D. HUBBARD.
Turbine-Wheel.

No. 220,840. Patented Oct. 21, 1879.

Fig. 1.

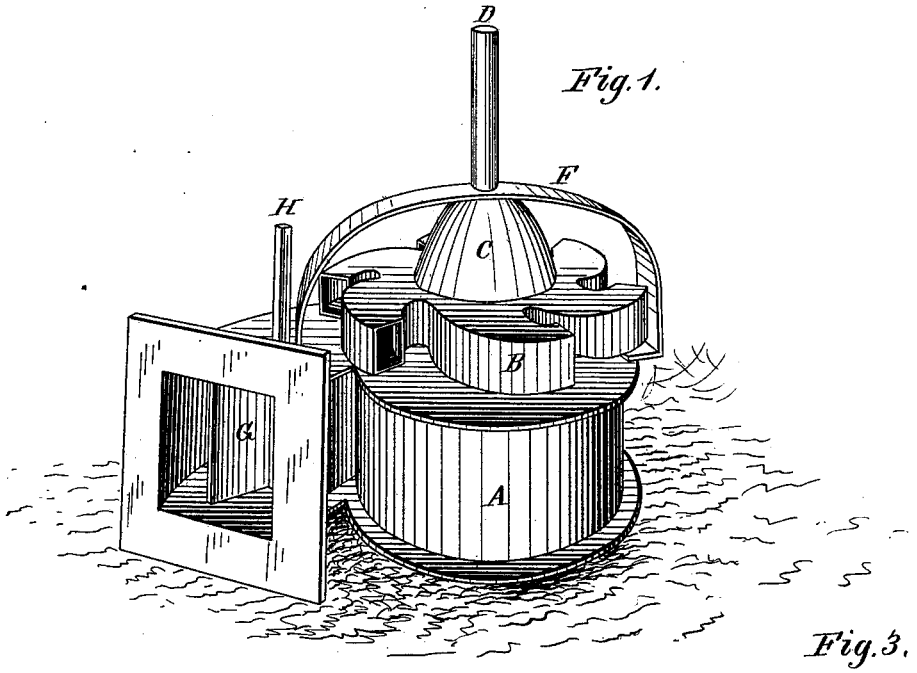


Fig. 2.

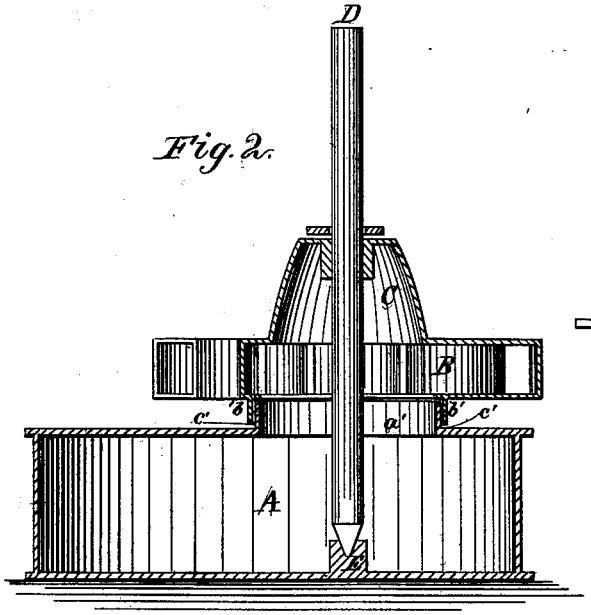


Fig. 3.

