2 Sheets--Sheet 1.

JOHN F. M. DOAN.

Improvement in Current Water-Wheels.

No. 115,718. Patented June 6, 1871.

Fig. 1.

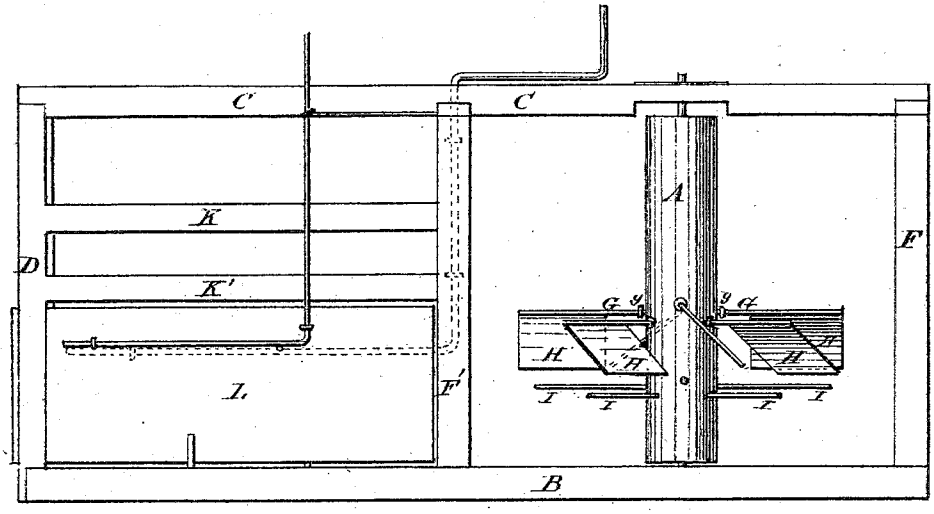
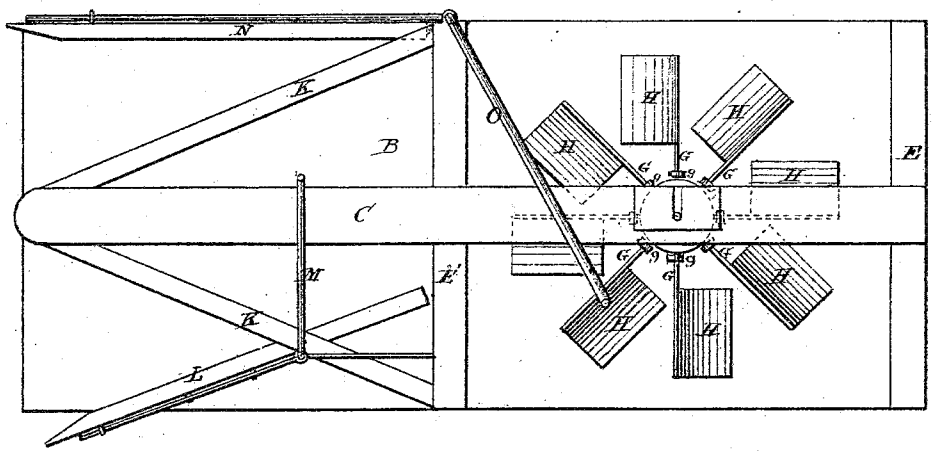


Fig. 2.



Witnesses.

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Jamt. F. Mann

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by Prindle & Dyer, Attys.

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

2 Sheets--Sheet 2.

JOHN F. M. DOAN.

Improvement in Current Water-Wheels.

No. 115,718. Patented June 6, 1871.

Fig. 3.

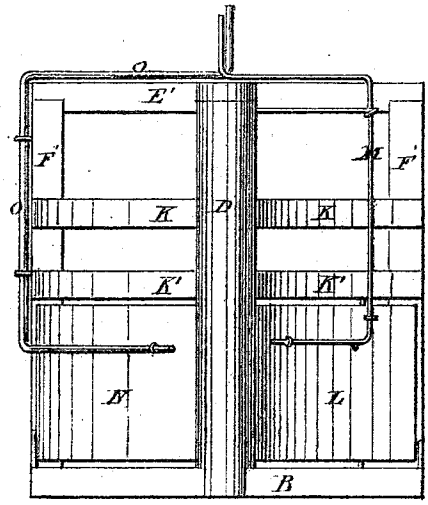
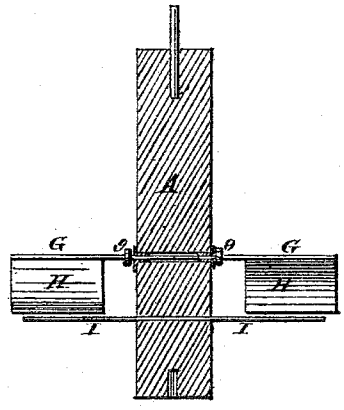


Fig. 4.



