

J. E. WHITING.
Turbine Water-Wheels.

No. 143,312.

Patented September 30, 1873.

Fig. 1.

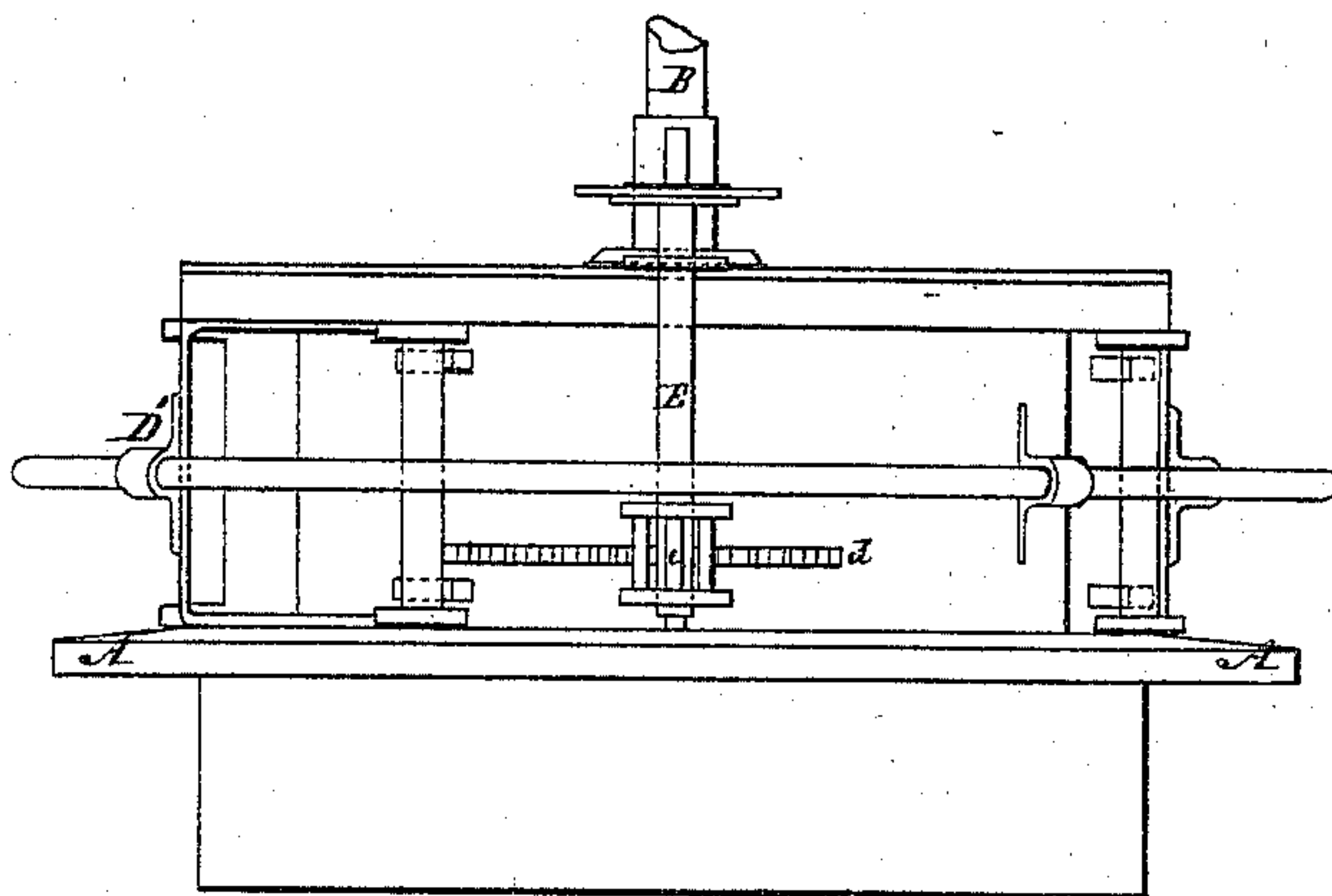
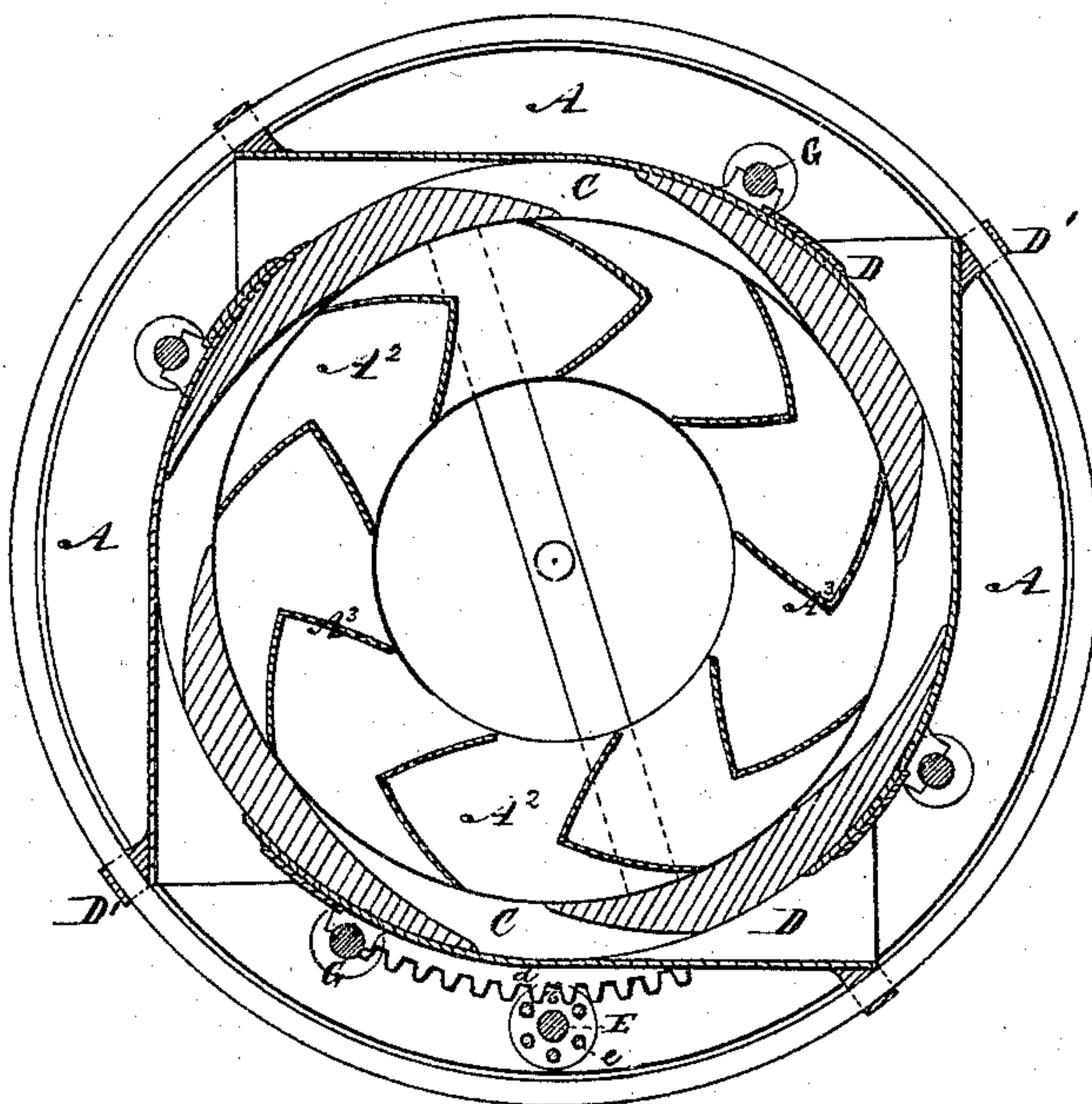


