

E. G. Cushing, Water Wheel.

N^o 16,432.

Patented Jan. 20, 1857.

Fig. 2.

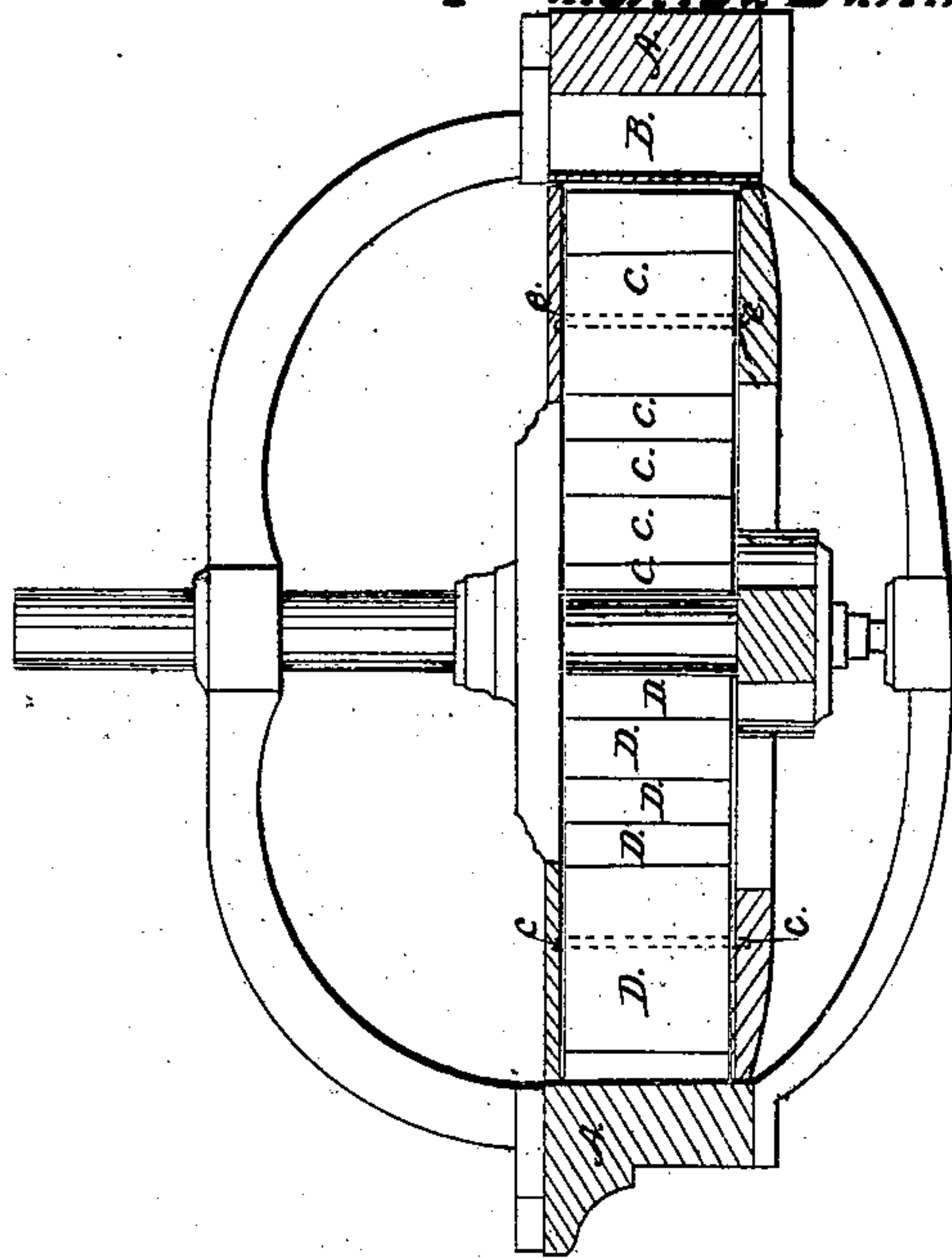
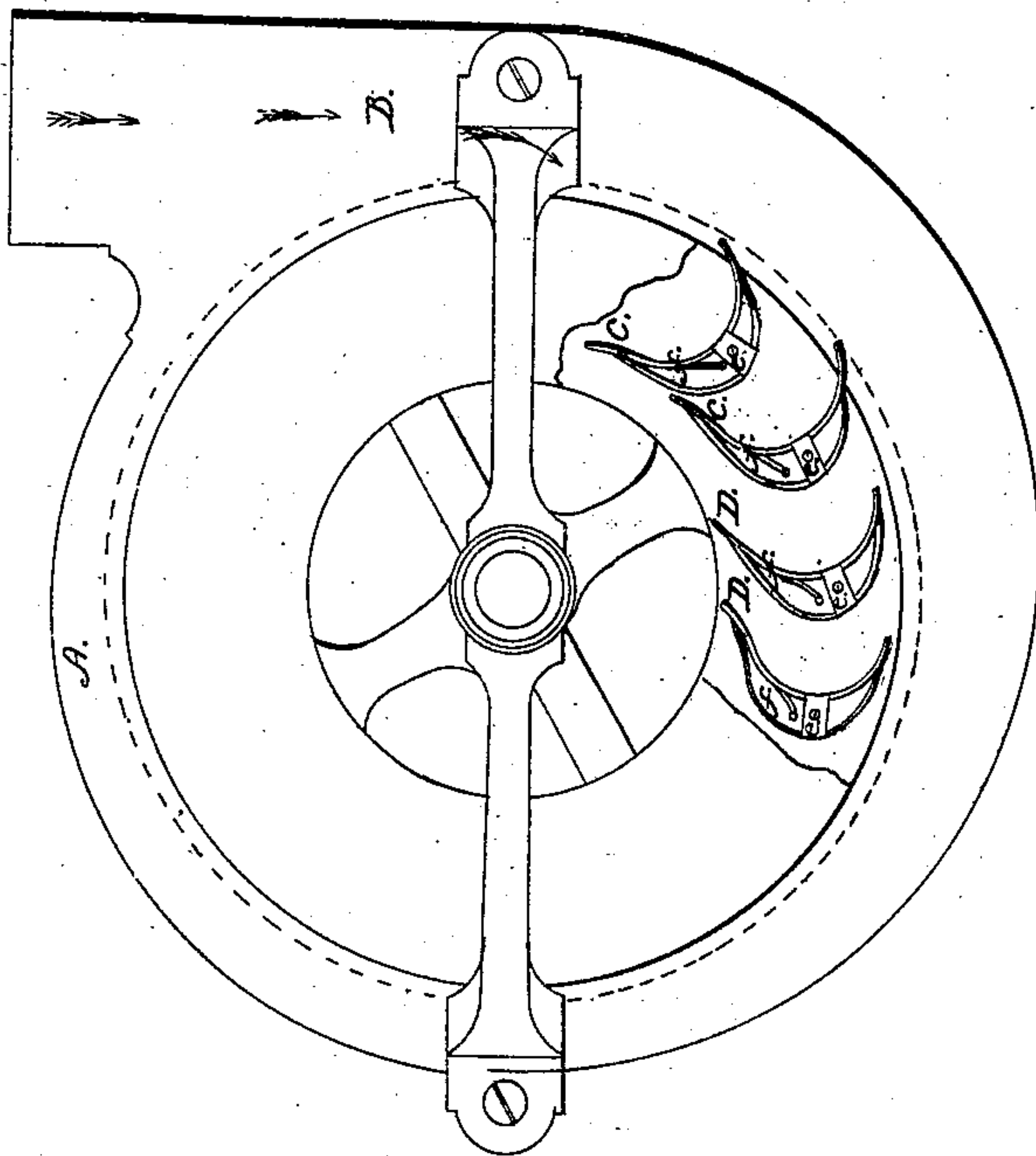


