

A. H. MERRIMAN.

Improvement in Water-Wheels.

No. 115,082.

Patented May 23, 1871.

Fig. 1.

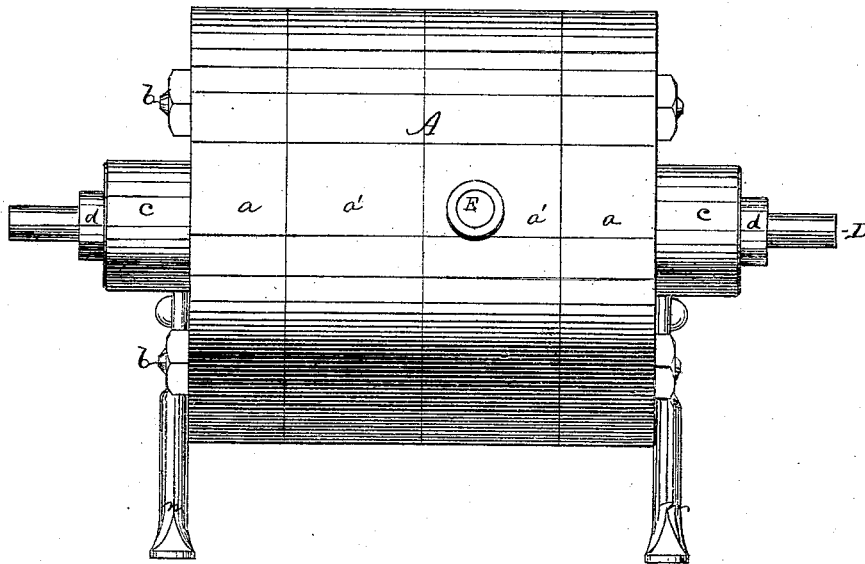
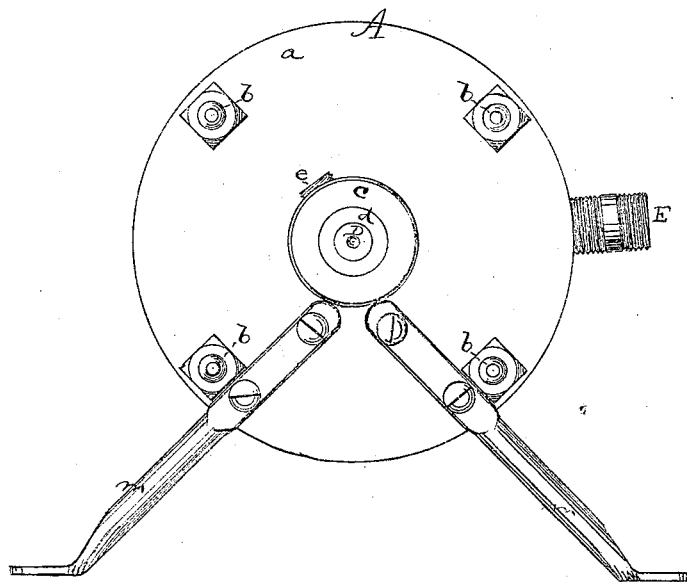


Fig. 2.



