A. M. Harding.

Turbine Wheel.

No. 97,085. Patented Nov. 23, 1869.

Fig. 1.

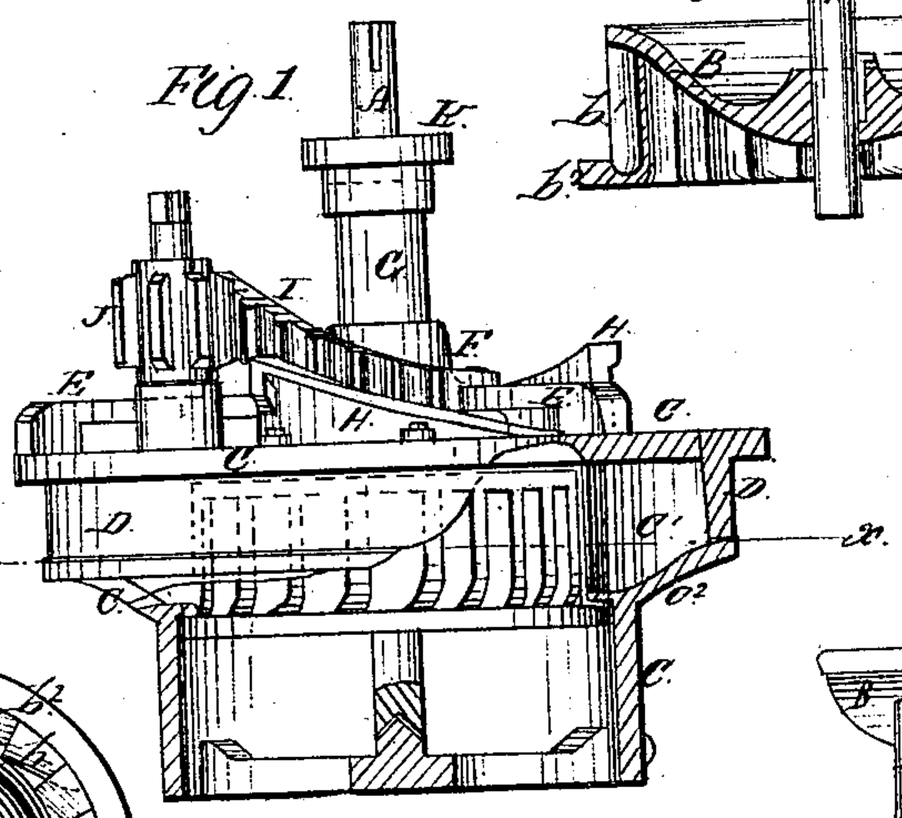


Fig. 4.

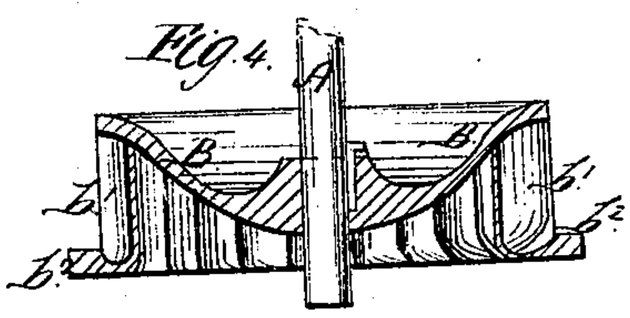


Fig. 5.

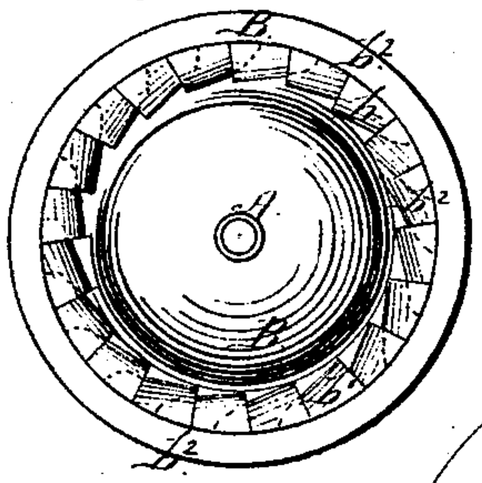


Fig. 6.

