2 Sheets--Sheet 1.

J. TYLER.

Water-Wheels.

No. 147,351. Patented Feb. 10, 1874.

FIG. 1.

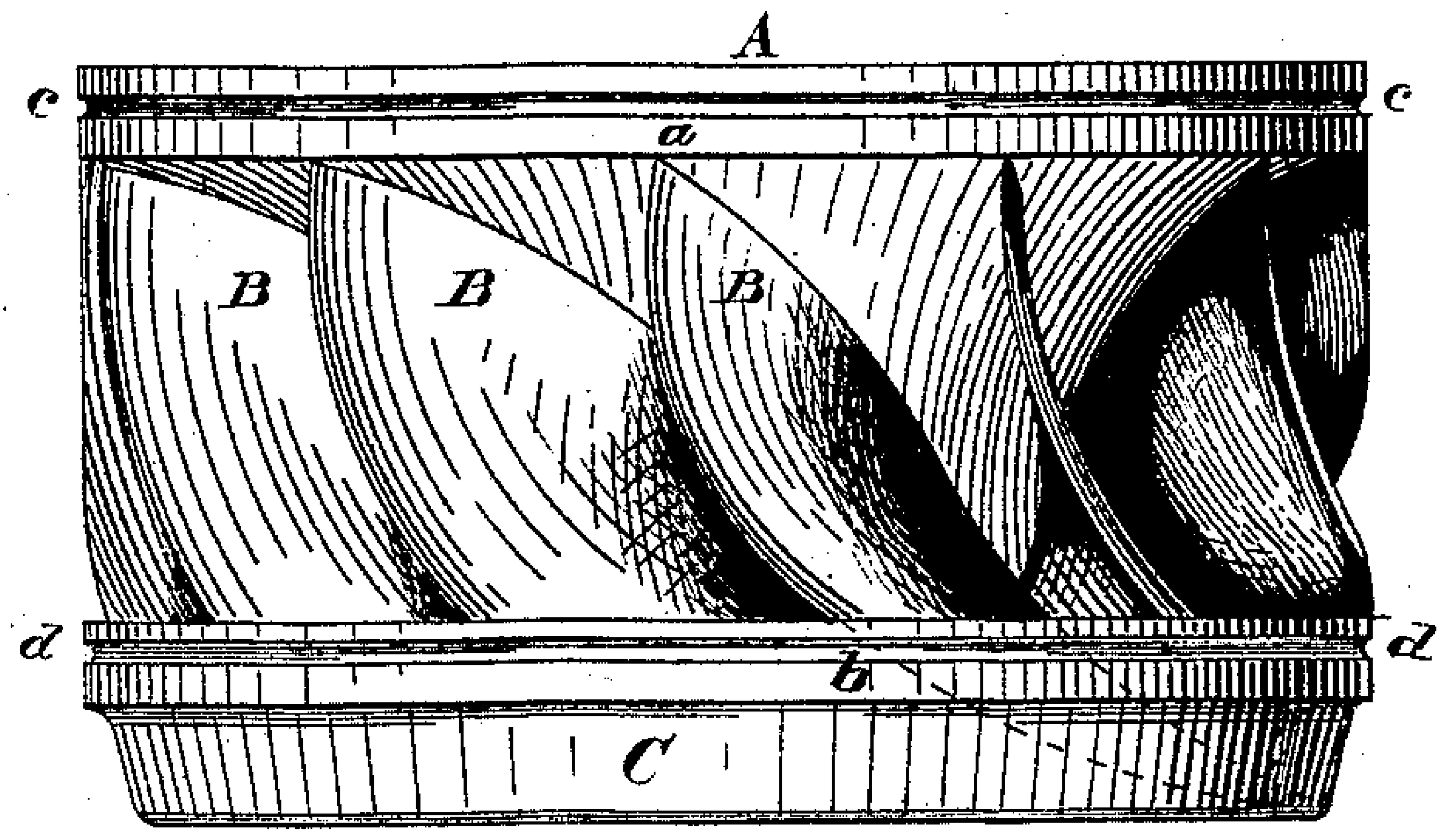


FIG. 2.