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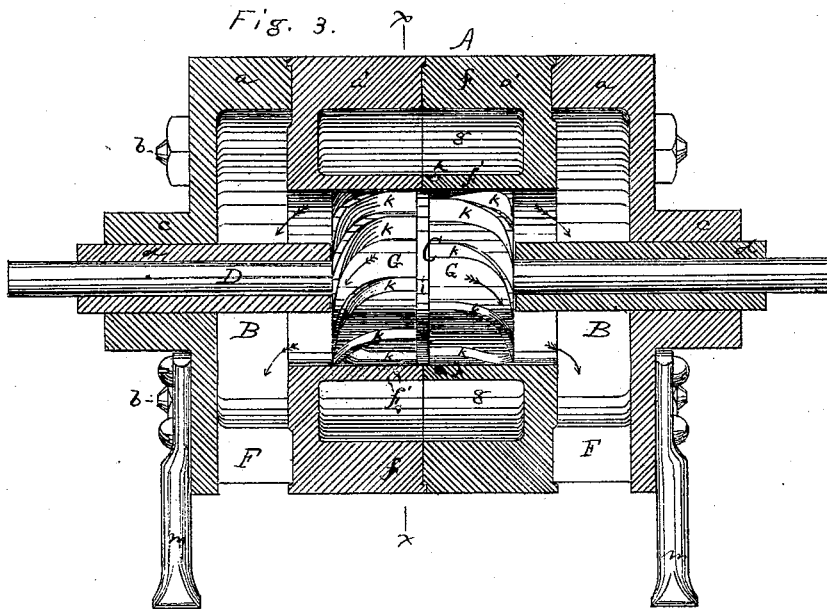
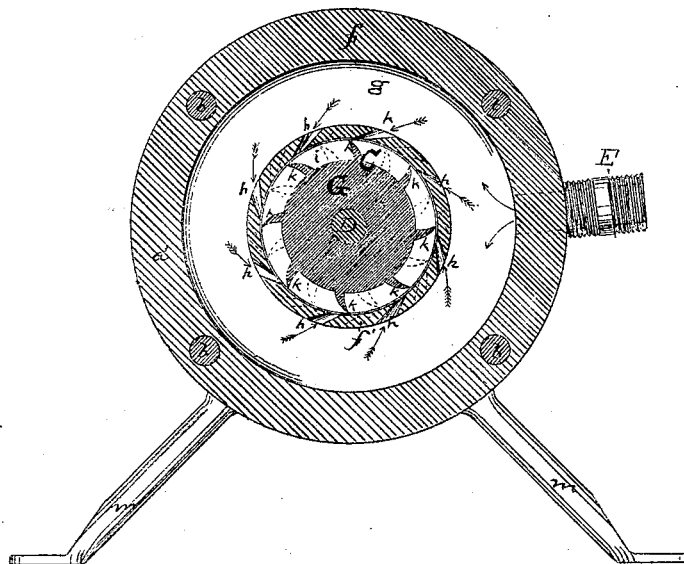


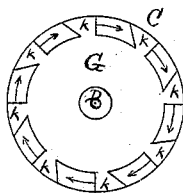
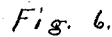
Fig. 4.



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Fig. 5.



Inventory.

Alanson H. Merriam, <sup>7</sup>  
By James Shepard, atty.

# UNITED STATES PATENT OFFICE.

ALANSON H. MERRIMAN, OF WEST MERIDEN, CONNECTICUT.

## IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 115,082, dated May 23, 1871.

I, ALANSON H. MERRIMAN, of West Meriden, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Water-Wheels, of which the following is a specification:

My invention consists of the peculiar construction, arrangement, and combination of the parts as hereinafter more fully described.

In the accompanying drawing of my invention, which illustrates a wheel and its case, Figure 1, Sheet 1, is a side elevation thereof; Fig. 2, Sheet 1, an end view; Fig. 3, Sheet 2, a vertical longitudinal section of the case, and a side elevation of the wheel; Fig. 4, Sheet 2, a transverse section on line *x x*, Fig. 3; Fig. 5, Sheet 3, a top view of the case partly in section; and Fig. 6, Sheet 3, an end view of the wheel.

A designates the exterior case, which is composed of four rings, *a a' a' a*, properly turned up in a lathe, their meeting edges or sides rabbeted (see Fig. 3) so as to insure of their being properly matched together. The said rings are held in place by the rods or bolts *b b b b*, extending longitudinally through the case A. The end rings *a a* are each provided with a solid end, in the center of which is a hub, *c*, in which the journal-boxes *d d* are secured by means of the screws *e e*, Figs. 2 and 5. The rings *a' a'* are provided with a double wall, *f f'*, which walls are connected to each other at the outer end of the central rings *a' a'*, thus forming, when the rings are placed together, a closed annular chamber, *g*, around the inner wall or case *f'*, Figs. 3, 4, and 5. Inside of the inner case *f'* is a straight cylindrical space or chamber, which opens into the discharge-chambers B B, Figs. 3 and 5, formed in the rings *a a*. Immediately inside of the case *f'* is the wheel C, mounted on a shaft, D, having bearings in the boxes *d d*. The shaft D may be made of any desired length, and provided with driving-pulleys at each end. To the outer wall *f* of the case A a pipe, E, is connected in any proper manner, so as to admit water into the chamber E and fill the same. Small, round, tapering holes are made tangentially through the inner case *f'* to form the chutes *h*. I form one-half of these chutes *h* in each of the rings *a' a'*, with each chute in one ring opposite the blank space between the chutes in the other ring, as shown in Fig. 5, and indi-

