

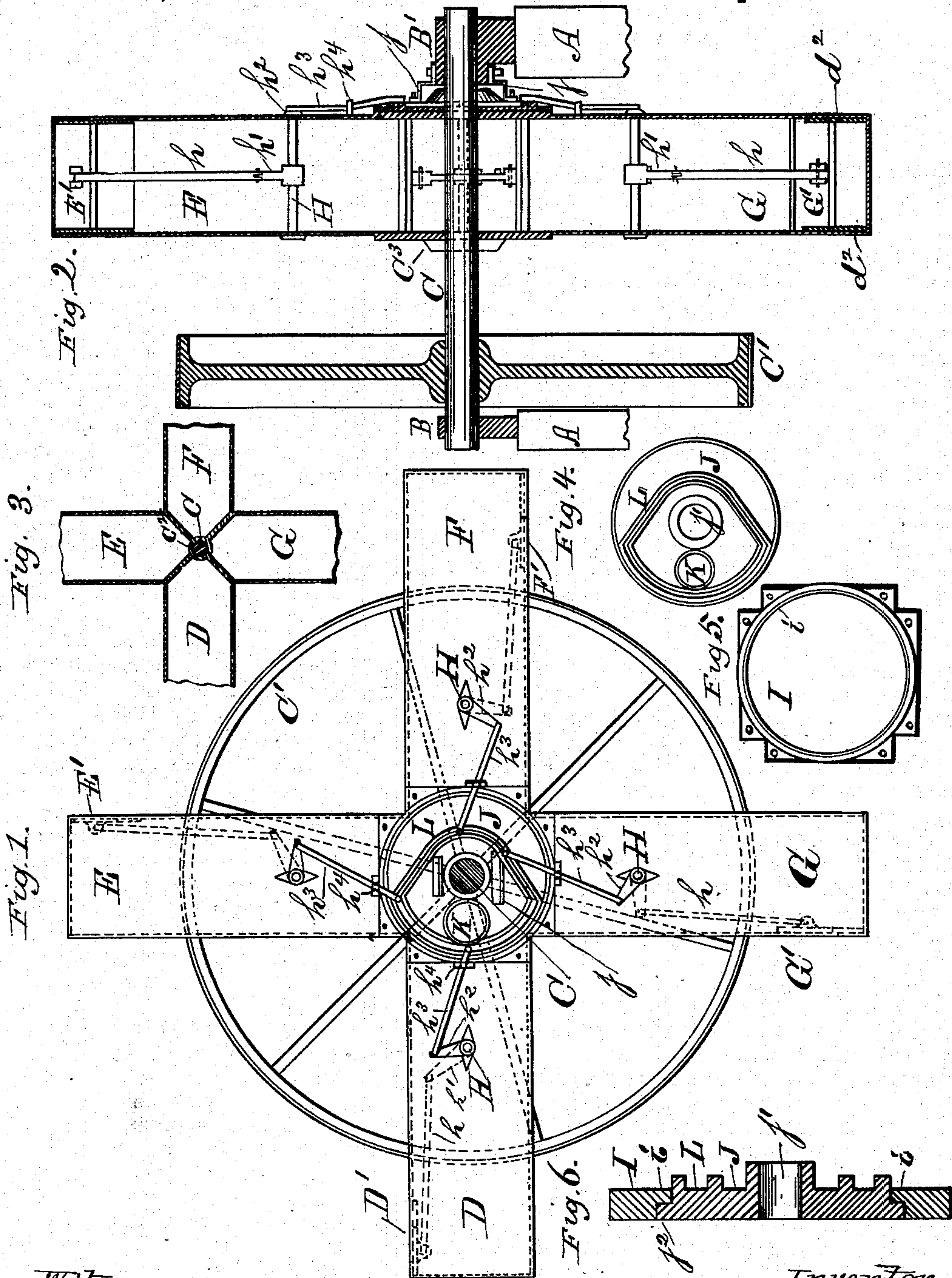
(No Model.)

M. I. MARTIN.

WATER WHEEL.

No. 276,442.

Patented Apr. 24, 1883.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

MICHAEL I. MARTIN, OF FORT WAYNE, INDIANA.

## WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 276,442, dated April 24, 1883.

Application filed January 15, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, MICHAEL I. MARTIN, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, 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, referring to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevation, partly in section, Fig. 2 a central vertical section, and Figs. 3, 4, 5, and 6 are details of a water-wheel constructed in accordance with my invention.

Like letters refer to like parts in all the figures.

A A represent in part any suitable foundation, upon which journal or bearing blocks B B' rest, in which blocks a horizontal shaft, C, rotates. A belt-pulley, C', is fixed to the shaft and rotates therewith.

