

S. Martin,

Water Wheel.

No. 100648.

Patented Mar. 8. 1870.

fig. 1.

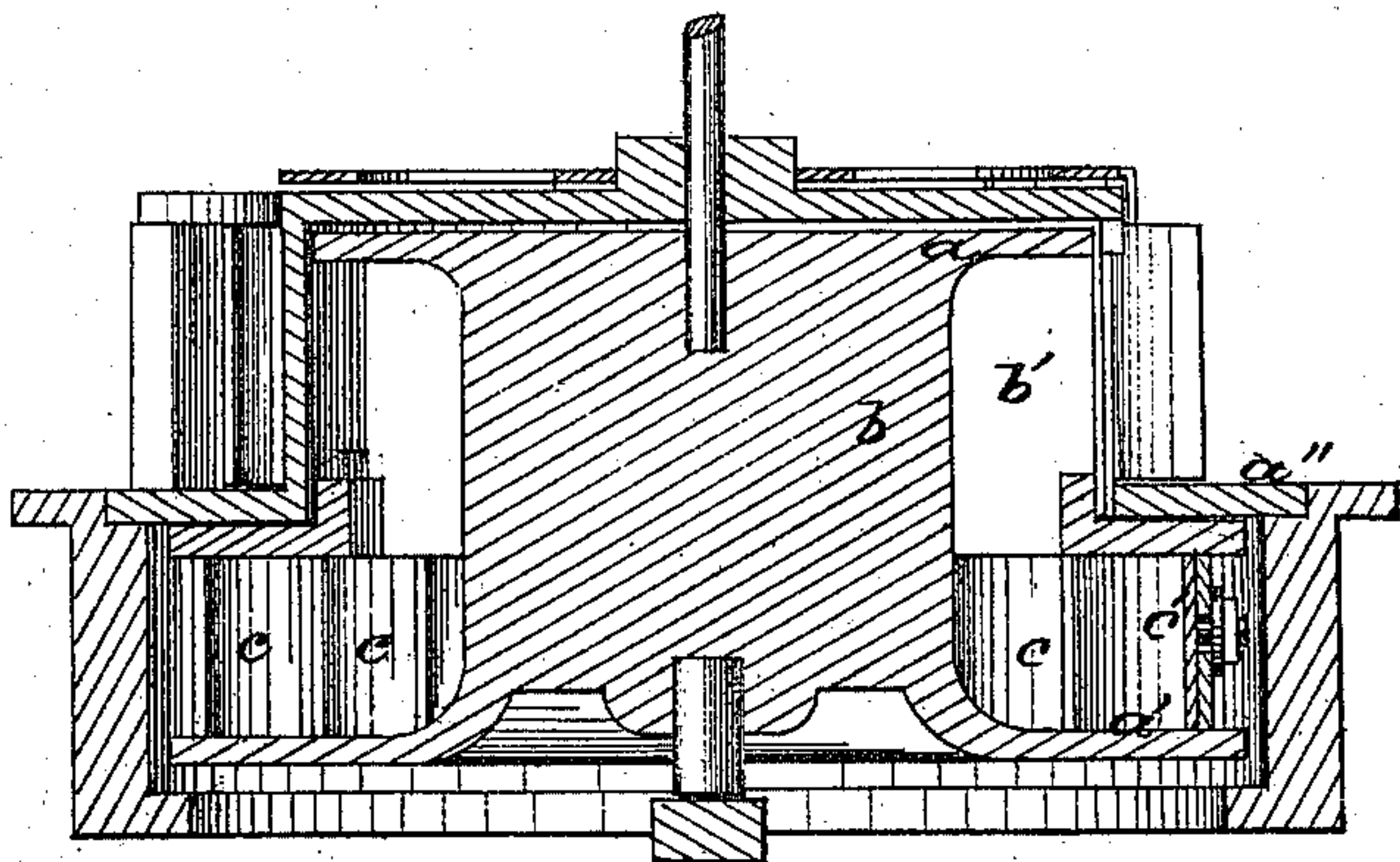
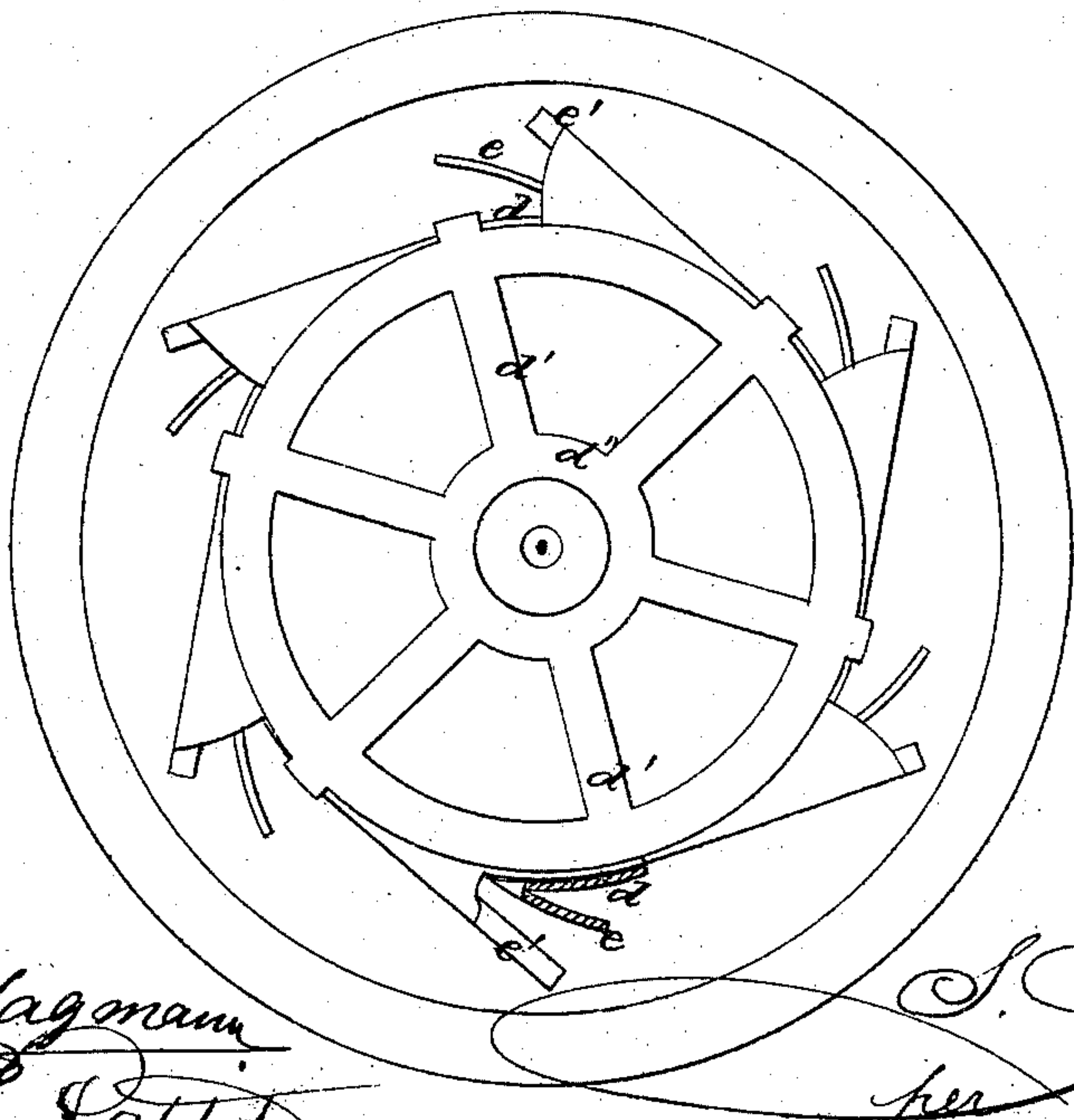


