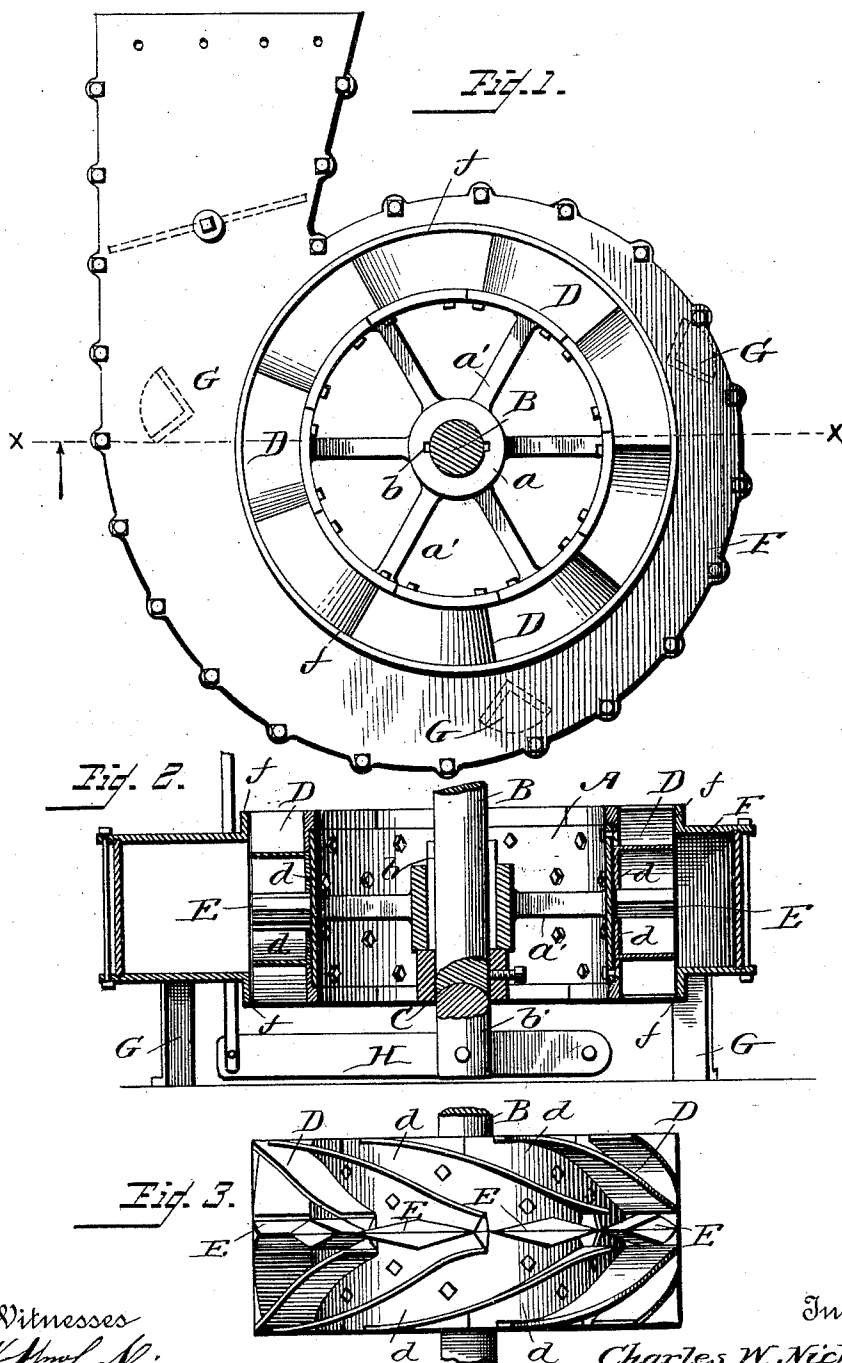


(No Model.)

C. W. NICHOLSON.
WATER WHEEL.

No. 473,773.

Patented Apr. 26, 1892.



Witnesses
Wm. H. Hildner.
Van Bursum Hildner.

Inventor
Charles W. Nicholson.
By his Attorneys
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UNITED STATES PATENT OFFICE.

CHARLES WESLEY NICHOLSON, OF ASSAMOOSICK, VIRGINIA.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 473,773, dated April 26, 1892.