Witnesses.

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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNES PROCESS.)

UNITED STATES PATENT OFFICE.

JOHN F. M. DOAN, OF NILES, MICHIGAN.

IMPROVEMENT IN CURRENT WATER-WHEELS.

Specification forming part of Letters Patent No. 115,718, dated June 6, 1871.

To all whom it may concern:

Be it known that I, JOHN F. M. DOAN, of Niles, in the county of Berrien and in the State of Michigan, have invented certain new and useful Improvements in Current Water-Wheels; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a side elevation of my improved device. Fig. 2 is a plan view of the same. Fig. 3 is an end elevation, showing the arrangement of the gates; and Fig. 4 is a vertical central section of the wheel.

Letters of like name and kind refer to like parts in each of the figures.

My invention is an improvement in current water-wheels; and it consists in the peculiar construction and arrangement of the gates for controlling the action of the current upon the wheel, substantially as is hereinafter specified.

In the annexed drawing, A represents a shaft, suitably journaled in a vertical position within a frame composed of a bottom plate and top rail, B and C, respectively, secured together at their forward ends by means of a post, D, and at their rear ends by means of a cross-bar, E, supported upon and attached to two posts, F. Passing horizontally and radially through the shaft A, immediately below its center vertically, is a number of metal rods, G, which, while free to revolve therein, are held in position longitudinally within said shaft by means of suitable washers *g*, secured upon the former and bearing against the sides of the latter. Secured to and depending from each end of the rods G is a float or bucket, H, constructed of any suitable thin material, in the general form shown, and placed at a right angle to the opposite float upon the same shaft, so that when one float is occupying a vertical or horizontal position its fellow has a relatively horizontal or vertical plane. A second series of rods, I, corresponding in number and in vertical position with the rods G, is secured within the shaft A so as to engage with the lower edges of the floats or buckets H and prevent them from passing beyond a vertical line in one direction.

As thus constructed, if the wheel is placed within a running stream of water those buckets that stand at an angle to the direction of the current will be swung down stream until one of each pair is arrested by the rod I, and occupies a vertical position, while its fellow upon the opposite side is placed horizontally within the water, in which positions the former will receive and impart to the wheel the full force of the current, while the latter will offer but a slight resistance to the same, by which means said wheel will be caused to revolve. As each pair of buckets reaches a position in line with the current the force of the latter is exerted equally upon each bucket; but, as the motion of the wheel carries said pair beyond said line, the bucket that was before feathered, receiving the force of the current, drops downward into a vertical position and feathers its fellows.

Although the feathered buckets are but slightly retarded by the force of the current, it is desirable that they should move in comparatively still water, and also that the full force of said current should be directed against the opposite side of the wheel, or, when desired, entirely shut off from the same, to accomplish which object the following-described means are employed: A second cross-bar, E′, is secured in position immediately beneath the top rail C, midway between its ends, by means of two vertical posts, F′, the latter of which is connected to the post D by means of three horizontal braces, K, the lowest of which, K′, is placed just above the surface of the water. A gate, L, corresponding in size and shape with the space between the posts D and F′ and the rail K′ and bed-plate or base B, is pivoted vertically at a point about one-third of its length from its rear end. A rod, M, provided at its upper end with a crank, is secured to said gate, and, extending upward in a line with its axis, furnishes the means whereby the same may be turned horizontally so as to direct the current of water from the feathering-paddles to and against those upon the opposite side of the wheel, as shown in Fig. 2. A second and corresponding gate, N, is pivoted at its rear end to or upon the post F, and has secured to it a crank-rod, O, by means of which said gate may be opened outward to a position in line with the current.

As thus constructed and arranged either gate may be wholly or partially opened, in or-

der to admit a greater or lesser amount of water to the wheel, when desired; or they may be closed, as shown in Fig. 3, so as to divide the current and cause it to pass upon either side of said wheel without exerting any force thereon.

This device possesses several advantages over those ordinarily used for a like purpose, among which are, first, the direct action of the current upon the operating buckets raises and holds firmly in a horizontal position those upon the opposite side of the wheel, instead, as heretofore, of allowing the latter to be raised by the direct action upon them of the current, so that the weight of each bucket would incline it downward to a greater or lesser angle, and thereby obstruct the motion of the wheel; second, the construction and arrangement of the gates are such as to permit the quantity of water admitted to the wheel and the strength and direction of the current to be adjusted with ease and accuracy.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

The gates L and N, provided with the crank-rods M and O, and pivoted within the frame, consisting of the bed-plate B, top rail C, posts D and F′, and the brace-rails K and K′, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of June, 1870.

JOHN F. M. DOAN.

Witnesses:
DAVID BACON,
JOHN KING.