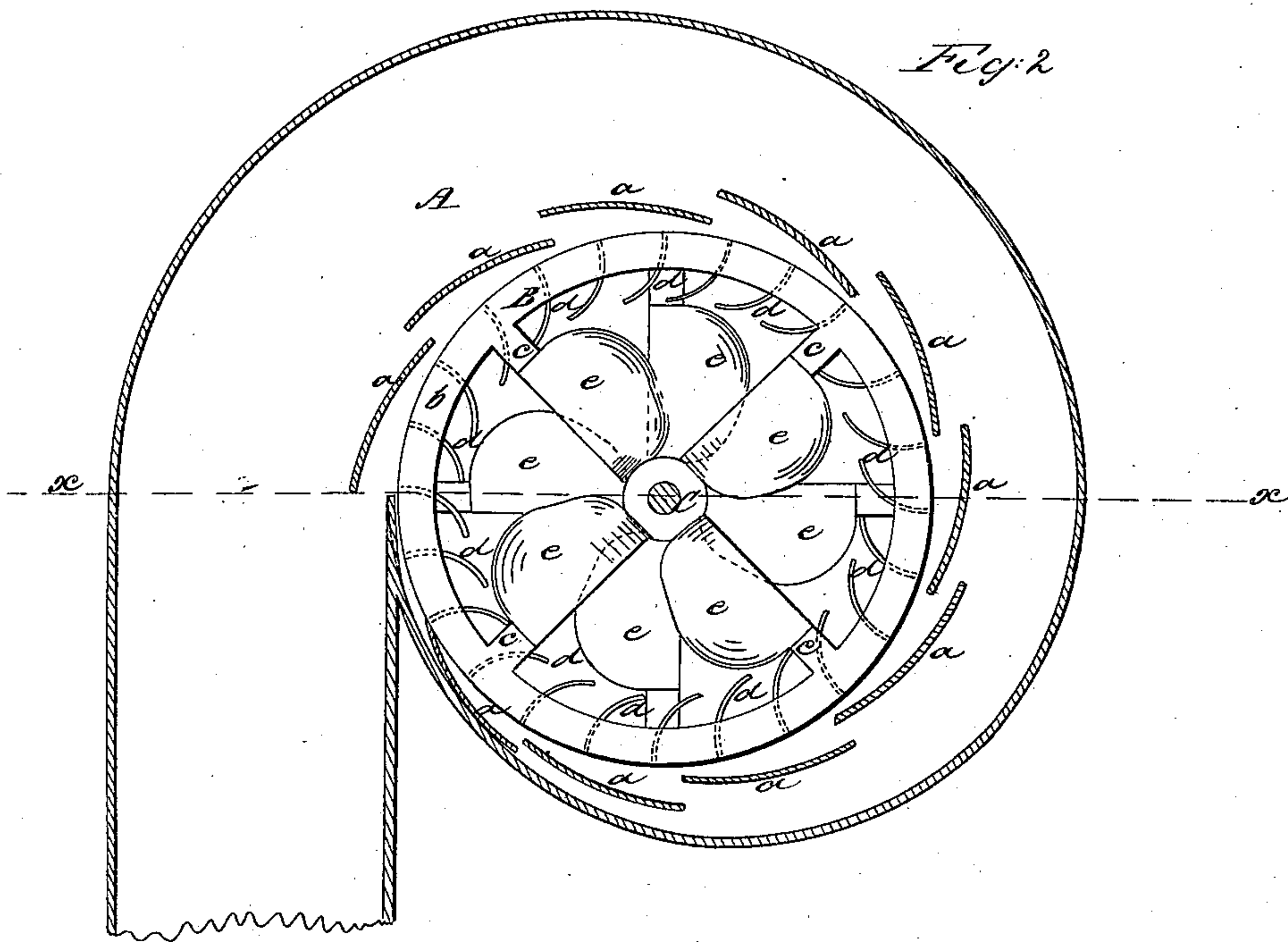
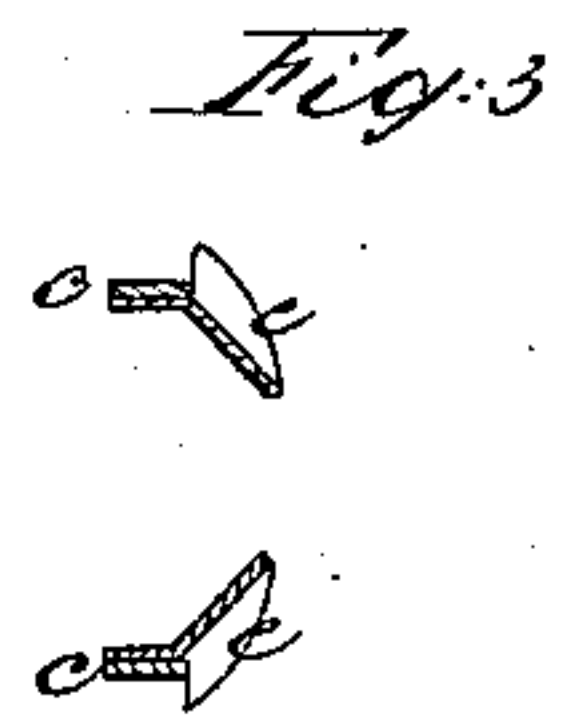
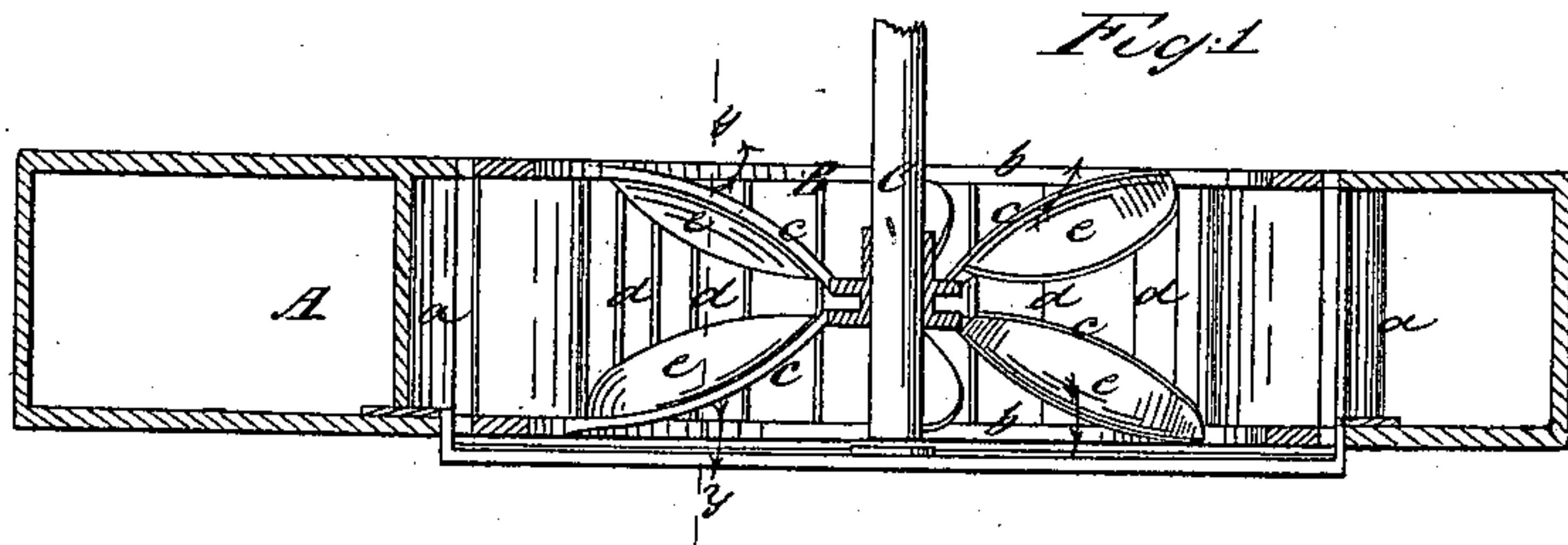


