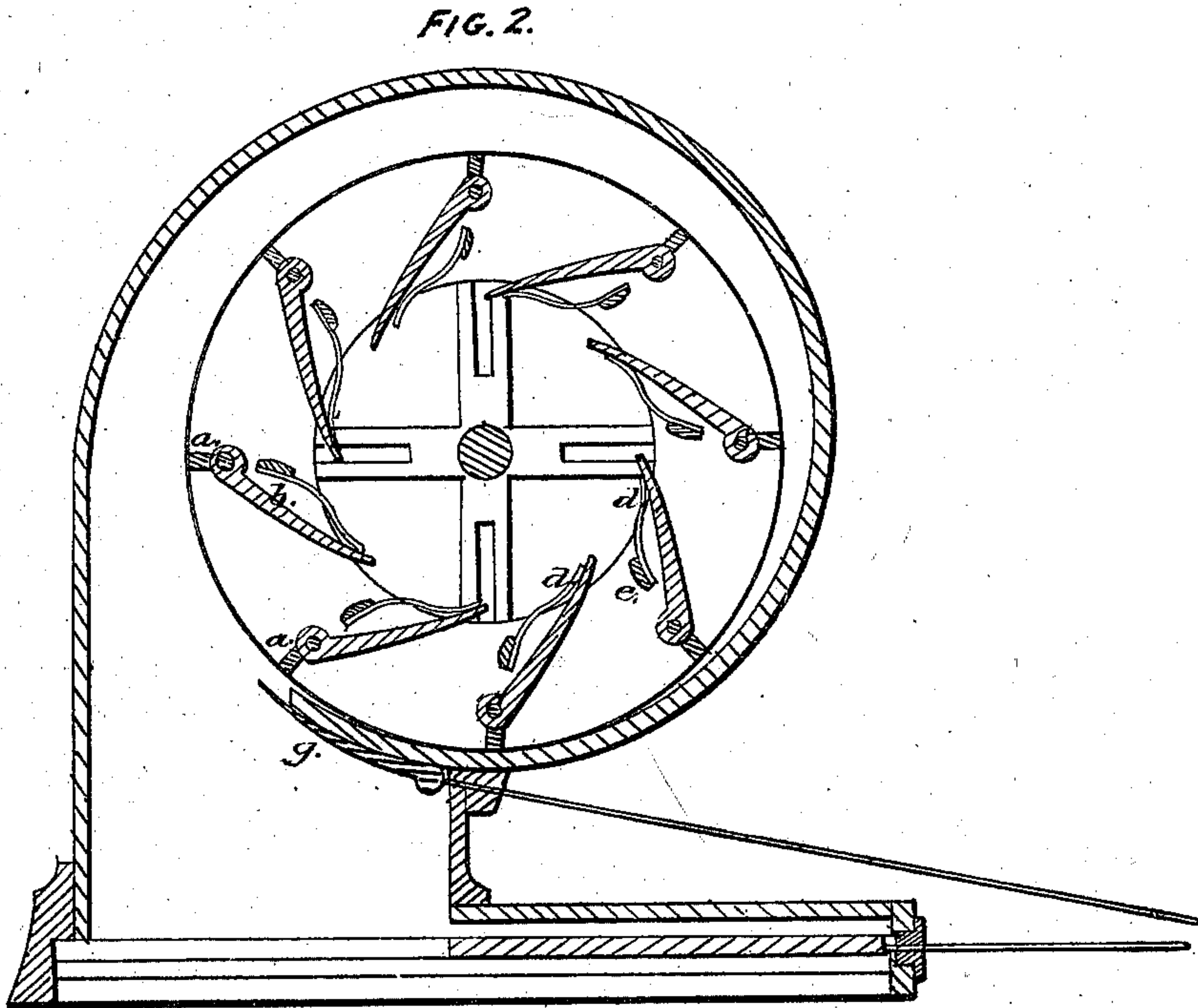
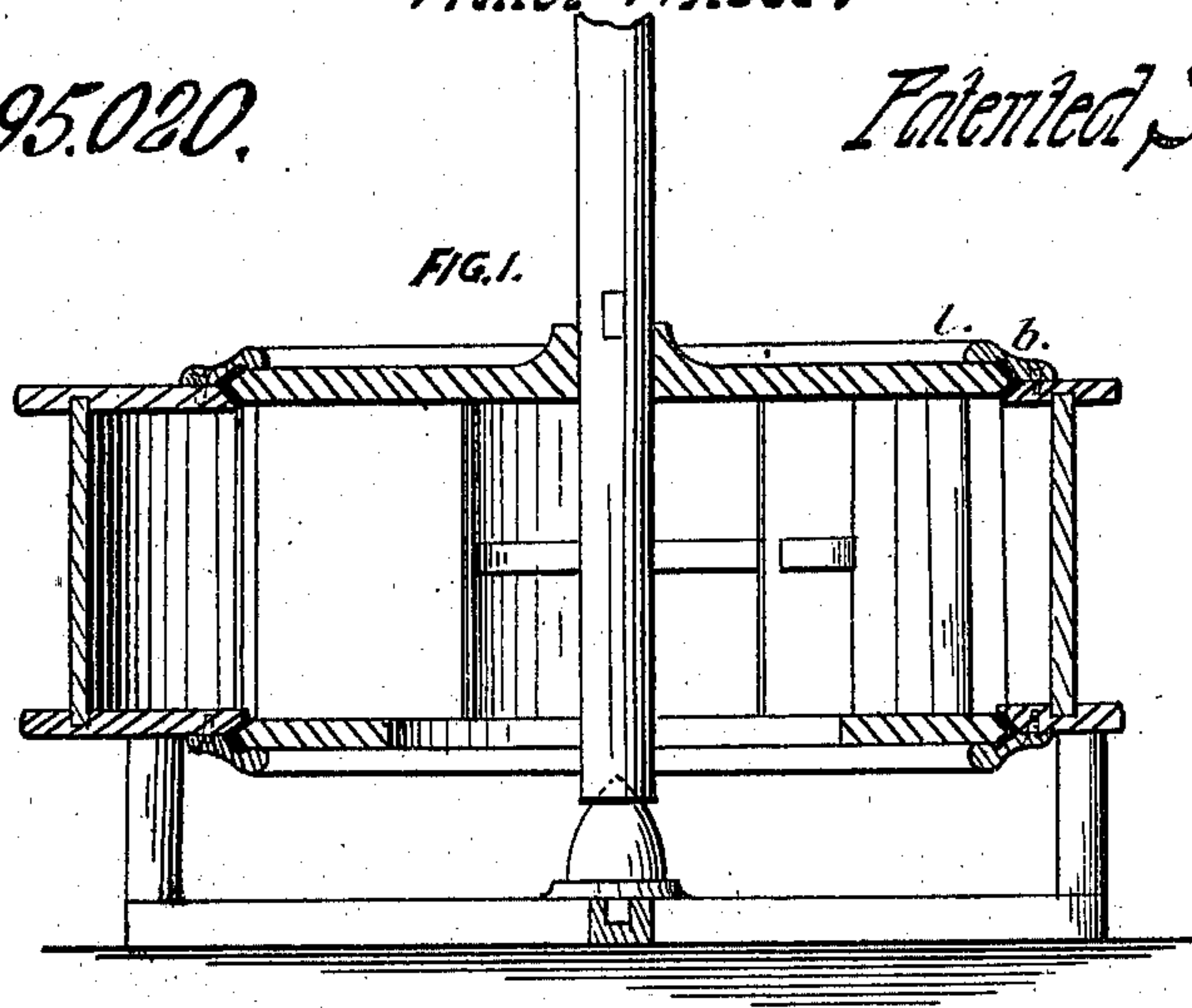