Fig. 2.



Witnesses,
Alf. Westbrook

Wm. C. Day

Inventor.

J. E. Whiting,
by his attorney J. S. Stetson.

UNITED STATES PATENT OFFICE.

JOSEPH E. WHITING, OF HARFORD, PENNSYLVANIA.

IMPROVEMENT IN TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. **143,312**, dated September 30, 1873; application filed March 7, 1873.

To all whom it may concern:

Be it known that I, J. E. WHITING, of Harford, Susquehanna county, Pennsylvania, have invented certain new and useful Improvements relating to Turbine Water-Wheels, of which the following is a specification:

To enable others skilled in the art to make and use the invention, I will proceed to describe what I consider the best means of carrying it out.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation, and Fig. 2 is a horizontal section.

Similar letters of reference indicate like parts in all the figures.

A denotes a fixed frame-work, and B an upright shaft supported therein, carrying the wheel, the several parts of which are marked $A^1 A^2$. The top plate A^1 is close or continuous; the bottom plate A^2 is open in the center; and the buckets or floats A^3 are bent, as shown. A series of fixed chutes, C, are mounted in the frame-work A, and adapted to direct the water tangentially in its introduction to the wheel. The inner edges of the chutes C are fitted very closely to the periphery of the wheel, which revolves freely within it. A series of chutes, D, are mounted in a ring exterior to the fixed chutes C, and the entire ring D is capable of being turned to a limited extent around the entire parts inclosed. A segment, d , on a portion of its periphery receives the teeth e of a shaft, E, which is adapted to be turned by hand or otherwise in one direction or the other to set the adjustable ring of chutes D in any desired position. G G are anti-friction wheels carried on the ring D and traversing on suitable continuous surfaces on the inclosed work C.

I have represented four chutes in the adjustable series D and a corresponding number of pairs of anti-friction wheels, G; the number may be made somewhat more or less.

The chutes in the adjustable series D are spread out and are somewhat flared at their outer ends to receive the water very freely. A ring, D' , serves to brace and support these parts.

The whole wheel is intended to be inclosed in a suitable pen-stock, not represented.

The water may be admitted to the pen-stock with a slight rotatory motion in the direction proper to promote its entrance into the mouths of the chutes in the series D.

The relation of the movable series of chutes D to the fixed chutes C changes as the series D is adjusted in one direction or the other, and thereby controls the amount of water admitted to the wheel, while the portion admitted is always allowed to enter with its full force and effect. The anti-friction wheels G allow the series D, which performs the function of a ring-gate, to be adjusted with ease.

Mill-governors of ordinary power may operate the gate for a powerful wheel working under a strong head.

The position of the buckets is such that one completely cuts off the sheet of water issuing from a chute at the same time that another enters the next sheet forward, so that the streams from the several chutes act independently of each other, and the varying actions during the movement of each bucket across a chute is distributed at different times on different portions of the wheel, so that the force of the wheel is very uniform. The water which comes into one chute cannot pass to the other without applying its force to the wheel. The shape of the buckets and the action of the water upon them are such as to utilize, first, reaction of centrifugal force of water; second, direct action of water; third, reaction of discharge; thus it may be said that the water is used three times.

I claim as my invention—

The fixed series of chutes C and revolving series D with means for easily adjusting the latter, combined and arranged relatively to each other and to an inclosed turbine wheel, as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand this 20th day of February, 1873, in the presence of two subscribing witnesses.

JOSEPH E. WHITING.

Witnesses:

EDWARD M. OSBORN,
R. R. THATCHER.