

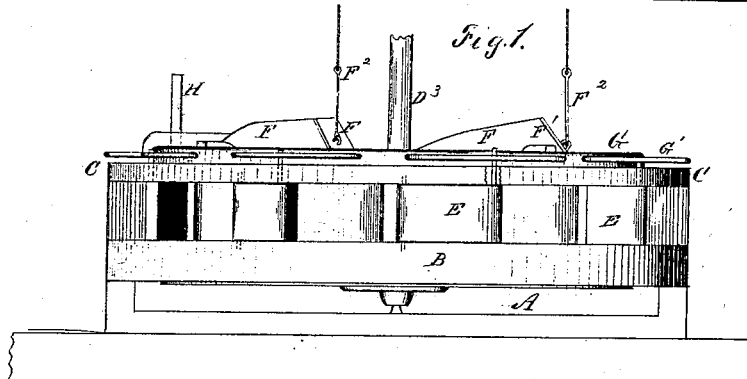
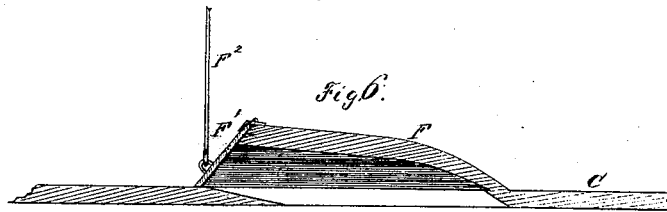
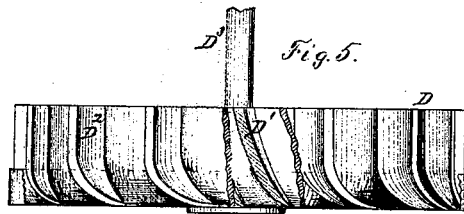
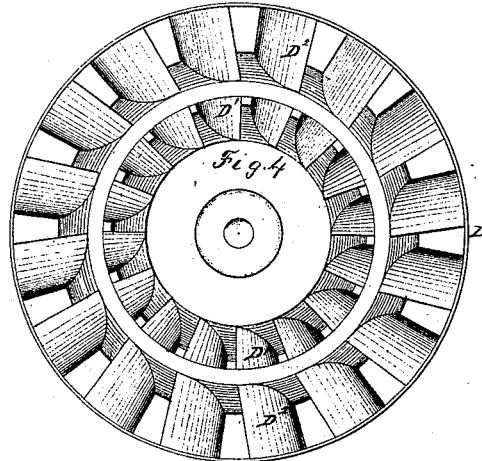
G. W. Wernitz,

2. Sheets, Sheet 1.

Water Wheel.

No. 109,784.

Patented Nov. 29, 1870.



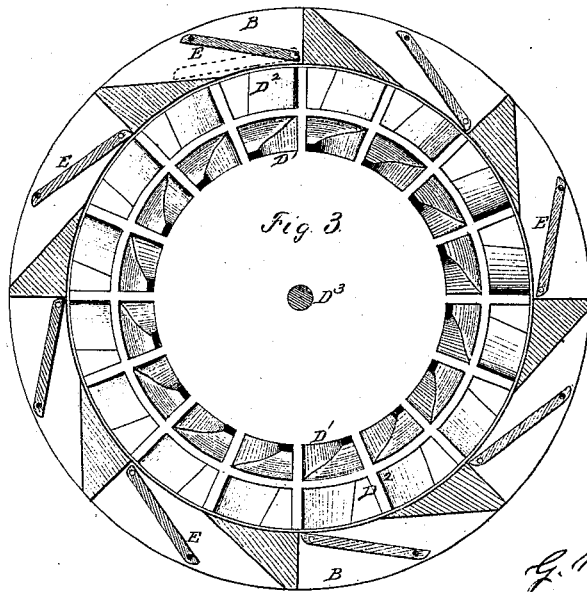
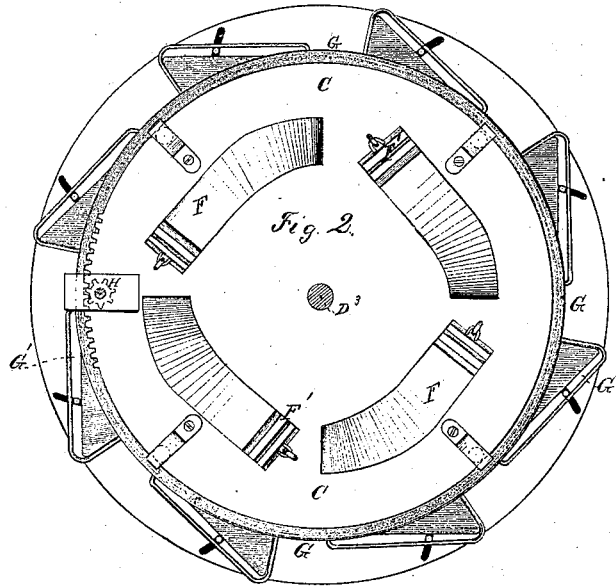
G. W. Merutz,

2. Sheets, Sheet, 2.

Water Wheel.

No. 109,784.

Patented Nov. 29. 1870.



Witnesses
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United States Patent Office.

GEORGE W. WERTZ, OF AUBURN INDIANA, ASSIGNOR TO HIMSELF AND
HENRY A. SHULL, OF SAME PLACE.

Letters Patent No. 109,784, dated November 29, 1870.

