

S. P. & O. H. CASTLE.
Water-Wheels.

No. 126,786.

Patented May 14, 1872.

Fig 1.

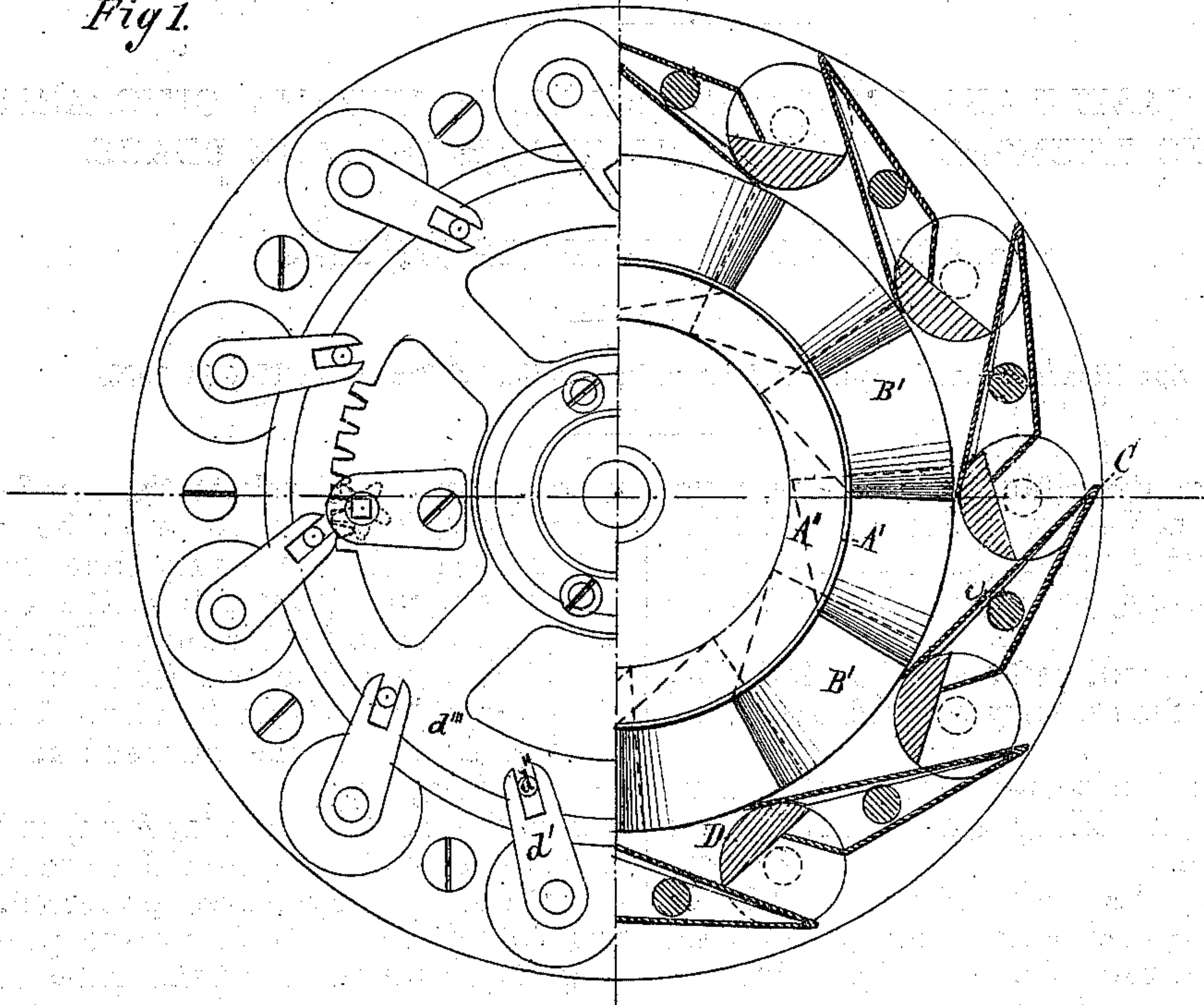
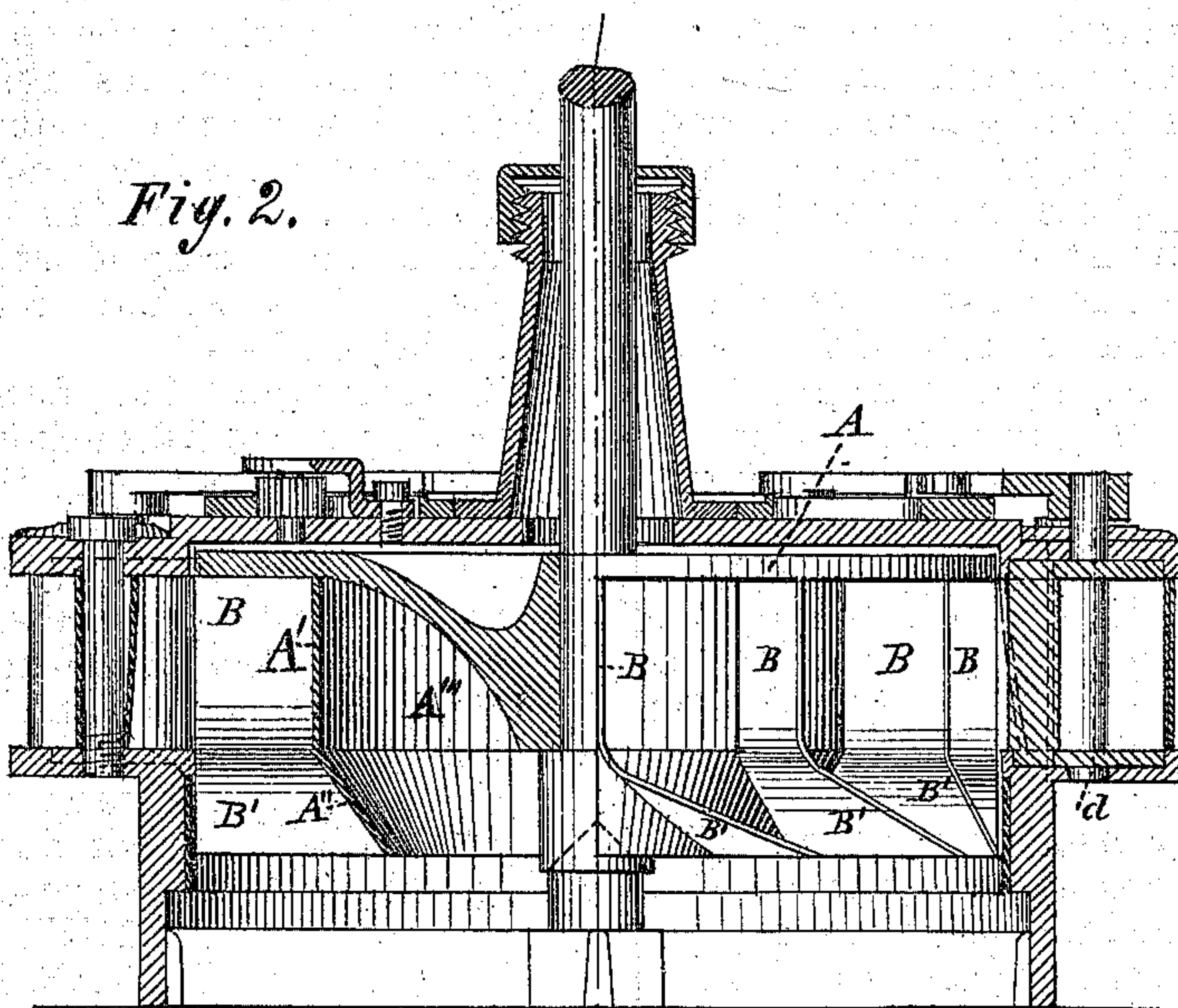