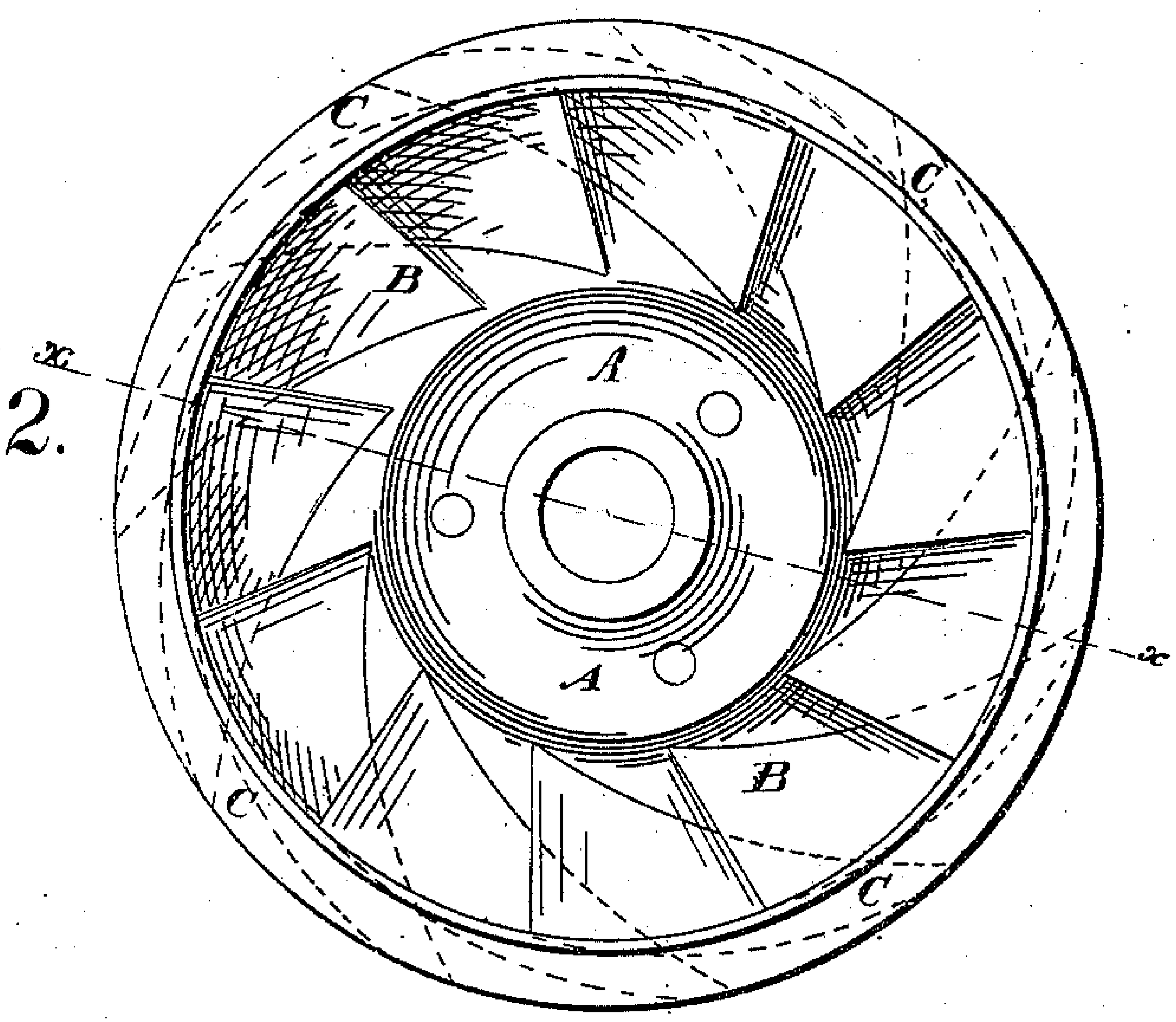
