J. S. LADOW.

Water-Wheel Gates.

No. 204,050. Patented May 21, 1878.

FIG. 1.

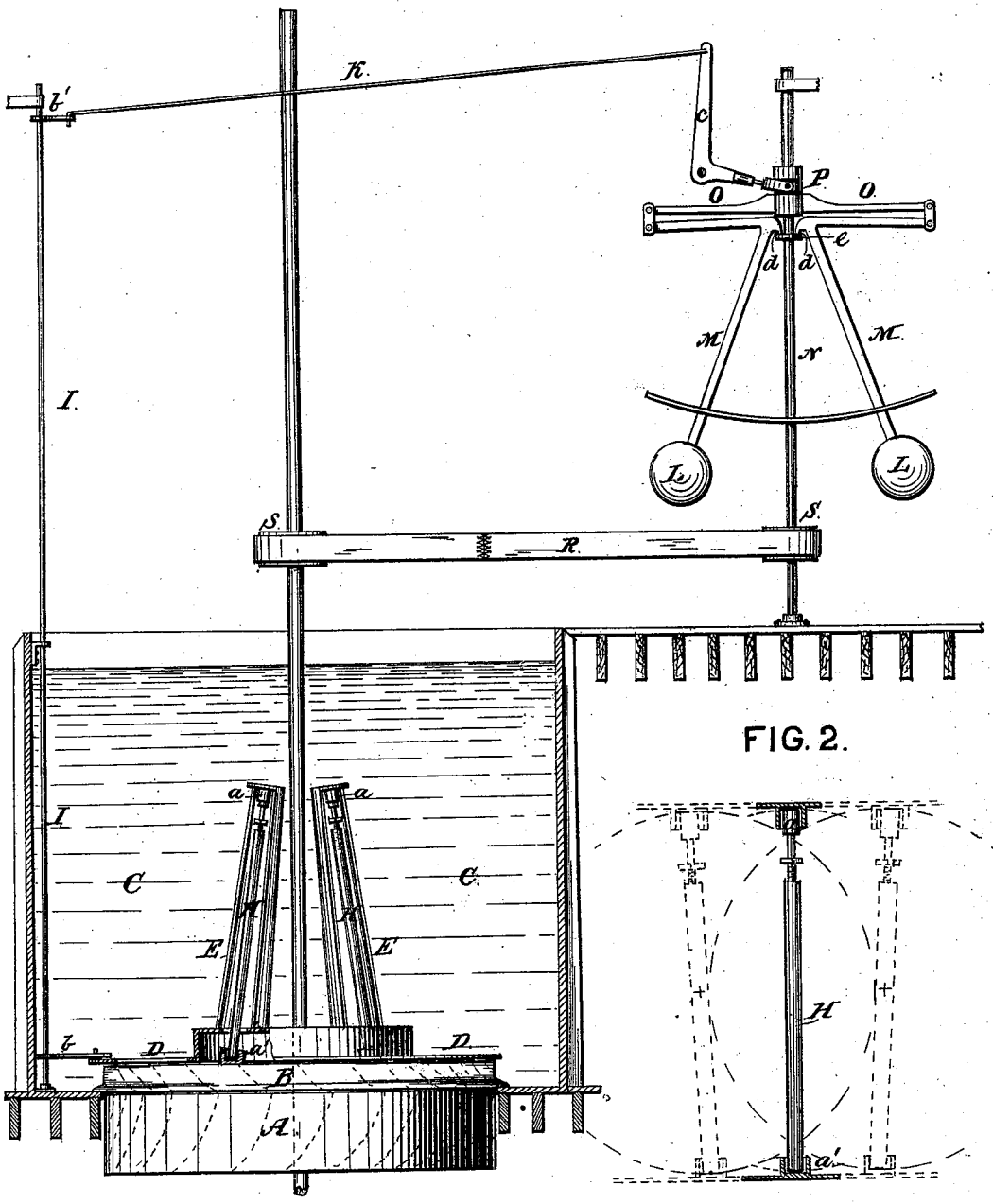

FIG. 2.

WITNESSES

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JACOB S. LADOW, OF MECHANICSVILLE, NEW YORK.

IMPROVEMENT IN WATER-WHEEL GATES.

Specification forming part of Letters Patent No. **204,050**, dated May 21, 1878; application filed September 4, 1877.

To all whom it may concern:

Be it known that I, JACOB S. LADOW, of Mechanicsville, Saratoga county, New York, have invented an Improvement in Water-Wheel Gates; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure I is a side view of my invention with a part broken away, showing a detail; and Fig. II is a detail view, showing the action of the standard.

My invention relates to that class of inventions which have for their object the regulation of the speed of machinery driven by water by operating the water-wheel gate by the action of a governor.