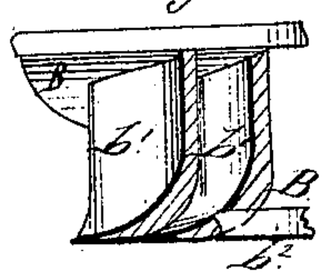


Fig. 2.

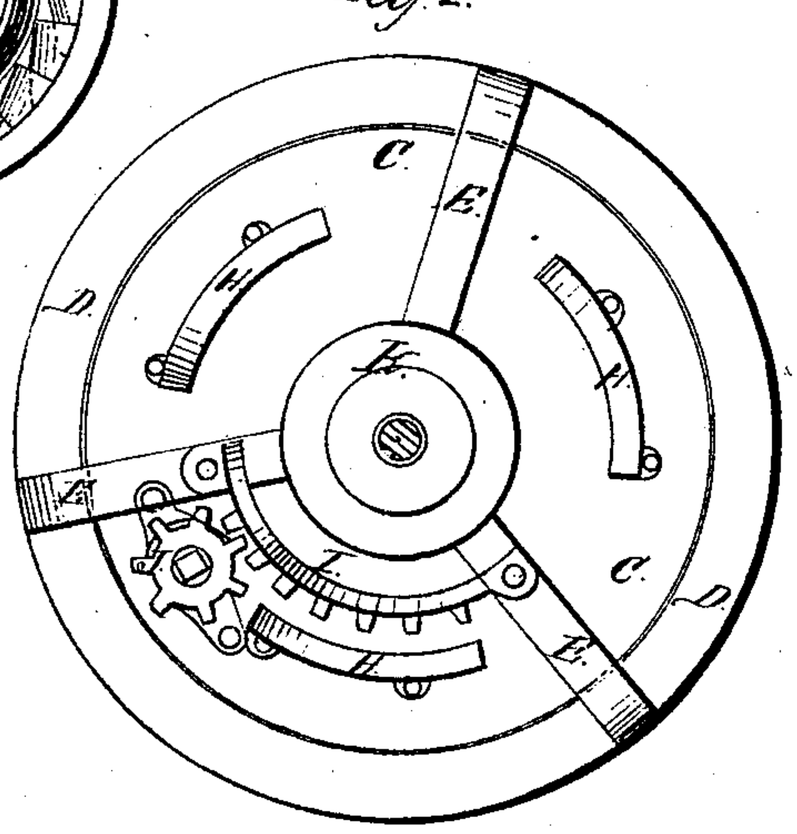
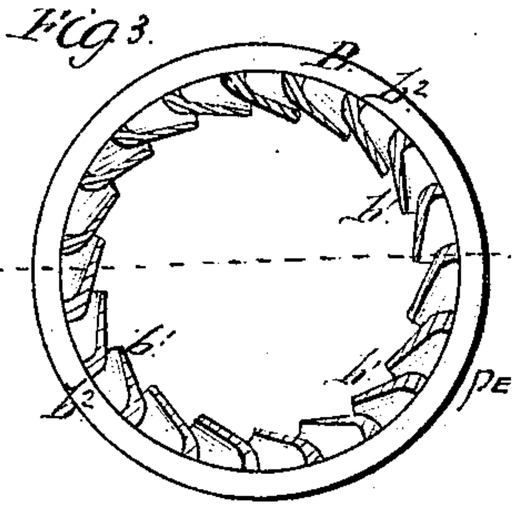


Fig. 3.



Witnesses.
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Geo. N. Mabee

Inventor
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per Munn & Co

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A. M. HARDING, OF OREGON CITY, OREGON.