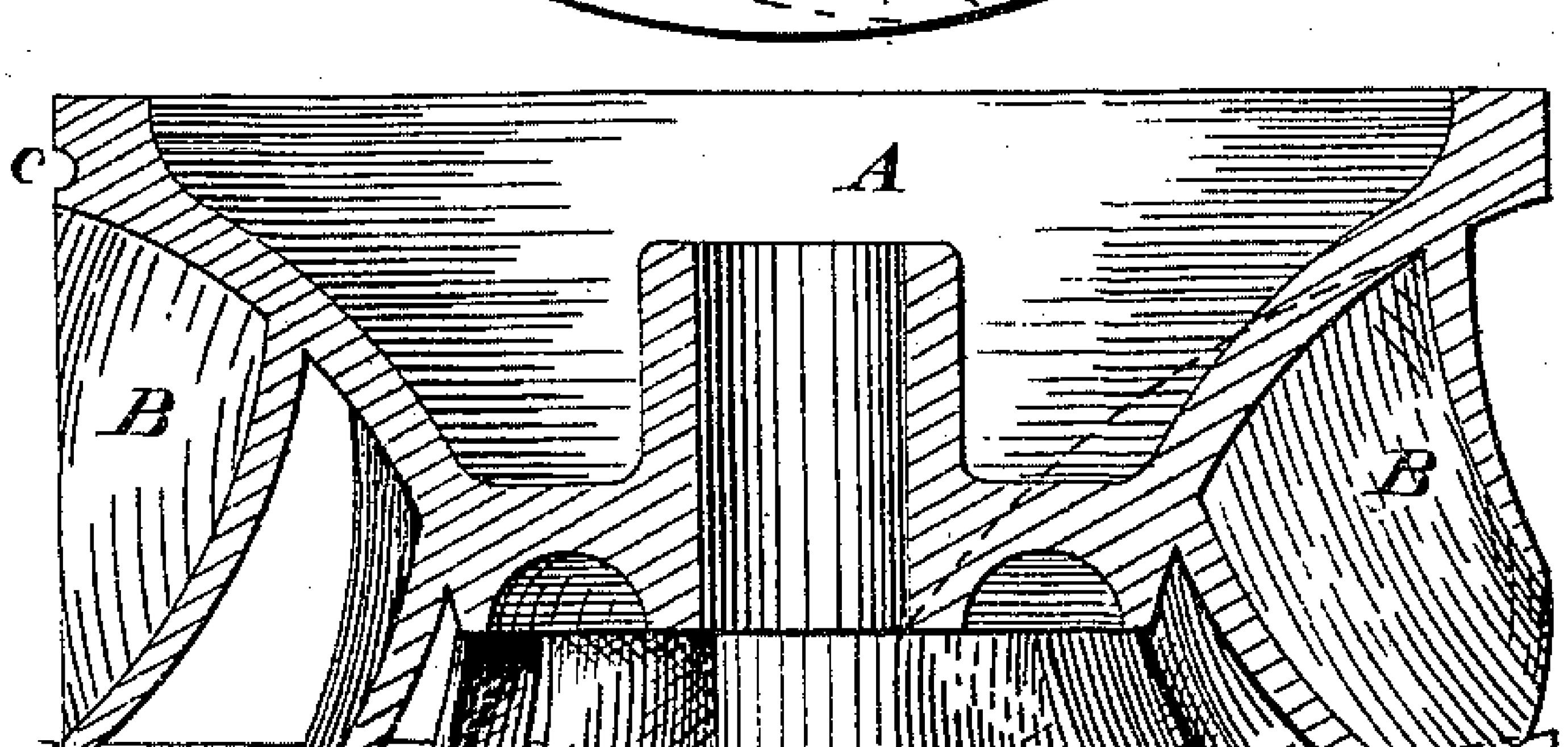