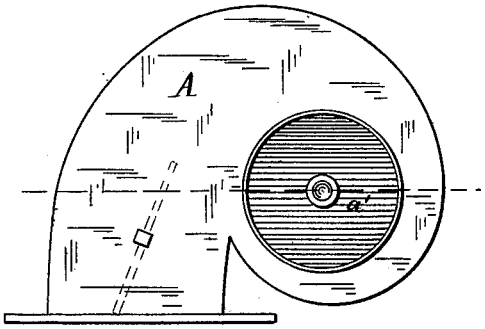
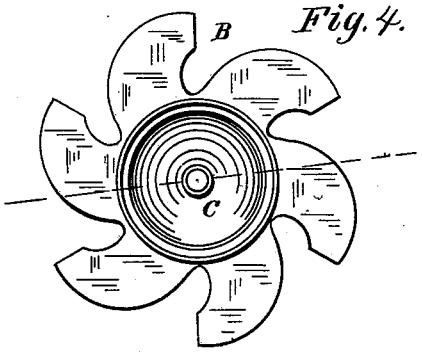


Fig. 4.



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UNITED STATES PATENT OFFICE.

DANIEL HUBBARD, OF OSWEGO, NEW YORK.

IMPROVEMENT IN TURBINE WHEELS.

Specification forming part of Letters Patent No. **220,840**, dated October 21, 1879; application filed March 5, 1879.

To all whom it may concern:

Be it known that I, DANIEL HUBBARD, of Oswego, in the county of Oswego and State of New York, have invented a new and Improved Turbine Wheel, of which the following is a specification.

Figure 1 is a perspective view of the wheel. Fig. 2 is a sectional elevation of the wheel. Fig. 3 is a plan of the scroll-flume. Fig. 4 is a plan of the inner face of the top of the wheel and air-chamber.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a turbine wheel that shall economize water-power in a greater degree than any other turbine wheel now in use.

The invention consists of a reaction-wheel that has an air-chamber in its upper section and is mounted on a scroll-flume that has a central aperture corresponding with the aperture in the lower section of the wheel. The water to operate the wheel enters the flume, and is made to assume a vortical or cyclonic motion before it reaches the wheel, so that the wheel does not have to expend power, as is ordinarily the case in changing a direct motion of the water-column to a rotary or spiral one; but it gains in power from the application of the cyclonic motion that the water has gained in passing through the flume.

Because of the peculiar construction of this wheel and the principles that govern its action I call it the "cyclonic turbine." The wheel can be made right or left handed, constructed so as to run to the right or left. It has a vertical axis, an outward flow, and receives the water at its center.

In the drawings, A is the scroll-flume, with aperture *a'*, over which the wheel B is fitted and held by the collar *b'*, projecting downward from the wheel, and encircling the flange *c'*, projecting upward from the flume.

In the upper part of the wheel is a hemispherical air-chamber, C, that furnishes an elastic cushion for the entering column of water to impinge upon, and thus reduces to a minimum its friction and loss of motion.

The shaft D of the wheel is vertical, and pivots in bearing E within the scroll-flume. The wheel is held upon the flume by the yoke F, as shown. The gate G at the mouth of the flume is secured to rod H, and can be adjusted to regulate the inflow or supply of water to the wheel. Owing to the shape of the flume the water that enters it under a head quickly assumes a vortical or spiral motion that becomes intensified at the aperture connecting the flume with the wheel, and consequently it enters the wheel and presses upon its inner periphery with the pressure not only of the head, but also with that due to the acquired centrifugal motion.

By thus making the column of entering water move in the same plane of direction as the wheel, before it affects or is affected by the wheel, a very considerable increase of power is gained over those wheels to which the water is differently presented.

By experience I have found that this wheel will revolve more than twice as fast as any other turbine wheel under the same head and volume of water.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A reaction turbine wheel in which the wheel is surmounted by an air-chamber and is set on the outside of a scroll-shaped flume that has a central aperture, through which the water is delivered into a corresponding central aperture in the wheel.

2. The within-described turbine wheel, consisting of flume A, wheel B, with air-chamber C, shaft D, shaft-bearing E, yoke F, and gate G, substantially as herein shown and described.

DANIEL HUBBARD.

Witnesses:
HENRY D. BAKER,
P. FONDA.