W.E. Hill,

Water Wheel.

No. 95,020.

Patented Sept. 21, 1869.



WITNESSES:

Hirschman.
Geo. L. Brooks

INVENTOR:

W.E. Hill
by
Wm. L. S.
attorney.

United States Patent Office.

WILLIAM E. HILL, OF RENOVO, PENNSYLVANIA.

Letters Patent No. 95,020, dated September 21, 1869.

IMPROVEMENT IN WATER-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM E. HILL, of Renovo, in the county of Clinton, and State of Pennsylvania, have invented a new and useful Improvement in 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 make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to improvements in turbine water-wheels, whereby it is designed to improve the efficacy of the same.

The invention consists in an improved arrangement of buckets, designed to cause both a direct and reacting application of the water; that portion of the buckets designed for the reacting application of the water being made adjustable by the action of springs, to vary the discharge-orifices, as the volume of water or the resistance of the wheel changes.

It also consists in an improved arrangement of the gates, and also in an arrangement for packing the joints between the wheel and the scroll.

Figure 1 represents a transverse sectional elevation, and

Figure 2 represents a horizontal section of my improved wheel.

Similar letters of reference indicate corresponding parts.

I make the buckets in two parts, *a* and *b*, the parts *a* being fixed near the outer edges of the rims in radial lines, and the parts *b* being hinged at their points of contact with the parts *a*, and adjusted tangentially, or thereabout, to the curvature of the inner circle of the rims.

The inner ends of the parts *b* are free to swing on the pivots *c*. The said parts *b* are curved, presenting a convex surface to the water as it passes beyond the parts *a*.

Behind these parts *b*, springs *d*, secured to studs *e*,

are arranged, to bear upon the free ends in a manner to cause the parts *b* to close the issues.

The object of this arrangement is to adapt the capacity of the issues to the volume of water passing through the wheel, or to the resistance upon the wheel, to close them when the volume is small, so as to obtain the reactive force thereof, or to open when the volume is large; or if the resistance upon the wheel increases so as to reduce its speed, the buckets will open under the increased pressure of the water, to allow a greater amount to pass through, and thereby exert a greater power to overcome the resistance.

As a further means of regulating the flow of water, I provide, in addition to the outer gate *f*, the curved inner gate *g*, whereby the volume of water may be better adjusted to the capacity of the buckets to pass it.

I propose to pack the joints between the wheel and the scroll by means of grooves in the one lined with India-rubber packing, and corresponding V-projections, on the other, as represented at *h*, and as a simple means of forming the said grooves, I provide the rings *i*, upon the upper and lower parts of the scroll, and form the said grooves, half in each.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The buckets, composed of the fixed and movable parts, and the latter provided with springs, all substantially as specified.

2. The gates *f g*, arranged and combined with the wheel, having buckets arranged substantially as herein specified.

3. In combination with the wheel and scroll, the V-grooves lined with India rubber, and arranged with the V-projections of the wheel, as specified.

Witnesses:

JOSEPH WHITBY,
JAS. O'HAGAN.

WM. E. HILL.