FIG. 3.



Witnesses.
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atty

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS)

2 Sheets--Sheet 2.

J. TYLER.
Water-Wheels.

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FIG. 4.

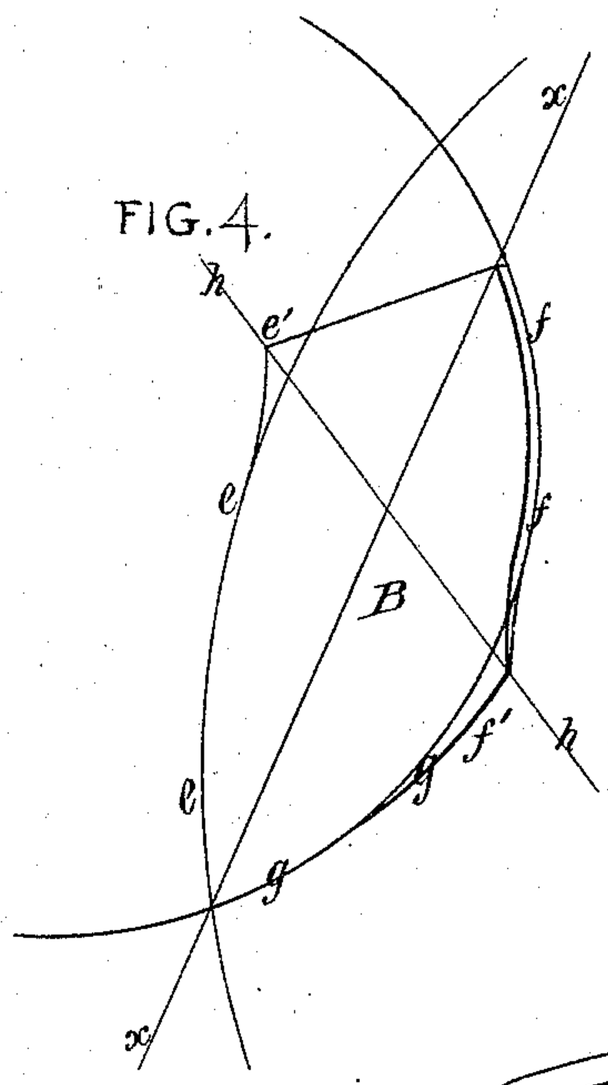


FIG. 5.

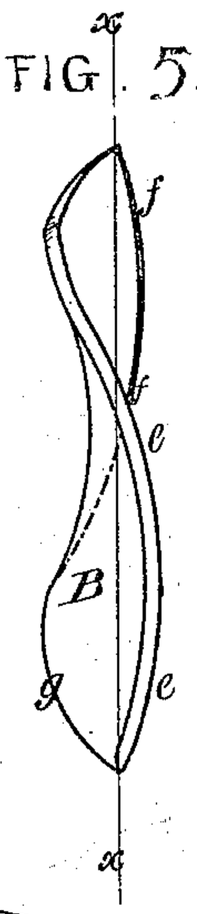
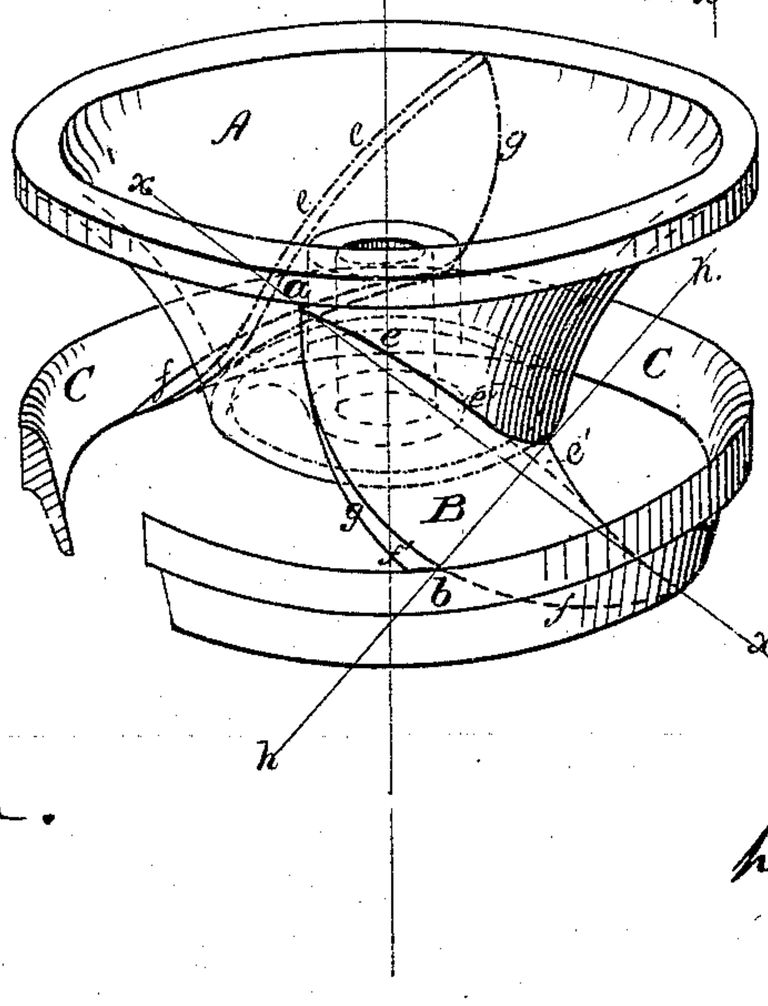


FIG. 6.



