A. WOODWORTH.

Water-Wheel Governor.

No. 161,084. Patented March 23, 1875.

Fig. 1.

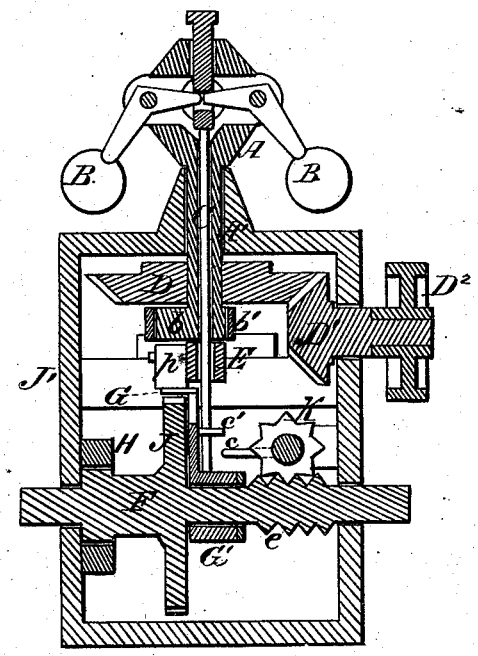
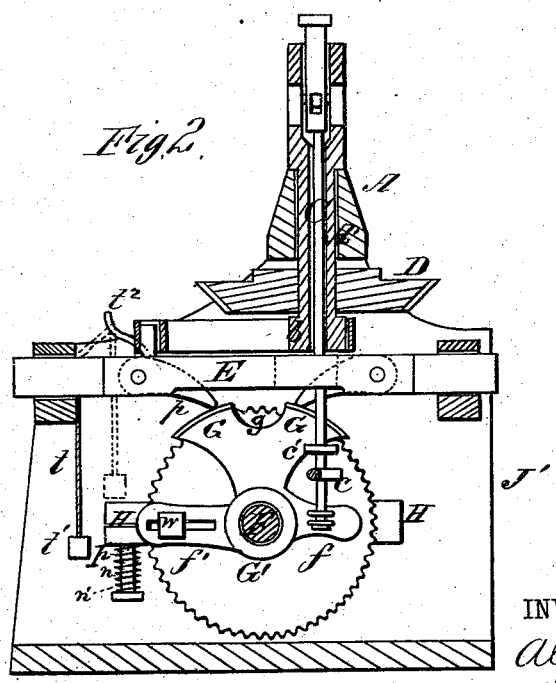


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

ALFRED WOODWORTH, OF CAMBRIDGE, NEW YORK.

IMPROVEMENT IN WATER-WHEEL GOVERNORS.

Specification forming part of Letters Patent No. **161,084**, dated March 23, 1875; application filed September 12, 1874.

To all whom it may concern:

Be it known that I, ALFRED WOODWORTH, of Cambridge, in the county of Washington and State of New York, have invented a new and valuable Improvement in Water-Wheel Governors; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a vertical sectional view of my water-wheel governor. Fig. 2 is a vertical sectional view of the same.

My invention relates to mechanism which is designed for actuating the gates of water-ways leading to water-wheels, and automatically regulating the speed of such wheels; and it consists in certain novel devices combined with a centrifugal governor for actuating guard-plate, so as to throw out of and into gear two pawls, which communicate motion to a ratchet-wheel on a shaft that works the water-wheel gate, as will be hereinafter explained.

The following is a description of my improvement:

In the annexed drawings, A designates the head of a centrifugal governor, and B B are the balls thereof, the arms of which balls enter a recess in the upper part of a vertically-movable rod, C. This rod C plays freely through the center of the governor-spindle A′, and is connected at its lower end to an arm, *f*, on one side of a hub, G′, which plays loosely on a shaft, F. The rod C has a collar, *c′*, fixed on it near its lower end, which, at certain times, hereinafter explained, will be struck by a tappet, *c*, on the shaft of a wheel, K, thereby depressing rod C, and lifting the governor-balls. Wheel K is rotated at a slow speed by a worm, *e*, on shaft F. Shaft F is supported by suitable bearings in a frame, J′, and it communicates motion to the water-wheel gate by means of bevel-wheels. (Not shown in the drawings.) On this shaft a large ratchet-wheel, J, is keyed, with which one or the other of two pawls, *p*, will engage at certain times. These pawls are pivoted to a slide, E, which receives its motion from an eccentric, *b*, on the governor-spindle A′. The pawls *p* are arranged so that one turns wheel J in one direction, and the other will turn this wheel in an opposite direction. G G designate two arc-shaped shields, which are separated by a short space, *g*, that allows one or the other of the pawls *p* to engage with the wheel J. These shields play over the periphery of wheel J, and are formed on the hub G′, on which hub is also formed an arm, *f′*, which has a weight, *w*, adjustably applied to it for balancing the governor-balls and their stem C. D designates a bevel-wheel on the governor-spindle A′, and D^1 is a bevel-pinion on the shaft of a belt-wheel, D^2, which wheel receives motion from the mechanism actuated by the water-wheel. H designates a friction-clamp, which consists of two parts, shaped to embrace the shaft F, and held together by means of a pin, *n*, and a spring, *n′*. By means of a nut on the pin *n* the clamp can be adjusted and made to bind with more or less force on shaft F. This clamp is designed to balance the gate, so that it will be steadily moved by the governor.

It will be seen, from the above description, that the two guard-plates G G receive a vibratory motion by the rise and descent of the governor-balls, and that when these plates are in the position indicated in Fig. 2 both pawls *p p* will be held free from the ratchet-wheel J. If the speed is too great, the governor-balls will rise and move the guard-plates, so that one of the pawls *p* will engage with wheel J, and partially close the gate. If the speed is too slow, the governor-balls will descend and cause one of the pawls *p* to open the gate. When the gate is open on account of low water or slow speed, the pin *c* on wheel K will strike the collar *c′* on rod C, and cause the governor-balls to move both shields G G beneath their pawls *p p*, thus preventing any derangement or breaking of the parts. If a rope, *t*, carrying a weight, t^1, be thrown over an arm, t^2, on pawl *p*, it will hold this pawl up, and prevent its engagement with the wheel J.

I am well aware that to give an oscillatory motion to a disk, for the purpose of allowing pawls to be engaged with or disengaged from a ratchet-wheel connected with the mechanism of a gate of a water-way, by the rise and fall of a shaft actuated by the descent and rise

of the governor-balls, is not new in water-wheel governors when the connection between the disk and rod is secured through a number of jointed rods and levers; hence I do not claim this invention, broadly.

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

1. The worm-shaft F and wheel K, carrying the tappet *c*, in combination with the vertically-movable rod C, having the collar *c'*, substantially as and for the purpose described.

2. The combination of the reciprocating slide E, having gravitating-pawls *p*, actuated by an eccentric, *b*, on the governor-spindle A', with the ratchet-wheel J, the oscillating shield G, vertically-movable rod C attached thereto, and provided with collar *c'*, and wheel K, having tappet *c*, substantially as described.

3. The sectional clamp H, embracing the shaft F of the ratchet-wheel J, connected by means of the pin *p*, and adjusted to gripe with greater or less force the said shaft by means of a spring, *n'*, and a nut upon the end of the said pin, for the purpose of balancing the gate, so that it will be steadily moved by the governor, as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ALFRED WOODWORTH.

Witnesses:
B. P. CROCKER,
C. E. SMITH.