Fig. 1.



UNITED STATES PATENT OFFICE.

E. G. CUSHING, OF DRYDEN, NEW YORK.

IMPROVED CENTER-VENT WATER-WHEEL.

Specification forming part of Letters Patent No. 16,432, dated January 20, 1857.

To all whom it may concern:

Be it known that I, E. G. CUSHING, of Dryden, in the county of Tompkins and State of New York, have invented certain new and useful Improvements in Center-Vent Water-Wheels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in so arranging and hanging the buckets of the wheel as to enable me to obtain the same per cent. of power from a small as from a large quantity of water. The more power required of the wheel the more water it will discharge. Consequently there can be no waste of water, for there is just enough used to perform the labor required. This object is attained by the use of a self-adjusting bucket constructed and arranged as will be hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

Figure 1 is a plan view with the top detached, showing the arrangement of the buckets, springs, &c. Fig. 2 is a section taken through line *x x*.

Similar characters refer to like parts in the several figures.

A denotes the scroll or chamber in which the wheel is placed.

B is the chute through which the water passes to the wheel.

C and D are the buckets. Those marked C are in the position they assume when but a small jet of water is admitted to the wheel. Those marked D are in the position they assume when acting under the pressure of a large jet of water. It may be seen that the buckets are constructed of two parts having different curves with a hollow space between them, or they may be cast of any suitable metal in the form shown in Fig. 1.

e are pivots on which the buckets turn, said pivots being positioned at such a point as to throw the leverage of the bucket in favor of the inside of the wheel, thus causing the water to be discharged accordingly.

f are springs placed between the two sections of the buckets, as seen in Fig. 1. Said spring possesses sufficient strength to prevent the discharge of the water until its power is exhausted and yields to the pres-

sure of water in proportion to the amount of power exerted. Thus we see that the buckets are perfectly self-adjusting.

By examining Fig. 1 it may be seen that the space between the buckets is made of a continuous taper from the entrance to the discharge, thereby preventing the water from slacking or becoming dead after first entering the wheel, and also keeping it free from air or breaking up before the wheel starts. Another important feature in the economy of the wheel is that it may be bolted together through the interstices in the buckets, thereby obviating the difficulty of having the water come in contact with the bolts, &c., which break it up and also divert it from its most efficient course. This arrangement also renders the back of the bucket more oblique, so that the water in its escape will not react upon it with so much force as it would otherwise do.

Spring *f* closes the bucket when the gate is shut, thereby making a tight wheel, so that when the water is let in it immediately acts upon the wheel without frothing and foaming through the openings until the scroll and wheel are entirely filled with water.

There is one peculiar advantage which this bucket has over all others, as it can be used in time of low water or in driving a small amount of machinery by using any amount of gatage, which other center-vent wheels will not accomplish, as they do not have sufficient water in such cases to fill the issues when the water escapes with great loss.

Having thus fully described the construction and operation of my invention, I do not claim any particular-shaped bucket, as I am of the opinion that one stated curve is not adapted to all heads with equal results; but

What I claim is—

1. Making the bucket with a back of such a curve that it forms a space of regular contraction from the outside to the inside of the wheel.

2. Having the buckets combined with a spring in such a manner that the discharge-orifice is regulated by the quantity of water let into the scroll and the amount of power required and closing together when the gate is shut.

E. G. CUSHING.

Witnesses:

A. F. TANNER,
I. P. FERGUSON.