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UNITED STATES PATENT OFFICE.

JOHN TYLER, OF CLAREMONT, NEW HAMPSHIRE.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **147,351,** dated February 10, 1874; application filed December 27, 1873.

To all whom it may concern:

Be it known that I, JOHN TYLER, of Claremont, in the county of Sullivan and State of New Hampshire, have invented a new and Improved Water-Wheel, of which the following is a specification:

My invention relates to turbine water-wheels, and is an improvement on the buckets shown in the Letters Patent granted to me July 8, 1856, extended and reissued, and the Letters Patent dated August 20, 1872; and the invention consists in a novel construction and arrangement of buckets combined with a central bucket-head, and has for its object to improve the efficiency and increase the power of the wheel, as will be fully set forth hereafter.

Figure 1 is a side elevation; Fig. 2, a plan view of the bottom of the wheel. Fig. 3 is a vertical transverse section through *x x*, Fig. 2. Figs. 4 and 5 are side and edge views of the bucket; and Fig. 6 is a perspective view, showing the position of the buckets between the head and rim of the wheel.

A A represent the bucket-head, which is curved, as shown in Fig. 3, being similar in shape to a frustum of an inverted bell. This head has been the subject of Letters Patent granted to me, and is fully illustrated and described in my before-mentioned patents. A particular description of it will, therefore, be unnecessary. B represents the buckets, and C a ring or band encircling their lower extremities. These buckets are peculiarly formed. By referring to Figs. 4, 5, and 6, it will be observed that they are twisted, the axis *x x* of the twist passing through the opposite angles of the bucket. It will also be seen that the lines bounding the edges *e f* of the buckets are arcs of circles. The outer edge *g* is a continuation of the edge *f*, which joins the ring C, the slight deviation *f'* being for the purpose of lapping the edge over the round upper edge of the ring C, as shown in Fig. 6. It will be observed that, aside from this deviation, the outer edge *f*, which joins the ring C, is an arc of a circle. The inner edge *e*, joining the head A, is also the arc of a circle, the slight deviation *e'* being for the accommodation of the bucket, which turns slightly around the head at this point.

The water, on entering the wheel, strikes a full curved surface, formed by the curved section of the bucket on the line *h h*, from the point of the junction of the outer edge of the bucket with the upper edge of the ring C to the lower point of the upper edge of the bucket.

In the pattern of the wheel, the buckets are made detachable from the head and rim, and, the wheel being cast in a three-part flask, the ring is molded in the bottom part, the head in the top, and the buckets in the middle section, of the flask. The head is then taken off and the buckets drawn out. This could not be accomplished with any other curved bucket, unless the curves were all arcs of circles running in the same direction.

In the buckets of my wheel there are no abrupt curves or irregular surfaces to suddenly change the direction of the water; but the bucket is a portion of a twist, as before mentioned, and its edges, which join the head and ring, are bounded by arcs of true circles. The buckets are inclined tangentially to the head A to create reaction, and also to the axis of the wheel, for the purpose of bringing the weight of the head of water to bear on the buckets, and thus act by impingement as well as reaction, as shown in Figs. 1 and 6, where the bucket's outer edge *g* is seen commencing at the point *a* on the rim of the head, and joining the ring C at the point *b*, thus making an angle with the axis of the wheel.

This principle of constructing buckets is a great improvement upon the old ones, as is demonstrated by scientific and practical tests, in which a wheel constructed in accordance with the present invention gives seven (7) per cent. more power than any wheel heretofore made by me, all the different wheels being run in the same curb with the same head of water.

I claim—

1. In combination with the curved head A and rim C, the twisted buckets B, the edges *e f* of which, joining the head A and rim C, are bounded by arcs of circles, constructed and operating substantially as described and specified.

2. The combination, with a water-wheel, of the twisted buckets B, constructed and operating substantially as described and specified.

JOHN TYLER.

Witnesses:
A. T. BATCHELDER,
WM. BALLOCH.