W. N. Whipple,

Water Wheel.

No. 112,100. Patented Feb. 21. 1871.

fig. 1.

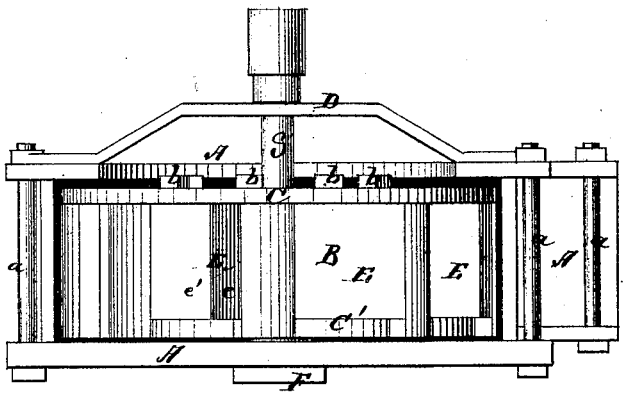
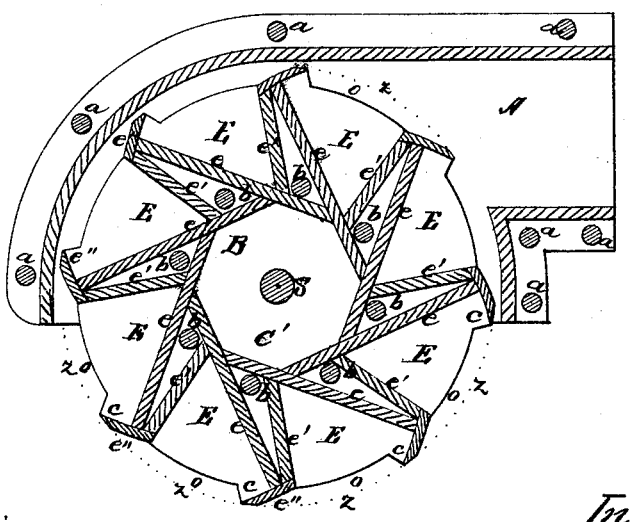


fig. 2.



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WILLIAM N. WHIPPLE, OF NILES, NEW YORK.

Letters Patent No. 112,100, dated February 21, 1871.

IMPROVEMENT IN 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, WILLIAM N. WHIPPLE, of Niles, in the county of Cayuga and State of New York, have invented a new and useful improved Water-Wheel; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a side view, and

Figure 2 a horizontal section.

Similar letters of reference in the drawing indicate corresponding parts.

This invention relates to that class of wheels which receive the impact of the water tangentially, and consists in a peculiar construction of the buckets that adapts the wheel to operate successfully either in a horizontal or vertical position; and also in a construction of the bottom plate that enables the wheel, when placed horizontally, to discharge the water more readily than heretofore.

In the drawing—

A represents the curb;

B, the wheel;

S, the shaft;

D F, the bearings of the shaft; and

a a, the bolts that fasten together the different parts of the curb.

Of the wheel, C is the upper and C′ the lower plate or disk, the two being connected together by the bolts *b b*, the bucket-plates, and, if necessary, the shaft S.

The buckets are represented at E E, and are formed by means of long plates *e e* and short plates *e′ e′*, arranged alternately so as to form a sharp angle at their outer ends, and abutting against each other at their inner ends, as clearly shown in fig. 2, whereby they mutually support each other and serve to strengthen the wheel.

The bolts *b b*, it will be observed, pass through triangular spaces formed between the plates *e e′*, so that as the nuts are tightened up the top and bottom plates are forced against a firm bearing surface all around the bolts, whereby great strength and firmness are imparted to the whole structure.

At the outer ends of the plates *e′ e′* they abut against plates *e″ e″*, slightly curved, and set so that their plane is nearly perpendicular to that of the longer plates *e e*.

The bottom plate of the wheel is adapted to support them, being provided with cam-shaped projections *c c*. In other words, it is not a perfect circle, as it would be if its outlines coincided with the dotted lines *z z*, fig. 2, but between the front edge of one plate, *e″*, and the rear side of the next it is cut away, as shown at *o o o*.

It will be observed that none of the bucket-plates are radial, those represented at *e′ e′* being slightly and those at *e e* much inclined, while those shown at *e″ e″* are nearly tangential.

The inclination of the longer plates *e e* is the main point in this part of the construction of my wheel, its design being to present these plates squarely to the impact of the water, so as to utilize its full force.

The inclination of the plates *e′* is such as to cause the length of the buckets, measured on the plates *e*, to equal the width of the chute, and to prevent the water from wasting its force by exerting it in a direction toward the center of the wheel, as would be the case were the plates *e′* not employed.

The function of the plates *e″* is, of course, to arrest the water in its effort to escape at once from the periphery of the wheel, and cause its force in that direction to be exerted rather upon the wheel itself than upon the curb.

The object of cutting away the disk C′ at *o o o* is to enable the water to escape the more readily over the outer edge of said bottom plate, as soon as the bucket shall, by the rotation of the wheel, have escaped from the curb.

The inclination of the parts *e e′ e″* and the construction of the plate C′ further subserve the purpose of enabling the spent water to escape readily, in the following manner:

The centrifugal force exerted upon said water while in the bucket, by the rapid rotation of the wheel throws a portion of it against the inner surface of the plates *e″ e″*, and thence it is forced backward, escaping at once over the edge of the bottom plate by reason of the part *o o* having been cut away, as will be readily seen by an inspection of fig. 2.

The water at this part of the wheel's revolution is not allowed to back into the sharp angle formed by plates *e e*, near the center of the wheel, whereby it would lose the momentum that its weight would have if held near the outer edge of the wheel; but is actually held away from the center of the wheel by the plate *e′*, so that it is prevented from centripetal action, and the whole momentum of its weight, acting with the longest possible leverage, is attained, and when its full effect has thus been exerted upon the wheel the water is discharged with great velocity, and the bucket is entirely freed from it during the remainder of the revolution.

The effect of the plates *e′ e′* is therefore threefold, to wit, to furnish additional bearing surface for the top and bottom plates around the fastening-bolts *b b*, to limit the length of the bucket to the width of the chute, and to prevent the spent water from backing toward the center of the wheel, and hold it away

from the center, so as to utilize its momentum and expel it swiftly from the bucket when no longer needed.

Having thus described my invention,

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

1. In a water-wheel, the plate C', when formed with the recesses *o o* and the projections C, substantially as and for the purpose specified.

2. The arrangement of the plates *e'' e''*, in connection with the plates *e e'*, the bolts *b b*, and the top and bottom plates C C', the whole being constructed substantially as and for the purposes set forth.

WILLIAM N. WHIPPLE.

Witnesses:

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