# W. March,

## Water Wheel,

No. 4,629. Patented July 14, 1846.

Fig. 5.

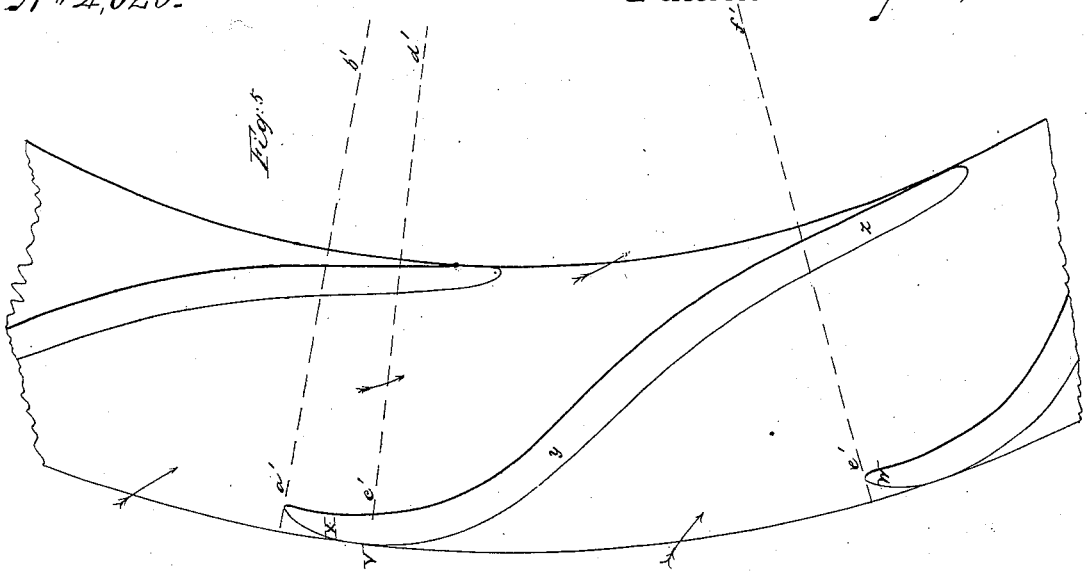



Fig. 2.

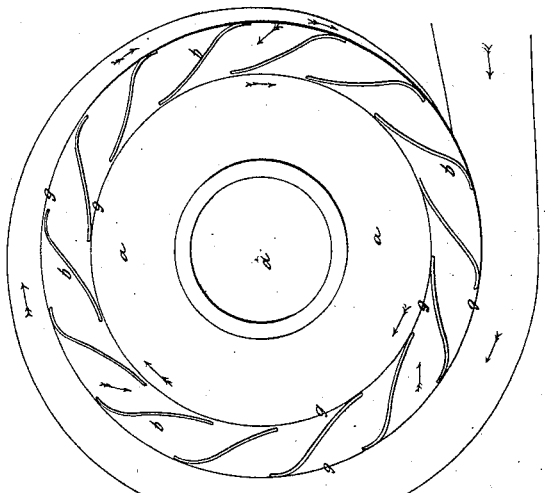



Fig. 1.

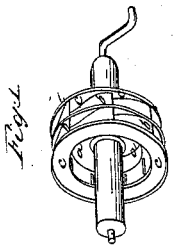



Fig. 3.

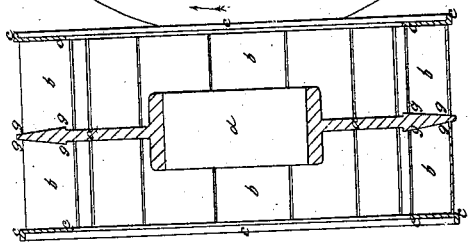
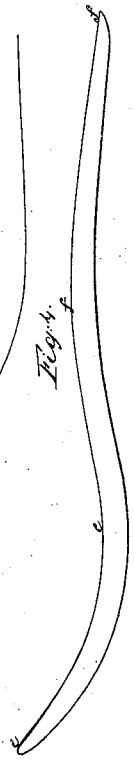



Fig. 4.