Application filed January 14, 1892. Serial No. 418,073. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WESLEY NICHOLSON, a citizen of the United States, residing at Assamoosick, in the county of Southampton and State of Virginia, have invented certain new and useful Improvements in Water-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to turbine water-wheels especially designed for grudging-mills, but which is susceptible of general application.

The object of the invention is to improve the general construction and increase the efficiency and render more durable this class of machines.

The improvement consists of the novel features and the peculiar construction and combination of the parts, which will be hereinafter more fully described and claimed, and which are shown in the annexed drawings, in which—

Figure 1 is a top plan view of a water-wheel embodying my invention. Fig. 2 is a cross-section about on the line xx of Fig. 1, looking in the direction of the arrow. Fig. 3 is a side elevation of the wheel detached from the case.

The water-wheel is composed of a broad imperforate rim A, hub a , and spokes a' , and is held to revolve with the shaft B by a feather-and-spline connection b , being supported on the said shaft at the proper place by a collar C, which is secured on the shaft by a binding-screw in the usual manner. The buckets or wings D are provided in pairs, the buckets of each pair being placed opposite to each other and on opposite sides of a plane passed through the rim of the wheel midway of the edges thereof. The buckets are arranged obliquely across the rim of the wheel and curve outward in symmetric lines from the outer ends to a medial point, from which point they curve slightly inward to the inner ends, which ends do not touch and terminate at points equidistant from the said medial line of the wheel. Diamond-shaped deflectors E are arranged in the angle formed between the buckets of each pair of the said

buckets and serve to deflect the water against the sides of the buckets without impeding or detracting from the force of the water in any manner. The minor axes of the deflectors E are equal to the distance between the inner ends of the buckets and the major axes are about equal to the distance between the inner ends of two adjacent pairs of buckets. The deflectors are arranged within the belt, which latter is equal in width to the distance between the inner ends of a pair of buckets. The diamond-shaped deflectors have their ends nearly touching and the inner ends of the buckets terminate opposite the spaces between the said deflectors. The case F is scroll-shaped and is mounted on legs G, (three in number,) which are angle-shaped and arranged with the angle facing the axis of the wheel, so as to offer a minimum resistance to the escape of the water. The top and the bottom portions of the case have each a vertical flange f , which terminates about in the plane of the ends of the wheel and which encompass the peripheral edges of the said buckets. The purpose of these flanges f is to retain the water longer in contact with the buckets. The lower end of shaft B is stepped on the stud b' , which is secured to and projected up from an adjustable cross-piece H. The collar C extends over the joint between the said stud b' and the lower end of the shaft and serves as a cuff to retain the shaft B on the said stud. By reason of the feather-and-spline connection b the wheel can be lifted from the case F and elevated to a proper position on the said shaft for purposes of repair to the said wheel or the case.

It will be observed that for purposes of simplifying the construction of the wheel the buckets D, are provided with a foot or lateral flange d , by means of which they are bolted to the rim of the wheel. A longitudinal half of the deflector E is formed with the bucket and the flange d , the two halves forming the complete deflector when the parts are assembled and secured together. The bucket, flange, and half of the deflector are integrally formed, being cast in one piece.

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

1. A water-wheel comprising a broad im-

perforate rim, and diamond-shaped deflectors arranged around the rim midway between the edges thereof and having spaces between the opposing ends of the said deflectors and buckets about equal in height to the height of the deflectors, provided in pairs and obliquely disposed on opposite sides of the said deflectors, the inner ends of the buckets being separated and coming opposite the spaces between the ends of the said deflectors, substantially as specified.

2. A water-wheel comprising a broad imperforate rim and diamond-shaped deflectors and buckets secured to the said rim, the buckets being arranged in pairs, and a bucket of each pair having integrally formed there-

with a longitudinal half of the said deflector, substantially as and for the purpose described.

3. A water-wheel comprising a broad imperforate rim and buckets and diamond-shaped deflectors secured to the said rim, the buckets being in pairs and having a flange or foot and a longitudinal half of the deflector formed therewith, substantially as described, for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES WESLEY NICHOLSON.

Witnesses:

M. F. LEIGH,
J. E. CHARLES.