IMPROVEMENT IN 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, GEORGE W. WERTZ, of Auburn, in the county of De Kalb and in the State of Indiana, have invented new and useful Improvements in Water-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is an elevation of my improved wheel, showing the bridge-tree upon which it rests; the ring which surrounds it; the gates around its outer surface, together with the means of operating them; the cap or cover of the wheel; the induction-apertures through such cap, and the gates which control such apertures.

Figure 2 is a plan view, showing the cap or cover; the partially-rotating ring, with its angular slots for opening the side gates; the mechanism for moving the same; the raised projections upon the cap, through which water passes to interior buckets of the wheel, and the gates for regulating the flow of such water.

Figure 3 is a plan view of the wheel, the ring which surrounds it, and the gates which control the flow of water to the outer set of buckets.

Figure 4 is a plan view of the wheel, showing the arrangement of the two sets of buckets and the rim which divides them.

Figure 5 is an elevation of the wheel or portion of its outside rim, broken away to show the construction of the outer set of buckets.

Figure 6 is an elevation of one of the projections formed upon the cap of the wheel, showing the passage for the water to the interior buckets.

Corresponding letters refer to corresponding parts in the several figures.

This invention relates to water-wheels; and

It consists in the construction, combination, and arrangement of some of its parts, as will be more fully explained hereinafter.

A in the drawing refers to a bridge-tree or to the foundation upon which the wheel rests, it being provided with a suitable stop or bearing for the support of the lower end of the shaft of the wheel.

B refers to a ring which is to rest upon the bottom of the flume in which the wheel is placed. The interior diameter of this ring is to be such that the wheel will revolve freely within it, while its width is to be sufficient to leave a surface sufficiently broad to permit the gates which control the flow of water to the outer set of buckets to move upon it.

C refers to a plate, which I prefer to make of metal, but which may be made of wood. It is to be of sufficient thickness to sustain the pressure of water which rests upon its upper surface, and of a diameter equal, or about equal, to the outer diameter of the ring B.

Upon the under surface of this plate there is a

series of projections formed, the depth of which is equal to the desired space to be left between the plate and the ring, which space will depend upon the depth of the wheel, or, in other words, upon the length of the buckets of the wheel.

The lower surface of these projections rests upon the upper surface of the ring B, and bolts pass down through both for the purpose of securing them in their positions.

This plate covers the entire upper surface of the wheel, except that there is an aperture through it, at its center, just large enough to permit the shaft D³ of the wheel to pass up through.

D refers to the wheel which has two sets of buckets, the interior ones, D¹, of which are formed upon the outer surface of the hub of the wheel, it being made large for that purpose, while between them and the outer set, D², there is a rim of metal, which is as wide as the buckets are long. This rim is curved inward at its lower edge, so as to give a greater width to the buckets at their lower ends than they have at their upper ones; and in order that the inner buckets may possess the same advantage, the outer surface of the hub of the wheel is curved or rounded upon its lower side, so as to provide for the increased width of such buckets at their lower ends. This feature of the construction of the wheel is shown at fig. 4, its object being to allow additional room at that point for the discharge of the water from the wheel after it has acted by impact upon such wheel, and thus, as quickly as possible, to relieve it from the weight of water which it would otherwise have to carry.

E E refer to a series of gates, which are pivoted to the ring B at their lower sides, their width being such as to cause them to move water-tight between said ring and the cap or cover C, to which their upper sides are pivoted. The pivoted points of these buckets are at their inner end, and there rise from their upper surfaces, at their opposite ends, studs or pins, which pass up through tangential slots formed in the cap C, as shown in fig. 2, and engage or pass into slots formed in a partially-rotating ring, soon to be described.

F F refer to a series of projections which is formed upon the upper surface of the cap or cover C, as shown in fig. 2. There are passages through these projections, as shown at fig. 6, for the purpose of allowing water to pass to the inner set of buckets at any time when it is desirable to give an additional amount of power to the wheel, or, in other words, when the water acting upon the outer series fails to give the required amount of power.

F' F' refer to gates which control the amount of water which is allowed to flow through the apertures above alluded to, they being hinged to the upper surfaces of the projections F F, and provided with a rope

or chain for opening them, which may be passed over a pulley or screw placed in any convenient position, and from thence to a windlass, which will afford the means for readily operating the gates.

G refers to a ring of metal, which is placed upon the upper surface of the plate O and held in position by suitable brackets attached to said plate, the outer ends of said buckets being provided with friction-rollers which bear upon the interior surface of said ring, and thus relieve it of much of the friction which would otherwise be thrown upon it when the gates are being opened or closed. The construction of this ring is clearly shown at fig. 2, where it will be seen that upon its outer surface there is a series of projections equal in number to the number of gates to be acted upon, and that those projections are provided with slots which are tangential to the circumference of the ring, the object of which is that they shall open and close the outer gates as the ring is partially rotated, a portion of the interior surface thereof being provided with cogs which mesh into a pinion, H, placed

upon a shaft, H', the upper end of which is provided with a crank for giving the desired motion.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. The concentric series of buckets D¹ D², the lower ends of which are of greater width than are the upper ends, substantially as and for the purpose set forth.

2. The combination of the gates E E and F F', when so arranged with reference to each other that either set may be used separately, or that they may be used in conjunction, substantially as and for the purpose set forth.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. WERTZ.

Witnesses:

HENRY A. SHULL,
DAVID KRIDER.