# UNITED STATES PATENT OFFICE.

WILLIAM MARCH, OF SANDBANK, NEW YORK.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **4,629**, dated July 14, 1846.

*To all whom it may concern:*

Be it known that I, WILLIAM MARCH, of Sandbank, in the county of Oswego and State of New York, have invented a new and Improved Double Center-Vent Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents one of my wheels mounted upon a horizontal shaft; Fig. 2, a section through one set of buckets (both sets being similar) at right angles to the shaft; Fig. 3, a section of the wheel parallel to the shaft, and Fig. 4 an edge view of a bucket for a three-foot wheel at full size. Fig. 5 represents a bucket in position with a portion of the supporting-ring and of the two adjacent buckets.

The same letters refer to the same parts in all the figures.

The nature of my invention consists in the peculiar form or curve which I give my buckets, these latter being arranged upon each side of a central disk, through the center of which the shaft passes, thus forming a double wheel, and not only allowing the spent water to escape more freely from the wheel by dividing it into two bodies, but also destroying the heavy lateral pressure experienced in single center vent-wheels.

*a a* is a center disk or flange of cast-iron, to each face of which toward its circumference the buckets *b b*, &c., are attached. It has an eye *d*, through which the shaft passes.

*c c c c*, &c., Fig. 3, are two rings, also of cast-iron, which serve to connect and support the outer ends of the buckets. My buckets may be considered to be divided into three sections (marked *x y z*) and determined by the lines *a' b' c' d'* and *e' f'*, (see Fig. 5,) drawn from the center to the circumference of the wheel. The line *c' d'* strikes the point *v* where the curve of the lip of the bucket is tangential to the periphery of the ring of the wheel. The section *x* comprehends about one-eighth of the whole length of the bucket, and is curved inward, or toward the center of the wheel, causing it to cut the current of water entering the apertures of the wheel when in motion more nearly at right angles than in the ordinary construction, and of course to encounter less resistance. The section *y* is nearly an ogee drawn very flat. This, from the position of the bucket in the wheel, as shown in Fig. 5, affords an extended surface for the direct pressure of the water or for a larger body to lie upon the wheel, and thus gives a greater "starting-power," and consequently a greater propelling-power. The portion *z*, cut off by the line *e' f'*, drawn from the center of the wheel to the point of the adjacent bucket *w*, is nearly straight, and is tangential to the inner circumference of the ring of the wheel, thus affording a smooth and direct passage to the spent water through the apertures into the wheel and obviating the "pawing back" or loss of power arising from the action of the inner end of the bucket as usually constructed.

Figs. 4 and 5 being the full size for a three-foot wheel will of course suffice to enable any skillful millwright to execute my improvement upon any given scale by preserving the proportions of the several parts.

It will be observed that the portion *g g* of the center disk *a a*, Fig. 2, which adjoins the inner ends of the buckets, increases in thickness from the circumference of the wheel inward, or toward the center.

It may be here remarked that the water which discharges internally through the buckets of a center-vent wheel has necessarily a motion contrary to that of the wheel, as shown by the arrows in Fig. 2.

The object of forming the outer portion of the disk *a a* with the inclined surfaces *g g g g*, &c., is to give the water passing between the buckets into the wheel a direction away from its center, thus preventing any action against the inner portions of the disk, whereby the motion of the wheel would be retarded.

It is evident from the construction of this wheel that the lateral pressures upon each side of the disk *a a* will counterbalance each other and prevent any tendency in the wheel to press toward either gudgeon. The water, too, as before mentioned, is discharged more readily from the wheel from its being divided into two bodies by the center disk and thrown from both sides of the wheel. The water is laid on by means of a scroll, as usual. (Indicated in Fig. 2 by the red lines.)

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

The peculiar form or curve which I give to my buckets, as herein described and represented, the outer end or lip thereof being curved inward, or toward the center of the wheel, the middle portion having the form of a very flat ogee and the inner end being straight and tangential to the inner circumference of the ring of the wheel.

WILLIAM MARCH.

Witnesses:
J. T. GIBSON,
AARON FULLER.