fig. 2.



Witnesses:

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United States Patent Office.

SAMUEL MARTIN, OF YORK, ASSIGNOR TO HIMSELF AND B. F. MANIFOLD,
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Letters Patent No. 100,648, dated March 8, 1870.

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, SAMUEL MARTIN, of the city and county of York, and State of Pennsylvania, have invented a new and improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a vertical central section through the wheel, and

Figure 2 is a plan view of the curb, gates, and curved plates.

This invention consists of certain improvements in turbine water-wheels, tending to increase their efficiency, as will hereinafter more fully appear.

In the drawings—

The wheel is shown to consist of an upper disk, *a*, a lower disk, *a'*, the lower being of somewhat greater diameter than the upper, an intermediate parallel ring, *a''*, of the same diameter as the lower disk, the upper and lower disks being connected by a web, *b*.

Projecting radially from the web *b* are vertical buckets *b'*, the upper ends of which are placed beneath the disk *a*, while their lower ends are even with the under side of the ring *a''*, which ring serves to support their lower parts between itself and the web *b*.

The ring rests on curved buckets *c*, which themselves rest on the lower disk.

The curved buckets extend inward to the inner side of the ring *a''*, and outward nearly to its outer side.

The water acts directly on the buckets *b'*, then falls upon the lower disk, and is, by the centrifugal action of the wheel, swept against the inner sides of the buckets *c*, and out of the wheel between the ends of said buckets. It thus imparts a reactionary force to the curved buckets in addition to its direct action upon the buckets *b'*.

To each curved bucket *c* there is secured, by a set-screw passing through a slot in the bucket, a plate, *e*, of the same shape and size, whose convexity fits accurately the concavity of the bucket, and which may be slid outward, according to the length of the slot in the bucket, and thus diminish the size of the open-

ings between the buckets, so as to prevent waste of water.

In fig. 2 are seen the gates *d*, each by itself, and attached to a radial arm, *d'*, projecting from a central hub, *d''*.

The gates are arranged in pairs, the two of each pair being exactly opposite each other, at different sides of the curb, and all the gates moving at the same time.

This arrangement places the gates in equilibrium as to the pressure of the water, rendering it easy to open or close them.

The end of each gate that enters the opening in the curb is provided with a curved vertical plate, *e*, set at an angle across such end and extending inward far enough to conduct the water past the wall of the curb.

Such plates form, with the plates *e'* of the curb, guideways that conduct the water to the wheel tangentially.

Having thus described my invention,

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

1. The combination of the vertical buckets *b'* with the curved buckets *c*, in the manner described and for the purpose of enabling the water both to act directly and to react upon the wheel.

2. In combination with the curved buckets *c*, the sliding adjustable plates *e'*, in the manner and for the purpose described.

3. The detached gates *d* when so combined with the revolving frame *d' d''* as to be all in equilibrio, in the manner and for the purpose set forth.

4. The gates *d* combined with the curved plates *e*, for the purpose of forming a perfect guideway, substantially as specified.

To the above specification of my invention I have signed my hand this 30th day of November, 1869.

S. MARTIN.

Witnesses:

CHAS. A. PETTIT,
SOLON C. KEMON.