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Letters Patent No. 83,579, dated October 27, 1868.

IMPROVED WATER-WHEEL.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, A. N. WOLF, of Sheridan, in the county of Lebanon, and State of Pennsylvania, and JOEL HAAG, of Bernville, in the county of Berks, and State of Pennsylvania, have invented certain new and useful Improvements in Double-Discharge Water-Wheels; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a longitudinal section;

Figure 2, a plan view, the upper cap being removed; and

Figure 3 is a perspective of the wheel.

Our invention consists in certain improvements in water-wheels, hereinafter more fully set forth.

In order to enable others skilled in the art to which our invention appertains, to make and use the same, we will now proceed to describe its construction and operation.

A represents the lower casing of a water-wheel, which casing, at a suitable distance from its outer periphery, is provided with a flange, around which a ring, *a*, is placed.

On the lower casing A, between its inner periphery and the ring *a*, are secured six chutes, B B, as shown in fig. 2. These chutes are so formed, that their inner ends run tangentially to the inner periphery of the casing, and the outer ends are bent, running along the inner side of the ring *a*.

The gates C C are pivoted to the casing A at its inner periphery, in a groove made for that purpose near the inner ends of the chutes B B, said gates extending to the next chute, completely closing the space between them. The outer ends of the gates are hinged to the ring *a* in such a manner, that, by turning said ring, all the gates are opened at the same time, and as far as may be desired, thus regulating the flow of water. The hinges *d d*, by which the gates are thus regulated, are secured to the ring *a* by means of pins, which are inserted into said ring, pass through the hinge, and are secured to another ring, similar to the ring *a*, placed above the chutes and gates. This latter ring fits into a corresponding recess on the lower side of the upper casing D, which is secured to the lower by means of bolts and screws, or in any other manner desired.

On the outer side of the ring *a*, as well as on the ring above the same, are a few cogs, *b b*, and a shaft is placed vertically through or secured to the upper and lower casings, on which shaft pinions *c* are secured. These pinions work in the cogs *b b*, so that by turning said shaft the rings are turned at the same time, opening or closing the gates.

It will thus be seen that the flow of water to the wheel can be easily regulated from above.

The wheel E, which is placed between the two casings A and D, the shaft F passing up through the latter, consists of an upper circular plate, to the lower side of which twelve buckets, F F, are secured, at equal distance from each other, the outer edges being even with the outer periphery of the circular plate.

The buckets F F are curved, as shown in figs. 2 and 3, and have each an outlet or opening towards the inner side of the wheel. The bottom or lower side of the buckets is formed of an inclined plate, I, forming another outlet for the water on the bottom or lower side of the wheel. The buckets are held together on their lower side by means of a ring, J, at their outer edge, and another, *e*, near their inner, between which two rings the bottom plates I I are firmly secured.

It will be seen that by this arrangement each bucket has two outlets for the water; and the bucket being formed of an arc, on which the water strikes and produces percussion, turning to a pressure, and discharges on an incline. The water strikes the arcs of the wheel in tube-shape, and always at the same point. It makes no difference how far the gates are drawn, one-half, one-fourth, or any other distance, it always strikes the same point on the wheel, and produces a great percussion and pressure.

Having thus fully described our invention,

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

The combination of the casing A, wheel E, chutes B B, hinged gates C C, and ring *a*, all constructed, arranged, and operated, substantially as set forth.

In testimony that we claim the foregoing as our own, we affix our signatures in presence of two witnesses.

A. N. WOLF.
JOEL HAAG.

Witnesses:

ISRAEL GARRETT,
WILLIAM H. LEININGER.