Fig. 2.



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SAMUEL P. CASTLE AND OLIVER H. CASTLE, OF URBANA, OHIO, ASSIGNORS
TO THEMSELVES AND M. H. CRANE, OF SAME PLACE.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 126,786, dated May 14, 1872.

Specification describing certain Improvements in Water-Wheels, invented by SAMUEL P. CASTLE and OLIVER H. CASTLE, of Urbana, in the county of Champaign and State of Ohio.

The invention will be hereinafter first fully described and then clearly pointed out in the claims.

Figure 1 is a horizontal section of chutes, gates, and wheel. Fig. 2 is a diametrical and vertical section.

A represents the wheel, of which A^1 is the hub. This is formed of an upper cylinder, A^1 , and a lower frustum of a cone, A^2 . This cylinder A^1 and cone A^2 are closed at all points, and form an intermediate air-chamber, A^3 . B are radial buckets, placed on cylinder A^1 , so as to receive the water tangentially, while B' are discharge-aprons, forming a part thereof, and bending backward to guide the dead water from the wheel. These aprons are placed upon the cone frustum A^2 obliquely.

The advantage in this construction of the hub is that while the outer edges of the buckets B and aprons B' are equally distant from the center of motion, the discharge aperture is greatly increased, and the dead water discharged with much greater facility.

C are stationary hollow chutes, whose outer ends are vertical, the inner end at the top being inclined forward toward the center of the wheel, this inclination of the tangential inner guiding-surface c being gradual from the outer to the inner end of the chute.

The reason of this construction is that water flows with slightly greater velocity at the bottom and with a decreasing velocity toward the top according to the head or pressure. Hence, if the same volume of water is thrown upon the buckets throughout their whole height, the unequally applied stratum imparts unequal

pressure upon the buckets, thereby decreasing the power. The inclination of the inner and upper end of the stationary chute causes the upper stratum of water to strike the bucket as soon as the lower stratum. By this means the wheel is found in practice to run with complete steadiness and uniformity. This hollow chute C is open on the inner end and receives therein the gate.

D is the gate, of circular form, and turning on pivot d , so as to open and close in front of the chutes to any degree preferred. d^1 are end-slotted arms, which receive pins d^2 of a ring, d^3 , by which all of the gates are simultaneously moved.

The advantage of this form of adjustable gates, swinging within the open chute, is that they use up no space desirable for other purposes, and interpose no obstacle at any point of adjustment to the free passage of the water.

Having thus described all that is necessary to a full understanding of our invention, what we claim to be new, and desire to secure by Letters Patent, is—

1. A water-wheel hub, formed of cylinder A^1 receiving the radial buckets, and the conical frustum A receiving the discharge-aprons, as and for the purpose described.

2. The stationary hollow chutes C of a water-wheel, having their inner ends and surface c gradually inclined forward at the top toward the axis of the wheel, as and for the purpose set forth.

3. The gates D of a water-wheel pivoted at the inner end of and swinging within hollow chutes, as and for the purpose described.

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