cated by the broken lines in Fig. 4. The rings *a a* are each cut away at their lower side to form an opening, F, through which openings the water is discharged from the case A. The wheel C is composed of a central hub, G, with an annular rim, *i*, in the center of its length. On each side of the rim *i* are scroll-buckets *k*, secured thereto by solder or otherwise, those upon one side being placed opposite the space between those of the other side, as shown at Fig. 3, and indicated by broken lines at Fig. 4. The buckets *k*, or, more properly, the portion of them which is immediately in front of the chutes *h*, is concave upon one side and convex upon the other, and rounded up to an edge, as shown in Fig. 4.

The water is forced upon the convex side of the buckets *k*, which has a tendency to throw it outward further from the center of the wheel, whereby it has a greater leverage than if the form of the buckets were such as to throw the water inward. In case any dead water is in the wheel the hooked form causes the buckets to dip into the water easily and throw it from the wheel. As the buckets *k* approach the ends of the wheel C they gradually lose the concave and convex form of their sides, and are curved in the direction of their length, and are also widened at their edge in order to properly contract their discharge, the capacity of which discharge should be about equal to the capacity of the chutes *h*.

The water, being let in through the pipe E, fills the chamber *g* and passes through the chutes *h*, as indicated by darts in Figs. 4 and 5, into the space between the buckets *k*, and is discharged therefrom in the direction indicated by darts in Figs. 3 and 6, falls upon the boxes *d d*, into the discharge-chambers B B, (see darts, Figs. 4 and 5,) and thence out of the case A through the openings F.

The wheel C is shorter than the inner case *f'*, (see Fig. 4,) whereby the water is retained in the wheel until it has expended all its force, and thereby yielding a greater percentage of power than it would with buckets of the same discharging-area placed on a wheel with its ends even with the end of the case.

To put up the wheel, it is only necessary to secure the case by screws, through the feet of the legs *m*, to a small frame, provide a ditch to conduct away the spent water, and to con-

nect the case A by an extension of the pipe E to the water-supply.

If desired, the openings F F may also be provided with a pipe to conduct off the spent water, in which case the wheel can be put up in any desired place in a shop or house.

In place of the rings *a a* arms might be bolted to the sides of the center rings *a' a'* to secure the boxes *d d* in place; but the arrangement herein shown and described is considered preferable.

This wheel is principally designed as a motor, to be run by water from city water-works, &c., where a great head can be obtained; but, by making it on a larger scale, may be used in other places.

I do not claim a wheel composed of a central hub and scroll-buckets, as many such wheels are in common use.

The leading advantages of my invention are, that the device is quickly and cheaply put up in position to run, as it is virtually a portable wheel set up before it leaves the factory; that it can readily be taken apart for cleaning or other purposes, by simply removing the nuts on one end of the rods or bolts *b*; that the buckets continually discharge the water upon the boxes *d d*, and thereby keep them cool and less liable to friction; and that the round chutes are cheaply made with a smooth inner surface by simply drilling and reaming, and discharge a greater amount of water with less friction than chutes of any other form.

I claim as my invention—

1. The combination and arrangement of the wheel C, shaft D, boxes *d d*, and the case A with its compartments as shown, the whole combined and operating together substantially as described.

2. The combination of the wheel C and annular water-chamber *g*, formed in the metal case A by the outer and inner walls *f f'* of the rings *a' a'*, the whole being combined and arranged in a portable water-wheel and case, substantially as described.

3. The arrangement of the wheel C and the boxes *d d*, the wheel discharging at both ends and mounted on a horizontal shaft, as described, whereby the spent water is continually discharged upon both of the boxes, as and for the purpose set forth.

4. The combination of the wheel C, case *f'*, and the series of round chutes *h*, tangentially arranged therein, as described.

5. The buckets *k*, when constructed with the portion immediately in front of the chutes concave upon one side and convex upon the other, and brought to an edge, as shown and described, in combination with the chutes *h*, arranged to throw the water upon the convex side of the buckets, substantially as described.

ALANSON H. MERRIMAN.

Witnesses:

JOHN Q. THAYER,  
ORVILLE H. PLATT.