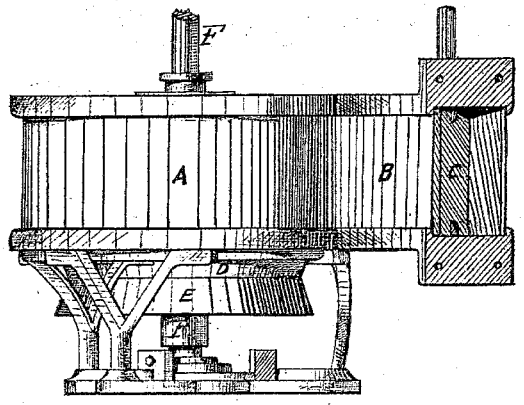
ASHLEY D. COLE.

Improvement in Water-Wheels.

No. 115,578. Patented June 6, 1871.

Fig. 1. Elevation.



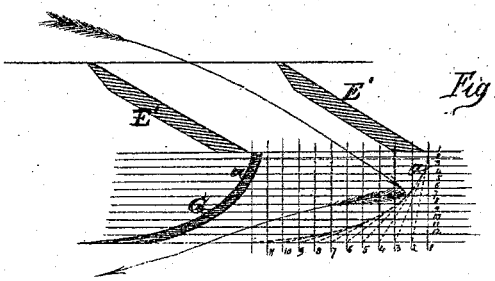




Fig 2. Section shewing method of constructing buckets & shoots.

Inventor.

Ashley Dodge Cole

by Messrs. Ridout & Howard.

his attorneys in fact

Witnesses.

Claud. T. Cayley.

John Smith

# UNITED STATES PATENT OFFICE.

ASHLY DODGE COLE, OF TORONTO, CANADA.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 115,578, dated June 6, 1871.

I, ASHLY DODGE COLE, of the city of Toronto, in the county of York, Province of Ontario and Dominion of Canada, machinist, have invented certain Improvements in Turbine Water-Wheels, of which the following is a specification:

*Nature and Objects of the Invention.*

My invention has for its object to improve the construction of turbine water-wheels, to the end that they may be reduced in size, weight, and cost without lessening their power or efficiency. The invention consists in combining with the stationary bottom of a cylindrical case, having straight inclined chutes, a revolving wheel provided with a beveled periphery and with curved buckets, which, in their upper half, are mainly perpendicular to a plane parallel to the chutes, and in their lower half curved downward nearly to a horizontal plane, as hereinafter more fully described.

In the drawing, Figure 1 is a side elevation of the wheel; and Fig. 2, a section of part thereof, showing the form and local relation of the chutes and buckets.

A indicates a cylindrical case or water-reservoir supported by a suitable frame; B, the flume or conduit thereof; and C, a gate for controlling the flow of water to the wheel. The part D is formed of a ring provided with a series of openings, and with straight chutes E, which are set at an inclination of about forty-five degrees to the axis of the shaft F, and beveled on one side of their upper edges, as shown in Fig. 2. This part D is firmly secured to or formed in one piece with the case A. On the shaft F is keyed the wheel proper E, and the shaft is stepped in the frame in a suitable manner so that they revolve together. The wheel E is provided with buckets G, which are mainly perpendicular in their upper part *a* to a plane which is parallel to the chutes E′, and from thence they curve gradually downward to a horizontal plane. Against the part *a* the water delivered by the chutes strikes with a direct impulse, and thus imparts a maximum of force to the wheel E, causing it to revolve rapidly. The curved or extended lower portion of the buckets tends to increase the reactive impulse of the water, while the latter finds ready escape or exit in consequence of the periphery of the wheel E being flared or beveled outward from its upper to its lower edge. Thus the water accumulating in the reservoir A descends in a straight course directly against the part of the buckets perpendicular to the chutes, and is caused to give a further reactive impulse by reason of the construction of the lower part of the buckets, from which it finds ready escape.

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

The improved wheel formed by the straight inclined chute-plates E′ and buckets G *a*, curved as shown and described, and secured in a ring beveled or flared outward at its lower edge, all arranged and operating as set forth.

Toronto, October 18, 1870.

ASHLY DODGE COLE.

Witnesses:
C. T. CAYLEY,
JAMES PRINGLE.