

B. I. Talbott.

Gate for Water Wheel.

N<sup>o</sup> 93,130.

Patented Jul 27, 1869.

Fig. 1.

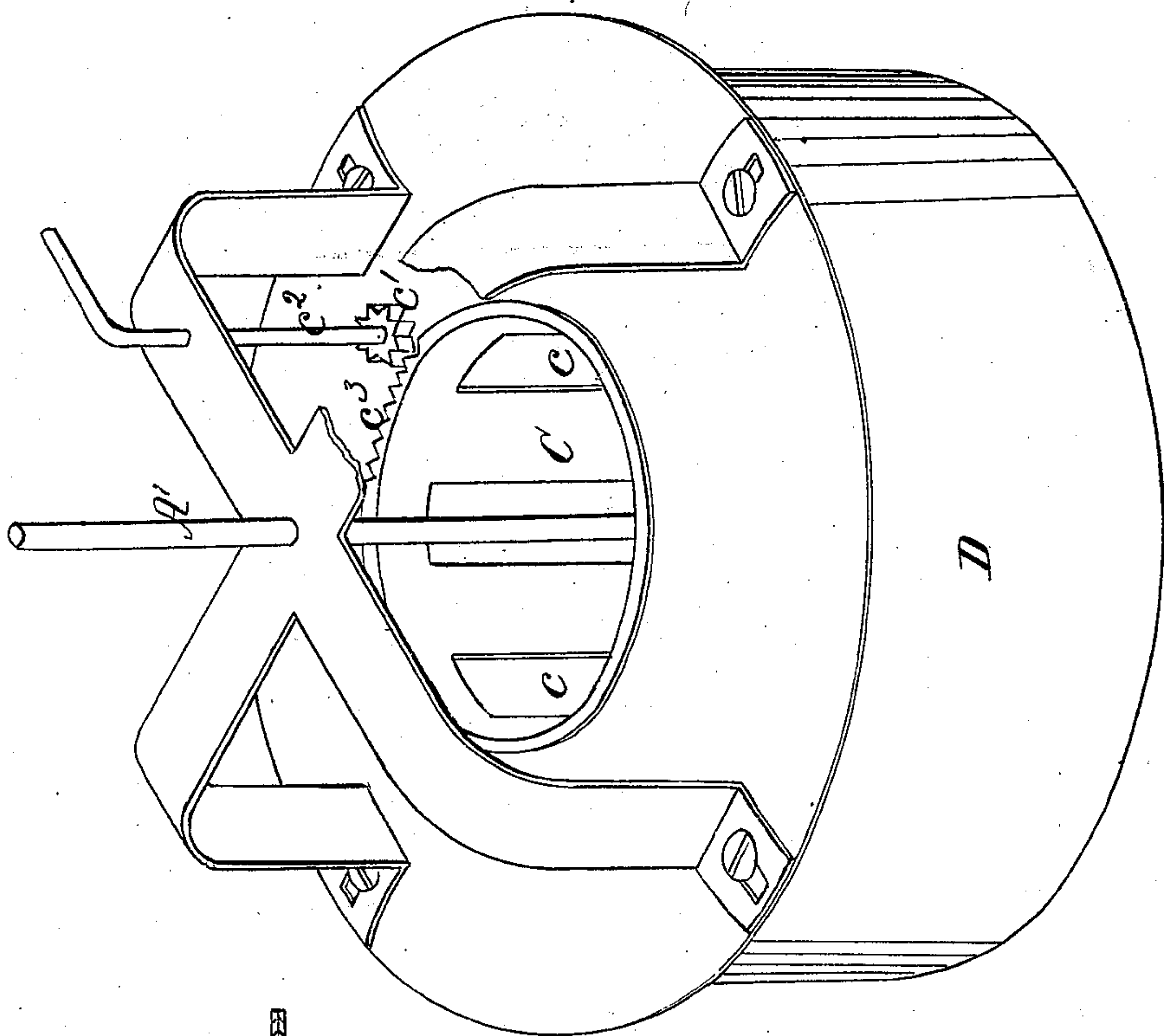
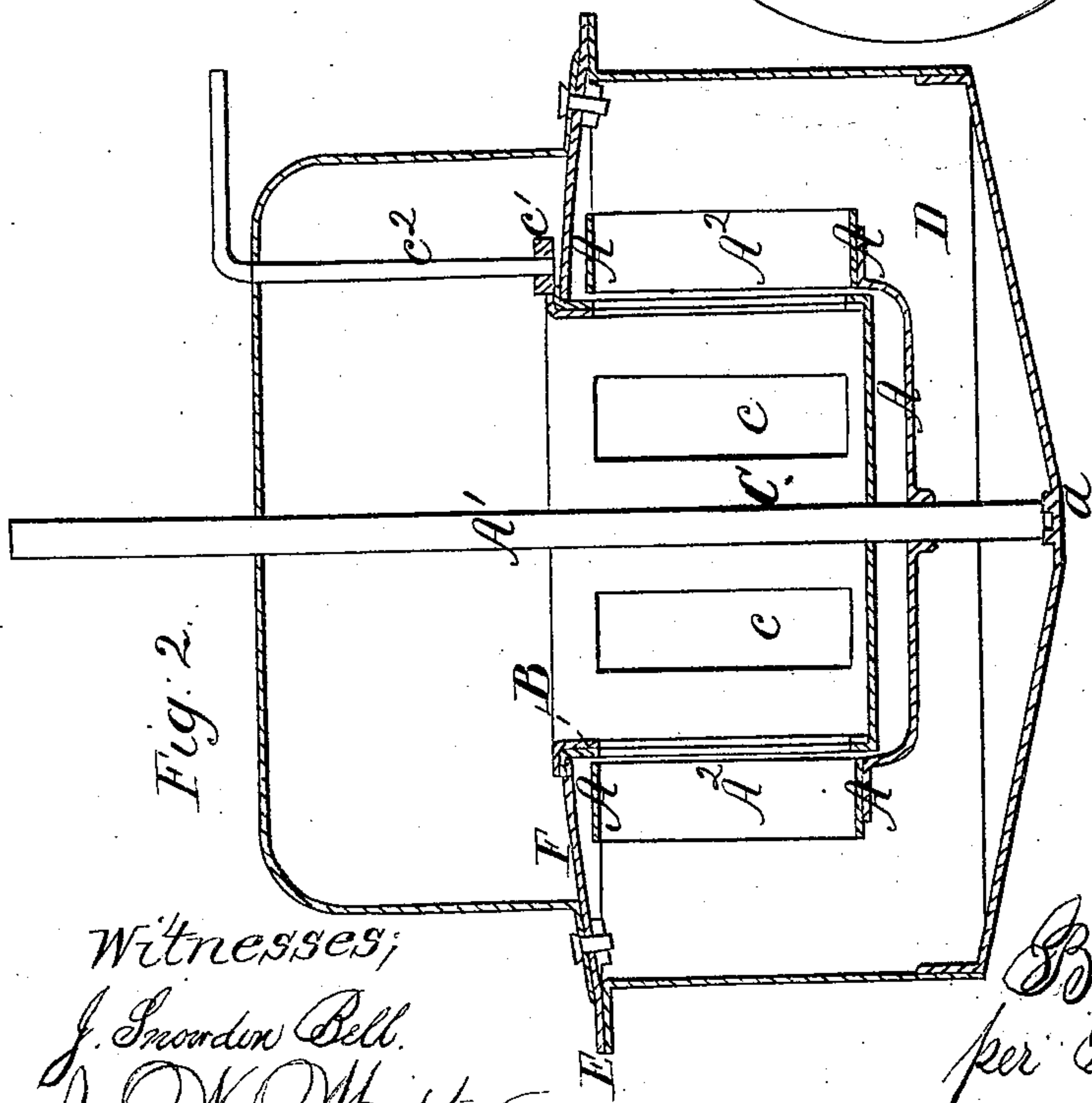


