

S. L. DENNEY & W. MERCER.

Casings and Gates for Turbine Water-Wheel.

No. 132,358.

Patented Oct. 22, 1872.

Fig 1.

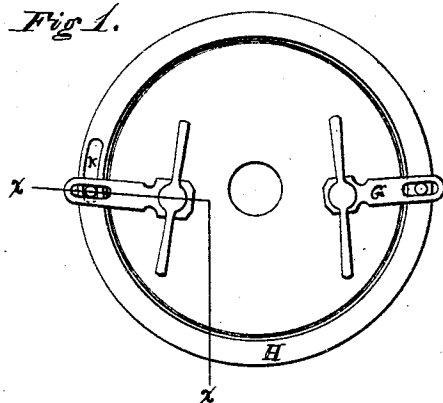


Fig 2.

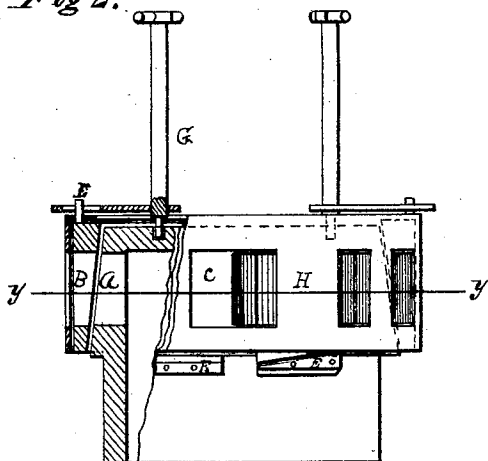
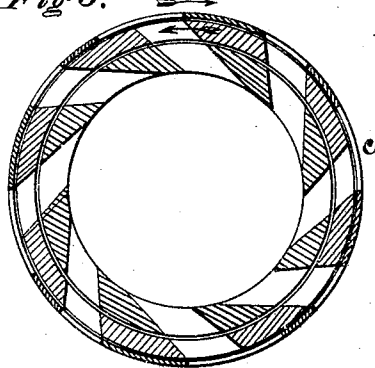


Fig 3.



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IMPROVEMENT IN CASINGS AND GATES FOR TURBINE WATER-WHEELS.

Specification forming part of Letters Patent No. 132,358, dated October 22, 1872.

To all whom it may concern:

Be it known that I, SAMUEL L. DENNEY, of Gap, Lancaster county, and WILLIAM MERCER, of Christiana, Lancaster county, Pennsylvania, have invented certain Improvements in the Casing and Gates for Turbine Water-Wheels, of which the following is a specification:

The first part of our invention relates to the tapered form given to the outer surface of the wheel-casing *a* and the corresponding shape of the inner surface of the gate-ring *B*, whereby we secure a close-fitting gate, which will effectually prevent the wasting of the water while the wheel is standing. The second part of our invention relates to the combination of the gate-ring *B* with the gate-ring *C*, whereby we can close a portion of the gates at regular intervals around the wheel, while the remaining gates are left open to their full extent.

Figure 1 is a top view; Fig. 2 is an elevation; and Fig. 3, a horizontal section.

a is the casing which surrounds the wheel, and which is provided with gates corresponding with the buckets in the wheel. The outer surface of the casing *a* is turned with a slight taper. The inner surface of the gate-ring *B* is fitted to a corresponding shape, which, when put together, forms a joint which will not leak from usage, but will continue to wear and remain tight. To the casing *a* are secured the incline-ways *E E*, and, also, to the gate-ring similar ways are secured. The gate being revolved to the left until it is arrested by the stop *F* on the casing *a*, the apertures will be closed against the admission of the water to the wheel; then, by the reverse movement of the shifting device *G*, the gate-ring is revolved, and, at the same time, raised just sufficiently to free it from the casing of the contact of the inclined ways *E E*, thus facilitating its free and easy movement in opening and closing the gate.

It will be readily seen that a gate-ring constructed with this tapered form and not provided with the means for raising it simultaneously with its rotating movement, the corroding of the metal surfaces would cause the gate to adhere so firmly to the casing as to render the working of the gate impracticable,

and thereby destroy the advantages hereby secured in a perfectly-fitting and easily-operated gate.

H is a secondary gate-ring fitting over gate *B* with sufficient freedom of action to allow it to be readily operated by the rotating device *C*. The apertures *c c c* in this gate are enlarged lengthwise, so that only every other aperture in gate *B* is closed by shifting the gate *H* in the direction indicated by the arrow. The slot *K* and pin *L* regulate the distance which gate *H* is required to move to regulate the supply of water to the wheel through gate *B*.

When the full power of the wheel is not required to perform the immediate work, water is saved and power gained by closing a portion of the apertures in the casing and allowing a full flow of water through the others over that of partially closing all of the apertures and admitting only a partial flow through each and all of the apertures; and to effect this closing of the apertures and shutting off the flow of water from every other aperture when the wheel is running, it is only necessary to shift the gate *H* by means of the device *G* until the opposite end of the slot *K* is brought against pin *L*, when the apertures will be closed. By reversing the gate the apertures will all be opened through gate *B* to the wheel.

It is not necessary to fit the secondary gate *H* with that degree of accuracy that gate *B* is fitted, as it serves only as a regulator while the wheel is running; consequently, the surfaces may be straight or tapered, as experience may determine.

We claim as our invention—

1. The combination of the wheel-casing *a*, gate-ring *B*, and inclined ways *E E E E*, substantially as and for the purpose hereinbefore set forth.

2. The combination with the wheel-casing *a*, gate-ring *B*, inclined ways *E E E E*, and secondary gate-ring *H*, substantially as and for the purpose hereinbefore set forth.

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Witnesses:

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