J. P. COLLINS.

Water-Wheel.

No. 163,850. Patented June 1, 1875.

Fig. 1.

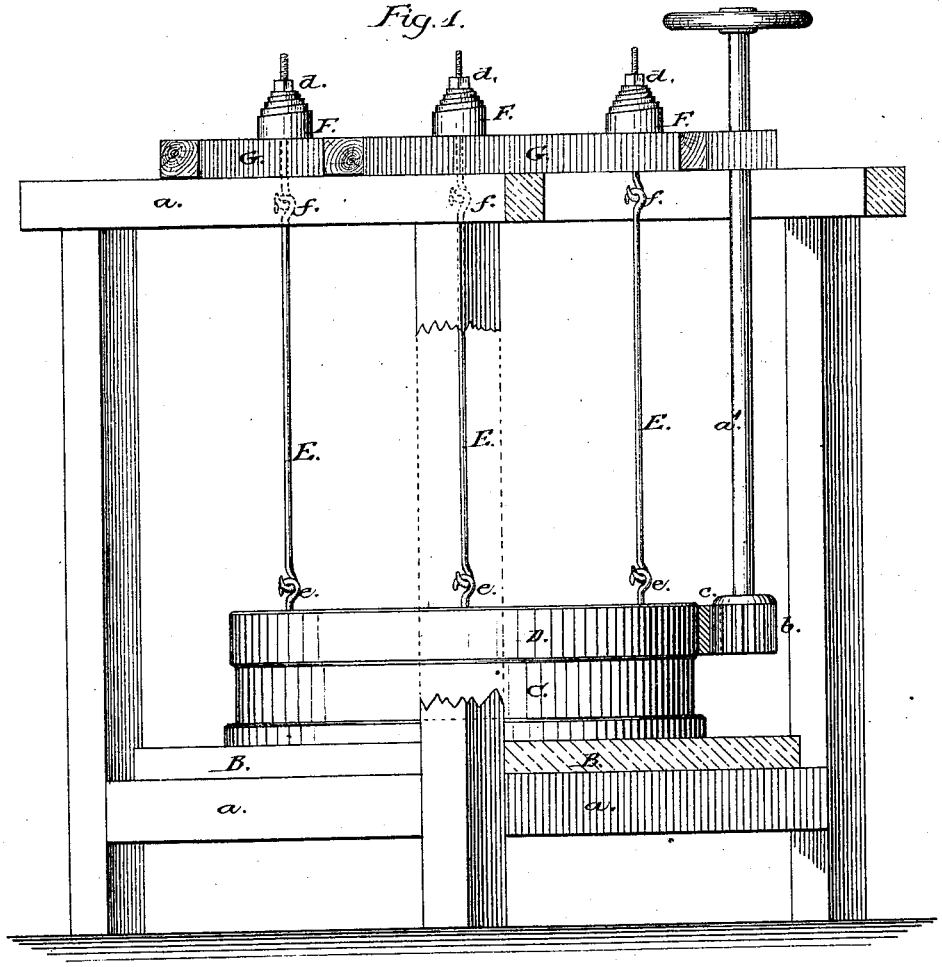
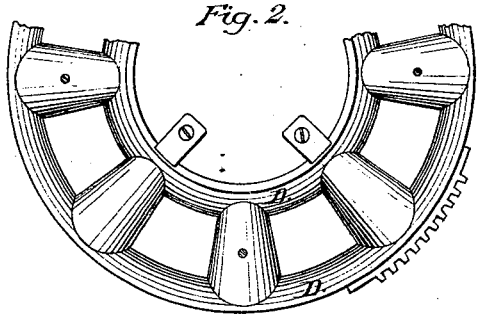


Fig. 2.



Witnesses:

D H Gould.

A H Harris

Inventor:

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UNITED STATES PATENT OFFICE.

JAMES P. COLLINS, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. **163,850**, dated June 1, 1875; application filed April 20, 1875.

To all whom it may concern:

Be it known that I, JAMES P. COLLINS, of Norwich, New London county, Connecticut, have invented certain new and useful Improvements in Water-Wheels, of which the following is a full, clear, and exact description, reference being had to the annexed drawing making a part in this specification, in which—

Figure 1 is an elevation, showing an ordinary flume or pen-stock, with the guide and gate resting upon the floor of the same, also the manner of suspending the gate according to my invention. Fig. 2 is a plan of part of the gate, showing the points of connection between the gate and suspending-rods.

Similar letters of reference indicate corresponding parts in each figure.

This invention relates to water-wheels of the turbine kind. Its object is to provide a means of diminishing the friction between the bearing-surfaces of the gate and guide of a turbine-wheel, and this object is accomplished by supplying to the sustaining-rods the tension required to counteract the injurious pressure of the water acting upon said gate, and at the same time allow the said bearing-surfaces to remain in such close contact as to substantially prevent leakage of water when the gate is closed.

The particular construction which I have shown for attaining this object will be best understood from the following description, with reference to the drawing, in which—

A represents the frame-work of a flume or pen-stock; B, the floor of same; C, a guide of a turbine-wheel; D, the gate controlling the quantity of water passing through the guide.

The gate is regulated by means of the rack *c* and pinion *b*, connected with the shaft *a'*. The gate is suspended by means of the rods E, which are jointed at *e* and *f*, and sustained by the springs F, which are supported by the timbers G G, and are adjusted by means of the nuts *d d*. In opening and closing the gate the lower extremities of the rods E E E would describe the arc of a circle similar to that described by a pendulum, if they were not provided with some elastic medium permitting them to be extended in the direction of their length, so that the movement of their extremities might be in a horizontal plane. As the tendency of the rods to describe an arc increases, the springs E E E, by yielding to the tension on the rods, permit the required extension in their length, and as this tension is relaxed the action of the springs in returning to their normal condition maintains the requisite tension of the rods as they again approach a vertical position. By this arrangement the gate is allowed to move in a horizontal plane for the whole distance through which it passes, without causing a vertical movement of said gate, as would necessarily be the case were the rods E E E rigidly fixed at the point of suspension. In performing their two offices the action of these springs E E E is positive and constant while the gate is in operation, and not merely intermittent.

I do not claim the application of these springs to any gate or series of gates which lift in a vertical direction, nor to any cylinder or sleeve gate moving in a horizontal direction, and admitting the water in a similar direction either toward the center or the circumference of the wheel. I distinctly limit my claim to that class known as register-gates, which admit the water to the wheel in a vertical direction, or at any angle thereto less than a right angle.

Having thus described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

In combination with a suspended water-wheel gate, having a bearing-surface in a horizontal plane, springs, applied substantially as and for the purpose set forth.

JAMES P. COLLINS.

Witnesses:

DAVID H. GOULD,

HENRY H. BURNHAM.