Fig. 2.



Witnesses;

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# United States Patent Office.

BENJAMIN I. TALBOTT, OF IOWA FALLS, IOWA.

Letters Patent No. 93,136, dated July 27, 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, BENJAMIN I. TALBOTT, of Iowa Falls, Hardin county, State of Iowa, have invented certain new and useful Improvements in Water-Wheels, and their appurtenances; and I do hereby declare that the same are described and represented in the following description and accompanying drawings, so as to enable any person skilled in the art to make and use the same, without further invention or experiment.

The object of my invention and improvements is to so arrange and construct a water-wheel and its appurtenances, that it, with its gate, curb, and immediate surroundings, may be made in few pieces and completed and put together at the foundry, or machine-shop, ready for use, and be transported whole, so that when it arrives at its destination a hole may be cut in the bottom of a box or flume, and the wheel set into it, and it will then be ready for the water, which may be let in to turn the wheel.

The nature of my invention consists in providing a cylindrical curb or case around a water-wheel, for its protection, having an inside flange at the top, and an outside flange at the bottom; and in arranging a cylinder within the wheel, with openings for admitting water to the wheel, the same having an outside flange by which it is supported, and a bottom to support the weight of the water above; also, in providing a cylinder, fitting in the one last mentioned, supported also by a flange at the top, and having openings for the water to pass through corresponding to those of the cylinder outside of it, but movable, so as to regulate the quantity of water admitted to the wheel; and in providing a spider-frame fastened to the outside curb or case for supporting the step of the wheel-shaft.

In the accompanying drawings—

Figure 1 is a perspective view of the cylindrical curb and its flanges, with such other parts as may be readily seen.

