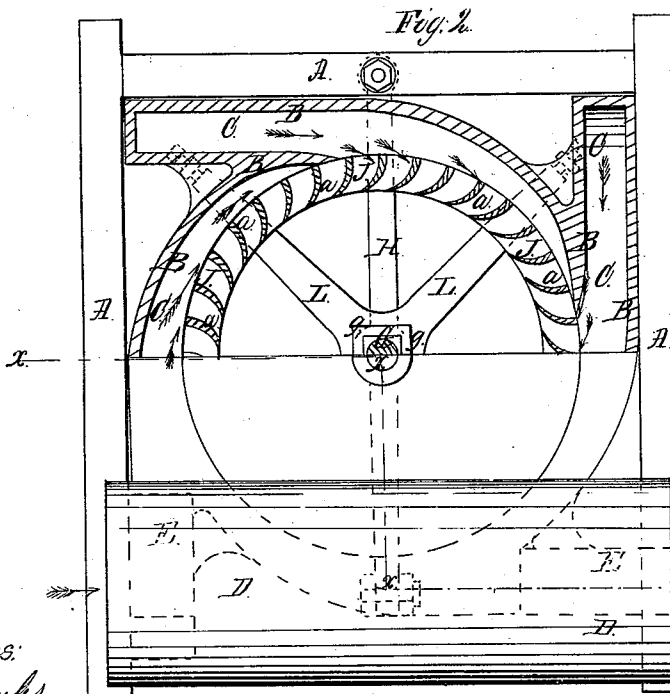
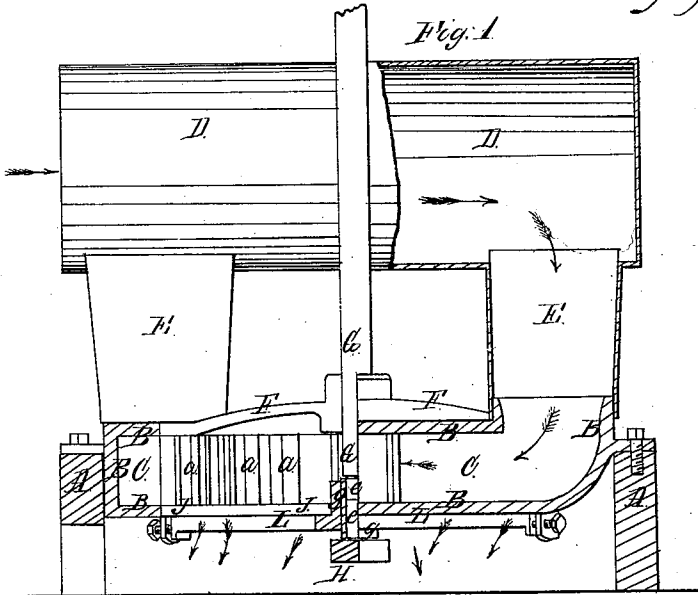


J. Martin,
Water Wheel.

N^o 28,992.

Patented July 3, 1860.



Witnesses:
H. W. Combs
R. S. Spencer.

Inventor:
James Martin
per Munn & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES MARTIN, OF FLORENCE, ALABAMA.

WATER-WHEEL.

Specification of Letters Patent No. 28,992, dated July 3, 1860.

To all whom it may concern:

Be it known that I, JAMES MARTIN, of Florence, in the county of Lauderdale and State of Alabama, have invented a new and useful Improvement in Center-Discharge Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a vertical section of my improved water wheel, taken through the red lines *x, x, x*, of Fig. 2. Fig. 2 is a plan view of Fig. 1, with one-half of the top rim of the wheel removed, and also the plate covering the scroll removed to show the interior arrangement of the parts and the action of the water against the buckets.

Similar letters of reference indicate corresponding parts in both figures.

My invention is a certain novel arrangement of parts, whereby a full head of water may be brought to act upon all the buckets of a center-vent wheel at the same time the water will have a free discharge and will not be crowded back against the bucket as is the case with turbine wheels generally. The issues or influx of water is in such a relation to the buckets as to suit the different velocity of the wheel under different heads of water. The water will act upon the buckets with greater effective force or impact, and the whole will be constructed in a very simple and compact manner as will be hereinafter described and represented.

To enable those skilled in the art to fully understand my invention, I will proceed to describe its construction and operation.

In the drawings, A, represents an outer framework supporting plates B, B, B, which form four chutes C, C, C, C, each of which direct the water to the rim of the wheel in a tangential line with its circumference. These four chutes receive the water from two horizontal sluice chambers or cisterns D, D, through vertical pipes E, E, at each end of said chambers D, which pipes fit over flanges in the mouths of each chute. The outer wall of each chute incloses one quarter of the circumference of the wheel, with the chamber terminating at the circumference of the wheel, where the inner wall of the preceding chute or chamber terminates. The wheel is thus acted

upon by four distinct streams of water from one head, and issuing upon the buckets at each quarter of the wheel's circumference.

The wheel consists of a plate of cast iron F, flat around the margin, and dished toward the middle. The spindle G, passes through the central eye of the plate F, and is securely keyed to said plate, the buckets are arranged between an annular rim J, the width of the margin of the plate F, and the width of the bucket, *a*. These buckets *a*, are curved as represented by Fig. 2, representing segments of a circle whose radii is equal to the breadth of the rim, J, of the wheel, and are spaced on the outside about 4 inches apart with the openings on the inside of the rim J, sufficiently large to discharge 100 per cent. of water while the delivery of the chutes or veins under a head of from two to four feet, 70 per cent. and under a head of from 4 to 8 feet, 65 per cent. Or in other words, if I deliver into each bucket $\frac{3}{4}$ of an inch of water, the inside openings of said buckets should have a discharging area of $1\frac{1}{4}$ inches or 100 per cent. to the 60 per cent. delivered.

The vertical spindle G of the wheel is stepped in a loose pin *e*, resting on a cross bridge H, which bridge is made adjustable, so as to raise or depress the wheel and spindle when occasion requires. The pin is not secured to the bridge, but is kept in a vertical position by a square box *g*, which sets in a corresponding recess in the horizontally adjustable bars L. By this combined arrangement the wheel can be kept in a true horizontal position, and in a true relative position to the outer casing or chute chambers.

From what has been described, it is easy to understand the general mode of action of the machine. The water passes down through the vertical pipes E, E, and through the four compartments formed by the direction-curves or walls of the chutes C, C, C, C, impinging against the curved or hollow faces of the wheel's buckets. These recede from the impulse, and from their connection with the central shaft G, a centrifugal force is imparted to the water which causes it to approach the center of motion with a force and velocity determined by the angular velocity of rotation; and in consequence of the great velocity of escape of the water toward the

center of the wheel, a great amount of reaction is added to the impulsive force of the fluid, giving thereby an increase of power.

What I claim as my invention and desire
5 to secure by Letters Patent, is—

In center-vent water wheels, the combination of the horizontal sluices D, D, vertical pipes E, E, and chutes C, C, when arranged

relatively with the buckets of the wheel, the whole constructed and operated in the manner and for the purpose set forth. 10

JAMES MARTIN.

Witnesses:

JOHN W. COLE,
H. C. MARTIN.