Letters Patent No. 97,085, *dated November* 23, 1869.

IMPROVEMENT IN TURBINE WATER-WHEELS.

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

To all whom it may concern:

Be it known that I, A. M. HARDING, of Oregon City, in the county of Clackamas, and State of Oregon, have invented a new and useful Improvement in Turbine Water-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which--

Figure 1 is a side view of my improved water-wheel and case, part being broken away, to show the construction.

Figure 2 is a top view of the same.

Figure 3 is a detail horizontal section of the wheel, taken through the line *x x*, fig. 1.

Figure 4 is a detail vertical section of the same, taken through the line *y y*, fig. 3.

Figure 5 is a bottom view of the same.

Figure 6 is a detail sectional view of the same, showing the form of the buckets.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved water-wheel, which shall be simple in construction and effective in use, being so constructed and arranged as to economize the water, and enable its admission to be more conveniently regulated and controlled; and

It consists in the construction and combination of various parts, as hereinafter more fully described.

A represents the shaft, to which the wheel B is keyed, or otherwise securely attached.

The lower end of the shaft A is pivoted to some suitable support, in the ordinary manner.

The top of the wheel B is made concave upon its upper side, and convex upon its lower side, as shown in figs. 4 and 5.

Around the edge of the wheel B is formed a circle of downwardly projecting buckets, b^1, the lower parts of which are connected by a ring or flange, b^2, which forms the lower part of the rim of the wheel.

The inner sides of the buckets b^1 incline rearward and inward, and their lower parts or bottoms incline rearward and downward, as shown in figs. 3, 4, 5, 6, so as to allow the water to escape freely, after doing its proper work.

C is the case, in which the chutes c^1 are formed, through which the water passes to the wheel B.

The lower plate c^2 of the case C is so constructed with inclined, straight, or curved lines, as shown in fig. 1, so as to partially close the periphery of said case, and thereby lessen the space through which the gate will have to move, to regulate or prevent the ingress of water.

D is the gate, which is made in the form of a hollow cylinder or hoop, of such a size as to surround the case C, and of such a breadth, that when lowered, it will fully close the chutes c^1.

To the upper edge of the gate D are attached the outer ends of three or more radial arms, E, the inner ends of which are securely attached to a ring-collar, F, which fits and works upon a tube, G, formed upon or attached to the crown-plate of the case C, and through which the shaft A passes.

The arms E rest upon inclines H, attached to the top or crown-plate of the case C, so that as the hoop-gate D is moved in one direction, it will be raised or opened, and when moved in the other direction, it will be lowered or closed.

To the arms E of the gate D is attached a spiral or upwardly-inclined rack, I, into the teeth of which mesh the teeth of the pinion-wheel J, the lower end of the shaft of which is pivoted to some suitable support, attached to the case C, so that by revolving the pinion J, the gate may be opened or closed.

The upper end of the tube G should be provided with a water-tight cap or stuffing-box, K, through which the shaft A may pass.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The case C, with its lower plate c^2, that forms the bottom of the chutes c^1, inclined upward and outward, to partially close the periphery of said case, substantially as herein shown and described, and for the purpose set forth.

2. The hoop-gate D E F, substantially as herein shown and described, in combination with the case C, c^1 c^2, and tube G, as and for the purpose set forth.

3. The combination of the inclines H, case C, arms E, gate D, and shafts A G, when arranged substantially as shown and described.

4. The spiral rack I and pinion-wheel J, in combination with the hoop-gates D E F and case C c^1 c^2, substantially as herein shown and described, and for the purpose set forth.

5. The wheel B, consisting of a concavo-convex top, on which are formed the buckets b^1, connected at the bottom by the strengthening-ring b^2, and having the form described, whereby to obtain the full effect, and, at the same time, allow the free escape of the water, as set forth.

Witnesses:
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