# A. Munroe, Water Wheel.

N<sup>o</sup> 15,384.

Patented July 22, 1856



# UNITED STATES PATENT OFFICE.

A. MUNROE, OF WORCESTER, MASSACHUSETTS.

## IMPROVED REACTING WATER-WHEEL.

Specification forming part of Letters Patent No. 15,384, dated July 22, 1856.

*To all whom it may concern:*

Be it known that I, A. MUNROE, of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and Improved Horizontal 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 annexed drawings, making a part of this specification, in which—

Figure 1 is a vertical section of my improvement, *x x*, Fig. 2, showing the plane of section. Fig. 2 is a plan or top view of same, the top plate of the scroll being removed. Fig. 3 is a detached vertical section of the inclined plates which are attached to the arms of the wheel *y y*, Fig. 1, showing the plane of section.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in placing the wheel within a spiral sluice or scroll having deflecting or guide plates attached to it for the purpose of causing the water to act in the proper direction against the buckets, and having concave buckets attached to the wheels and inclined plates attached to its arms, as will be presently shown and described, whereby the greatest effective force of the water is obtained and the water discharged from the center of the wheel, so as to allow a free and unobstructed current to pass through the spiral or scroll.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a scroll or spiral sluice which is connected with the flume or penstock of a mill-pond or reservoir of water by which the wheel is driven.

B represents the wheel, which is fitted within the scroll A, as shown in Fig. 2. The inner side of the scroll is not formed of a solid plate, but of plates *a*, which are placed in oblique positions similar to slats of blinds, so that the water can pass between the slats or plates *a* and act upon or against the buckets of the wheel.

The wheel B is formed of two rims *b b*, placed one above the other and connected to the shaft C by arms *c*, said arms being attached to the shaft C at a point intermediate

between the two rims *b b*. The arms therefore are curved, as shown clearly in Fig. 1.

The buckets *d* of the wheel are of concave form, as shown in Fig. 2, and are placed vertically and tangentially between the rims *b b*, so that their inner ends will be nearer together than their outer ends. (See Fig. 2.)

To the arms *c* of the wheel B there are attached plates *e*, the front edges of which are rounded. These plates of course are curved or bent, corresponding with the curvature of the arms, and the front parts of the upper plates *e* are bent downward and the front parts of the lower plates *e* are bent upward, as shown in Fig. 3.

The plates *a* are so placed relatively with the buckets *d* that they will cause the water to act against the outer edges of the buckets at right angles with them. The water passes from the buckets into the center of the wheel and is split or divided into two parts or columns by the plates *e*, which as they rotate force one part or column out over the top of the wheel and scroll and the other part below or underneath the scroll and wheel, as shown by the arrows in Fig. 1.

The above improvement is intended for a submerged wheel, and the plates *e* cause the water to pass through the scroll and act upon the wheel in an unbroken current as the plates assist the discharge of the water from the center of the wheel.

The above wheel has been practically tested and operates well when placed at a considerable depth below the surface of the water.

I do not claim the scroll A nor the concave buckets *d* when separately considered, for they have been previously used; but

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

The scroll A, having the guide or deflecting plates *a* attached to it, the wheel B, provided with the concave buckets *d*, and the plates *e*, attached to its arms *c*, the above parts being arranged and combined, as shown, for the purpose specified.

A. MUNROE.

Witnesses:

WM. HENRY HOWE,  
WM. GROUT.