My invention consists, first, in hanging the gate of the water-wheel upon standards having segment ends, being the equivalent of a section of a pulley, as hereinafter described, and allowing the gate to move horizontally over the guide, yet not in contact, so that the diminished friction will allow the gate to be opened by a governor and the flow of the water to be regulated by the speed of the wheel; and it secondly consists in constructing the governor with stationary arms connected with the collar and angular ball-arms operating upon pivots at their elbow, by which the movement of the governor is increased in extent and the friction greatly lessened.

In the drawings, A represents the wheel, and B the guide, in the usual form of turbine water-wheels. The wheel is located in the flume C, into which the water is admitted by wickets, in the usual way. Over the guide B is the horizontal gate D, having a series of orifices near its periphery, to admit the water to the guide in the usual manner. Upon the raised portion of the gate D are stanchions E E, three or more in number, preferably made channeled, as shown, but may be made of any shape; or the chamber of the gate may be raised high enough for the stanchions to be placed under it. At the top of the stanchions are inverted sockets *a*, with bottoms consisting of a flat or plane surface. At the base of the stanchions E are orifices through the raised portion of the gate D, and in line with said orifices. Upon the top of the guide B is a similar socket, *a'*, facing the socket *a*, and having its bottom parallel with the bottom of the socket *a*. Into the sockets *a* and *a'* are placed the ends of the standards H, and as the socket *a'* is upon the guide and the socket *a* is in the top of the stanchion E, which is upon the gate, it is clear that the standards H will support the gate.

The standards H are made with segment ends—that is, the ends are concentric with a circle the center of which is the center of the standard, so that the standards are practically sections of pulleys the centers of which are the centers of the standards and the peripheries of which are the segment ends of the standards. The standards H are also provided with a male and female screw, by which they may be adjusted in length.

Pivoted at the side of the flume C is the rock-shaft I, having two arms, the arm *b* connected by a pin to the side of the gate D, and the arm *b'* connected by a link, K, to a toggle-lever, *c*, which is connected to the collar of the governor, and by which, or other equivalent means, the action of the governor actuates the gate D in opening and closing it.

L L in the drawings are the balls of a governor attached to toggle-arms M. The arms M bear upon pivots *d*, which work in a female center in each side of a collar, *e*, upon the main shaft N of the governor. The outer ends of the toggle-arms M are linked to the outer ends of the cross-bars O, which are attached to the sliding collar P. The toggle-lever *c* is attached to the sliding collar P in the usual manner, and the governor has the guard to regulate the movement of the balls similar to other governors.

The operation of my water-wheel and governor is as follows: The segment ends of the standards H are placed in the sockets *a* and *a'* and the adjusting-screw in each standard turned until the gate D is raised above the guide B just enough to clear it; then, as the governor is attached to the gate by the connections *b*, I, *b'*, K, and *c*, water may be let on the gate by a wicket. As the wheel revolves it revolves the shaft of the governor by means of a belt, R, and pulleys S S. As the centrifugal force of the revolution of the governor raises the balls L the collar P is raised, and

this motion is communicated to the gate by the several connections above described, and the gate, being hung clear of the guide, is easily turned by the power of the governor and the water proportionally stopped off as the balls are thrown out, and vice versa.

As the standards H have rounded ends and act upon the flat bottoms of the sockets *a*, the movement of the gate D must be by greatly lessened friction; and as the gate moves the rounded ends roll over the bottom of the sockets as a segment of a pulley, and as the movement never exceeds the diameter of the standard, the gate must move along in a horizontal direction parallel to the top of the guide.

In Fig. II is shown an illustration in dotted lines of the principle of the horizontal motion allowed by the standards with segment ends rolling over the plane bottoms of the sockets as a section of a pulley. It can plainly be seen that if the side movement in either direction is not more than the diameter of the end of the standard the standard acts as a portion of a pulley, and the parallelism of the two surfaces is preserved.

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

1. The gate of a water-wheel hung to move with a horizontal motion, as described, in combination with an actuating-governor, as set forth.

2. The gate of a water-wheel suspended upon standards having segmental ends bearing against plane surfaces, substantially as and for the purpose described.

3. The gate of a water-wheel suspended by means of stanchions E, standards H, having segmental ends, and sockets *a* and *a'*, substantially as described.

4. The water-wheel gate suspended on standards, as described, and connected to a governor by means of the rock-shaft I, having arms *b b'*, link K, and toggle-lever *c*, substantially as described.

The above specification of my said invention signed and witnessed at Mechanicsville this 1st day of September, A. D. 1877.

JACOB S. LADOW.

Witnesses:
J. F. TERRY,
JOHN G. VANZANDT.