The water-wheel proper comprises, in this instance, four radial chambers, D, E, F, and G; but, if desired, the number of chambers may be increased. Each of the chambers is rectangular in cross-section and V-shaped at its inner end, and all are arranged about the shaft C at a right angle thereto, and in this instance, there being four chambers at a right angle to each other. A sleeve, C<sup>2</sup>, (see Fig. 3,) may be formed at the inner ends of the chambers, and thus strengthen the connection of the same to the shaft C; or the chambers may be keyed at one side, as at C<sup>3</sup>, to the shaft, in order that they shall revolve therewith. The chambers may be constructed of cast or sheet metal, or any other suitable material, and separately or in one piece or casting; and, if preferred, openings may be formed in the walls of the V ends of the chambers, to provide direct communication from one to the other. At the outer or free end and at one side of each chamber is a discharge-opening, over which a gate, D', E', F', and G', respectively, is adapted to slide, being retained in proper position by cleats d<sup>2</sup>, or it may be by grooves formed in the walls of the chamber, or by the pressure of the water within the chamber, in which latter case the gates would be pivoted to the wall, instead of sliding, as shown. Each

of the gates is connected by a link, h, to an inner arm, h', of a shaft, H, passing transversely through the chamber, and journaled in its sides, and provided with an outer arm, h<sup>2</sup>, to which is pivotally secured a rod, h<sup>3</sup>, passing through a guide, h<sup>4</sup>, fastened on the outside of the chamber. If preferred, the shafts H need not extend entirely across the chambers, but may merely pass through one of the sides thereof, to communicate motion from the arm h<sup>2</sup> to the arm h'. By this modification there is less liability to retain floating substances within the chambers. To further overcome this liability, the shaft H, with its arm h' and the link h, may be mounted upon the outside of the chamber, the latter in such case being connected to the outside of the gate and near its outer edge, so that nothing would be located within the chamber to obstruct the passage of the water or floating substances therein. One side of the inner ends of the chambers constitutes a flanged ring, I, (see Figs. 5 and 6,) and this may be either secured by bolts to the chambers or cast in one piece therewith, in which latter case the flange or rabbet i would be formed separately and secured to the ring by bolts, in order to permit the insertion of a dead-plate, J, which is rigidly secured to the bearing B' by brackets j j, and is bored centrally to form a bearing, j', in which the shaft C rotates. At one side of the bearing j' is an opening, K, for the admission of water into the chambers, in a manner hereinafter described. The dead-plate is also provided with a flange, j<sup>2</sup>, (see Fig. 6,) adapted to fit the flange i of the ring I, and with a groove-cam, L, which for about one-third of the circumference of the plate is concentric therewith, and is then contracted to gradually approach toward and pass concentrically about the center thereof. The inner ends of the rods h<sup>3</sup> are adapted to ride in the groove of the cam L, and for this purpose may be provided with the usual anti-friction rollers.

From the above description it will be seen that the chambers and shaft may revolve together as one piece, the bearings for the latter being the blocks B B', and those of the former being the block B and the dead-plate J, the immediate latter bearing-surfaces being the flanges i j<sup>2</sup>.

From any suitable source of supply water is



conducted by a pipe through the opening K into the chambers as they pass the same, the dead-plate J forming the sides of the chambers at and about the opening K. The water freely enters each chamber as it arrives opposite said opening. As it enters a chamber—D, for instance—the weight of the water therein causes it to drop or revolve to a position directly below the shaft. This movement brings the chamber E opposite the opening; and it, also becoming filled, likewise revolves. At this point provision is required for relieving the chamber D of at least a portion of the weight of the water therein, in order that it may not counteract the full effect of the water entering chamber E, and for this purpose the contour of the cam L is such as to draw the rod  $h^3$  toward the shaft C, and thus open the gate D' at the time the chamber reaches a vertical position beneath the shaft, and to retain the gate in open position until the chamber reaches a horizontal position directly opposite that at which it started. It will be noticed that when a chamber is receiving water its gate is at or in its upper side, and when discharging water its gate is at or in its lower side, thus utilizing its functions of retention and discharge at the most advantageous positions which it assumes during the revolution of the chamber. During each revolution of each of the chambers its gate is thus operated and the reception and discharge of water produce a revolution of the entire series of chambers or the wheel proper, and this motion may be by a belt on pulley C', or by suitable connections with the shaft C, communicated to any desired machinery for practical purposes.

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

1. A water-wheel comprising a horizontal shaft, a series of chambers arranged about the same, a dead-plate fixed to one of the shaft-

bearings, and means located within the circumference of the wheel for successively opening and closing gates located at the outer ends of the chambers, substantially as shown and described.

2. In a water-wheel, the combination of a horizontal shaft, a series of chambers having inner V-shaped ends, a dead-plate provided with a bearing-flange and secured to the shaft-bearing, and with a cam-groove and inlet, and gates located at the outer ends of the chambers, and means for operating the gates, substantially as specified.

3. The combination of the shaft C, chambers D, E, F, and G, provided with gates D', E', F', and G', rods  $h$ , shafts H, having arms  $h'$   $h^2$ , rods  $h^3$ , dead-plate J, having cam L and opening K, the bearing B' and brackets  $j$   $j$ , substantially as shown and described.

4. The combination of the shaft C and chambers D, E, F, and G, provided with the flanged ring I, with the dead-plate J, having the flange  $j^2$ , and secured to the bearing B', substantially as specified.

5. The combination of the shaft C and the chambers D E F G, adapted to rotate therewith, and provided with gates, with the fixed dead-plate J, provided with a cam, L, the transverse shafts H, having inner and outer arms,  $h'$   $h^2$ , and mechanism connecting the cam shafts and gates, substantially as shown and described.

6. The combination of the shaft C, bearing B', and dead-plate J, secured to the bearing by brackets arranged inside of the cam L, substantially as specified.

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

MICHAEL I. MARTIN.

Witnesses:

HUGH McDEIHL,  
JOHN SCHROEDER.