C. Boyd,

Water Wheel.

No. 101,221. Patented Mar. 29. 1870.

Fig. 2

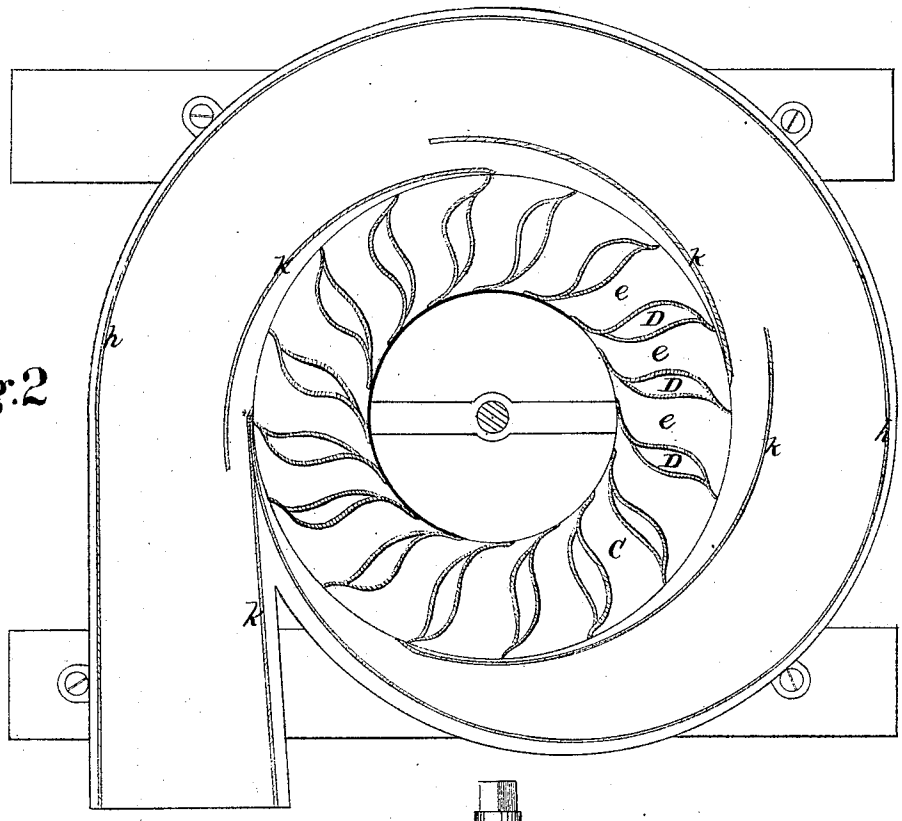
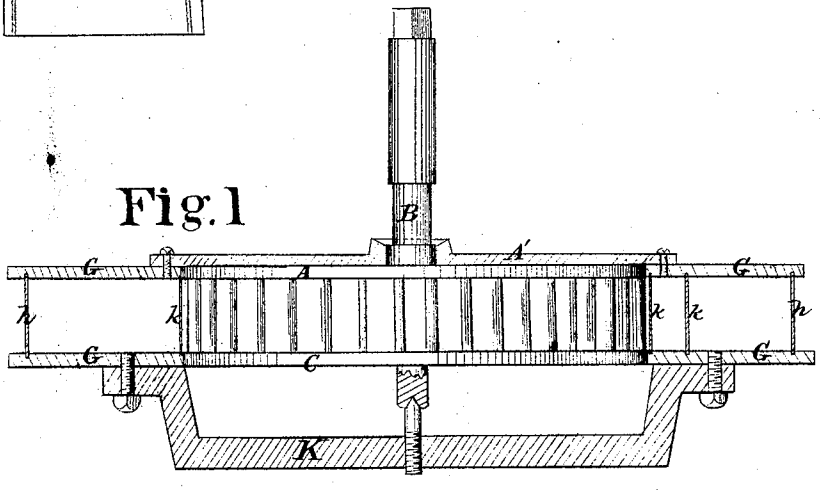


Fig. 1



Witnesses
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CLARK BOYD, OF ANDOVER, NEW YORK.

Letters Patent No. 101,221, *dated March* 29, 1870.

IMPROVEMENT IN TURBINE 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, CLARK BOYD, of Andover, in the county of Allegany and State of New York, have invented a new and valuable Improvement in Turbines; 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 annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a horizontal section of my invention.

Figure 2 is a vertical section of the same.

My invention relates to turbines, and consists mainly in the construction of the wheel and the scroll or conduit surrounding it without screws or bolts, and in the formation of the buckets, whereby advantage is taken of the reaction of the water as well as the impact thereof.

The letter A of the drawings designates the upper crown of the wheel, to which is secured the vertical shaft B.

A′ is the covering plate.

C represents the lower annular plate of the wheel,

D D are the buckets and *e e* the tapering serpentine conduits between them. The buckets are made hollow to secure lightness and at the same time the advantage of their form, thick in the middle and tapering toward both ends. They are secured in position by being cast in the metal of the upper and lower plates. Sheet metal or thin plates can thus be used for the buckets with advantage.

G G represent the upper and lower plates of the case. The outer wall thereof is marked *h*, and is secured to the upper and lower plates in the same manner that the buckets are fastened to the crowns, that is, in the casting. Thus, also, are fastened the inner sectional walls or curved plates *k k*, which guide the water against the buckets at the several points, and at the same time, by gradually contracting their distance from the buckets, force the water through the conduits *e e*.

K designates a brace secured to the under plate of the casing, having a pivot upon which turns the lower end of the vertical shaft B.

The impact of the water is upon the outer edge of the bucket. On account of the tapering form of the conduits, their charge of water is forced backward with rapidity through the exits thereof, and directed to the rear in such a manner as to obtain advantage of the reaction.

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

The turbine herein described, having tapering conduits *e e* and hollow buckets D D, leaf-shaped in their horizontal section, and secured in position by being cast in the metal of the crowns, as specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

CLARK BOYD.

Witnesses:

CHAS. C. MARTINDALE,

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