

P. W. DAVIS & D. D. BUNNELL.

Improvement in Water-Wheel Gates.

No. 114,650.

Patented May 9, 1871.

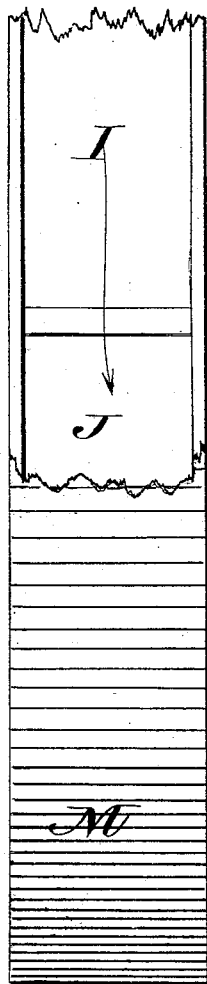


Fig. 1.

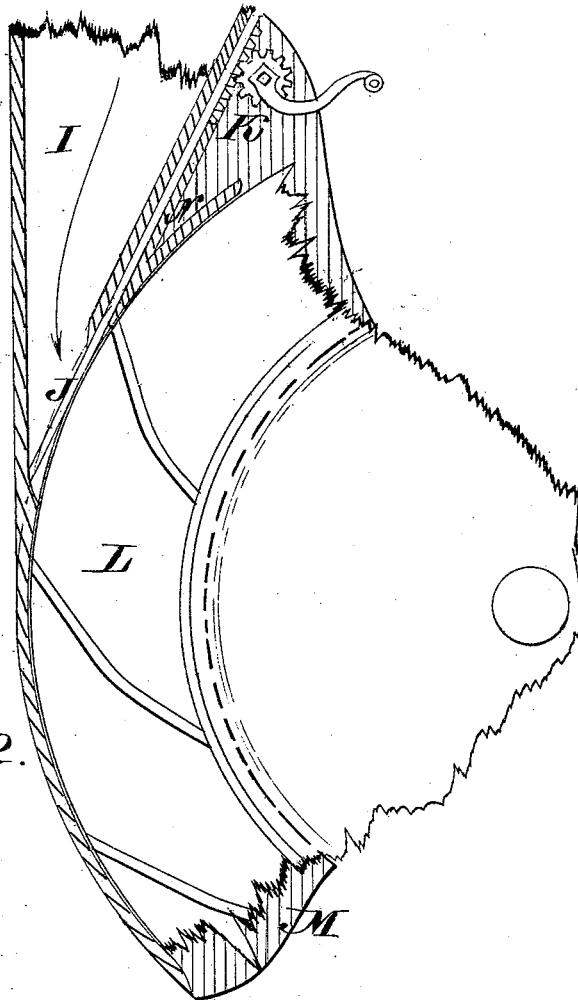


Fig. 2.

Witnesses:

*G. E. Gilbert
C. W. Skiffing*

Inventors:

*P. W. Davis
D. D. Bunnell*

United States Patent Office.

PERRY W. DAVIS AND DENNIS D. BUNNELL, OF PORTLAND, OREGON.

Letters Patent No. 114,650, dated May 9, 1871.

IMPROVEMENT IN WATER-WHEEL GATES.

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

We, PERRY W. DAVIS and DENNIS D. BUNNELL, of Portland, in the county of Multnomah, in the State of Oregon, have invented an Improved "Gate for Water-Wheels," of which the following is a specification.

The nature of our invention will be understood from a reference to the drawing, where—

Figure 1 is a front, and

Figure 2 a side view, both in section.

I is the inlet from the flume.

L, the wheel.

J, the "gate."

M, the jacket or "case" of a "breast-wheel."

K, a rack and pinion for opening and closing the gate.

J, the rack, being rigidly attached thereto.

N is an oblique angular piece between the gate and wheel. The side next the gate is straight and next the wheel curved to fit the same, and this forms the seat on which the gate J is moved by rack and pinion K.

The pieces M N are solid and continuous, M continuing over the front and sides of the wheel as far as the double curved line, seen on inside in fig. 2.

The upper outside part of same is formed into an inverted conical rectangular water-way leading inlet-water from flume.

On the inside of this inlet are formed ways in which the gate J traverses obliquely in connection with the part or piece N.

The reason for setting the gate J obliquely is that sand, dirt, and settlings do not fasten on the ways and seat N as they would in some other situations, and the least movement of the gate starts these deposits from the seat, and so is not liable to wear (as it would otherwise) out of joint.

Every time the gate is opened the water carries off the settlings on the edges, but not that which fills in the corners of the ways; but when the gate is pushed down too close it scrapes the deposits from the corners and pushes them down into the swift water in the narrow opening, and is thereby swept out each time clear of the seat, and so prevents the abrasion of the same by constant wear, being easily moved.

We do not present as our invention, broadly, the arrangement of a gate at an angle within the flume, and operating it by means of a rack and pinion, as illustrated in Shauplat's Atlas, Hydraulic Motors, Plates IV and XV. But we present certain points of difference, which, by a little careful observation, will be comprehended between the subjects of these illustrations and of our invention, resulting in an important advantage which the latter possesses.

In the first place we produce a turbine wheel with a flume, I, the outer and inner walls of which run tangentially, or nearly so, with reference to the scroll casing or pen-stock M, so that if the inner wall were continued past the opening it would cut the outer wall at its point of tangential contact with the scroll casing.

Instead of this a gate is provided to slide on ways in the direction of the inner wall, and on its back part a rack constructed, which is operated by a pinion, located away from the influence of the head of water, and secured from the deposit of dirt and obstacles contained in the same, the rack and pinion being placed at the inner end of the gate, which forms an obtuse angle with the contiguous wall of the flume. Consequently, when the gate is drawn back the opening commences at its outer end, where an acute angle is formed with the outer wall of the flume.

Now, it is clear that if the gate be closed in any wheel which has one angularly arranged, the dirt and other obstacles carried along by the water are lodged in the more remote, which is, in any case, the acute angle, formed by the gate and flume-wall. Hence it is necessary that the gate should open at that point, so that these obstacles may be removed whether the gate be partially or entirely opened, and at once, for, if permitted to remain, they gradually find their way into the crevices and among the gearing, and hinder perfect operation.

Finally, it will be seen that the inner wall of the flume forms a support to a considerable portion of the gate. The flume has a wide mouth and narrower opening to the wheel, while the greater pressure, resulting from the greater volume of water, is directed to the outer end of the gate, which is devoid of gearing.

Having fully described our invention, we do not claim, broadly, the arrangement of a gate for water-wheels at an angle within the flume, in combination with a rack and pinion; but

What we do claim as our invention, and desire to secure by Letters Patent, is—

The gate, arranged within the flume T, as described, so as to open at the acute angle formed by it and the wall of the flume, in combination with the rack and pinion located as described, and flume T, constructed substantially as and for the purpose specified.

P. W. DAVIS.
D. D. BUNNELL.

Witnesses:

G. E. GILBERT,
C. W. HIGGINS.