F. KRING.

Water-Wheel.

No. 162,293. Patented April 20, 1875.

Fig. 1

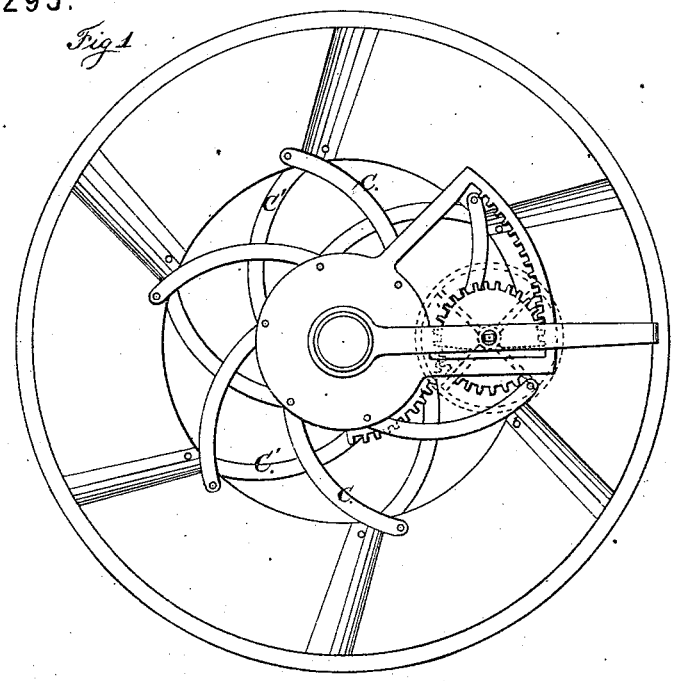
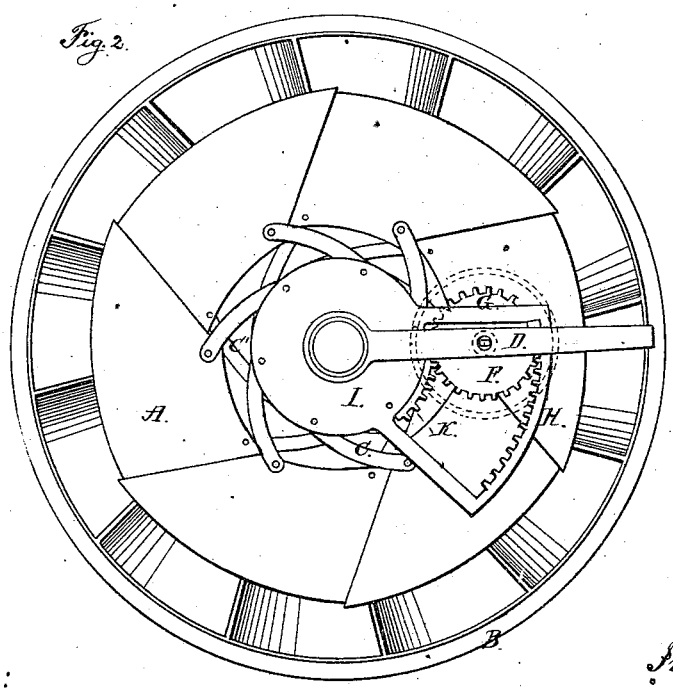


Fig. 2.



Witnesses:

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Inventor:

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By Daniel Breed Atty.

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UNITED STATES PATENT OFFICE.

FREDERICK KRING, OF JOHNSTOWN, PENNSYLVANIA.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **162,293**, dated April 20, 1875; application filed December 5, 1874.

To all whom it may concern:

Be it known that I, FREDERICK KRING, of Johnstown, Somerset county, Pennsylvania, have invented an Improvement in Water-Wheels, of which the following is a specification:

My invention consists of a novel construction and arrangement of the gates and water-ducts, in combination with a turbine water-wheel, as will be more fully set forth in the following description and claim.

In the accompanying drawings, Figure 1 is a top view of the water-wheel case with the gates closed, and Fig. 2 is the same view with the gates open.

In the construction of the water-wheel and case the wheel may be supported upon a step in the usual manner, and the lower part of the case may have perpendicular sides to fit the wheel. Above the wheel the rim of the case is made very flaring in order to give the water ducts or passages a downward and inward direction, so as to strike the face of the buckets at nearly a right angle, and thus bring the full force or momentum of the water upon the wheel. The inner wall of the water-ducts is perpendicular, while the thin plates between the ducts are both curved and twisted so as to gently turn the water in the proper direction to fall in with the motion of the wheel and descend in an unbroken current and volume until it leaves the wheel. The water being thus admitted with a uniform pressure on all sides of the wheel, the side pressure is prevented, and all consequent friction which might retard the speed and power of the water-wheel. The gates A rest horizontally upon the wheel-case, and the weight of the water insures a close joint without any expensive fitting or liability to get out of order by wear, which tends rather to close than open the joints. The ends of each gate overlap the two adjoining gates, and thus form sliding joints between them.

I regard this as the simplest, cheapest, and best construction of gates, and also very efficient and durable.

The gates are opened by sliding radially inward, so that the water is first admitted at the outer rim of the case B, and strikes the wheel with the greatest force belonging to the small amount of water thus used. The gates are opened and closed by means of a revolving standard or shaft, D, crowned by a hand-wheel, E, in the manner of a capstan, and also connected with the gates by means of segment-gears and radial arms, as follows: This shaft D is provided with two segment-gear wheels, F and G, the former of which gears into a curved segment-bar, H, and thus turns the revolving plate I, while the latter gears into the teeth of another revolving plate, K. These revolving plates are, in turn, connected to the gates by the two series of radial arms C and C′, which are set obliquely and also curved, so as to work freely in opening and closing the gates, as shown in Figs. 1 and 2.

My wheel-case is cast with a flange on the outside, and may be set in a hole cut in the bottom of the fore-bay. The case has an arch, forming the central part above the wheel, and the wheel itself is also cast with an arch over the center, so as to keep the wheel, except the buckets, entirely free of water.

Having described my invention, I claim—

The series of horizontal gates A, resting and sliding upon the wheel-case B, said gates overlapping each other, and being opened by moving radially inward, substantially in the manner and for the purposes set forth.

FREDERICK KRING.

Witnesses:

WILLIAM GERHARDT,

JACOB ZIMMERMAN.