Figure 2 is a section of the wheel and its belongings, cut vertically through the centre.

Figure 3 is a section of the wheel, cylinder, and gate, below the line *z z* on fig. 2.

In these drawings—

D is a cylindrical curb, made larger than the wheel A, so as to permit the water issuing from the wheel to pass down freely between it and the curb.

I prefer to make this curb of cast-iron, with a flange, E, on the outside, at the top, to rest on the bottom of the flume, and support the curb when the wheel is set in its place for operation; also, with a flange, F, on the inside, to project over the top of the wheel, as shown in the drawing, to support the cylindrical case B, fitted to the inside of the flange F and wheel A, and supported by a flange on the outside, at the top, resting on the flange F.

The case B extends down through the wheel A, as shown in the drawing, and is provided with a bottom, G, to sustain the water above, so as to prevent it from pressing downward on the arms A<sup>3</sup> of the wheel, and increasing the friction in the step *a* of the shaft A<sup>1</sup>.

This shaft passes up through a hole in the bottom G, and is held above the wheel by the frame H, fastened to the flange F, as shown in the drawing.

The arms A<sup>3</sup> are fastened to the lower rim of the wheel A, and to the shaft A<sup>1</sup>, which is turned by the wheel, and may be provided with a pulley, or gear, or coupled to another shaft, to turn machinery.

The rims A A of the wheel are connected by the buckets A<sup>2</sup>, which may be made in the form shown in fig. 3, or in such other form as may be preferred.

The cylindric case B is provided with openings *c*, for the water to pass out against the buckets A<sup>2</sup>, to propel the wheel.

To close the openings *c c*, I make a second cylinder, C, to fit the inside of B, with openings corresponding to the openings *c c* in the case B, as shown in fig. 3, and provide it with a flange on the outside, at the top, to rest and turn upon the top of the case B, so that it may be moved to open or close the openings *c c*, and thus regulate the quantity of water admitted to the wheel.

To turn the cylinder C, I fit a shaft, C<sup>2</sup>, to turn in the frame H and flange F, with a pinion, C<sup>1</sup>, on it, to take into the teeth C<sup>3</sup> on the flange of the cylinder C, as shown in fig. 1.

The bridge-tree I is fastened to the curb D, to support the step *a* of the shaft A<sup>1</sup> of the wheel.

This wheel and all its appurtenances may be made at a foundry or machine-shop, and fitted together, and transported, without being separated, to the place where it is to be used.

The principal advantages of my wheel are—

First. The wheel itself is made very wide or of great diameter, in order to give great leverage to the water acting upon the buckets; and the buckets are made very shallow and with a small issue, so as to occupy only a narrow rim at the verge of the wheel; and the height or length of the buckets is very great in order to give them sufficient capacity for the necessary amount of water; the inner ends of the buckets are curved to fit the outer curve of the hollow cylinder B, while the whole face of the bucket is presented to the direct action of the water-shoot, and to the constant pressure of the copious volume of water, settling steadily down within the cylinder B, thus preventing agitation and broken currents and consequent loss of power.

Second. The hollow-slotted cylinder B is of such shape as to be easily cast and finished, and not liable to strain or crack in cooling, as would be the case if cast with a central small cylinder enclosing the shaft of the wheel; and this cylinder, being both broad and high,



brings a full volume of water, in a state of comparative rest, to occupy about fifteen-sixteenths ( $\frac{15}{16}$ ) of the entire diameter of the wheel; and from this cylinder the water has to flow only an inch to strike the full face of the buckets at the rim or extreme verge of the wheel; at the same time this cylinder relieves the wheel from the weight of the column of water.

Third. The cylinder or curb D not only protects the wheel from flood-wood, and acts as a suction-box, but it also supports the spider I and the wheel itself, so that the whole may be hoisted out of the water for repair, which is very important, especially in time of high water.

I do not claim a curb or suction-box around a water-wheel, or a revolving gate, but I believe the above-described construction and arrangement are new, and especially the hollow-slotted cylinder B with the shaft passing through a hole in the bottom of the cylinder, and through the water in which it revolves, so that

the whole space inside of the buckets is occupied by a broad column of water in a comparative state of rest.

Having thus fully described my invention,

What I claim, is—

1. The hollow cylinder B, and the gate C, in combination with the shaft and wheel, substantially as set forth.

2. A turbine-wheel, consisting of the wheel A, the registering interior and exterior cylinders B and C, with the register-operating mechanism  $c^1 c^2 c^3$ , the projecting cover F E, and the shaft A', stepped upon the spider I, all combined, arranged, and operating substantially as set forth.

In testimony that I claim the foregoing as my own, I affix my signature, in presence of two witnesses.

Witnesses:

B. I. TALBOTT.

F. A. GATES,

O. N. GARRISON.