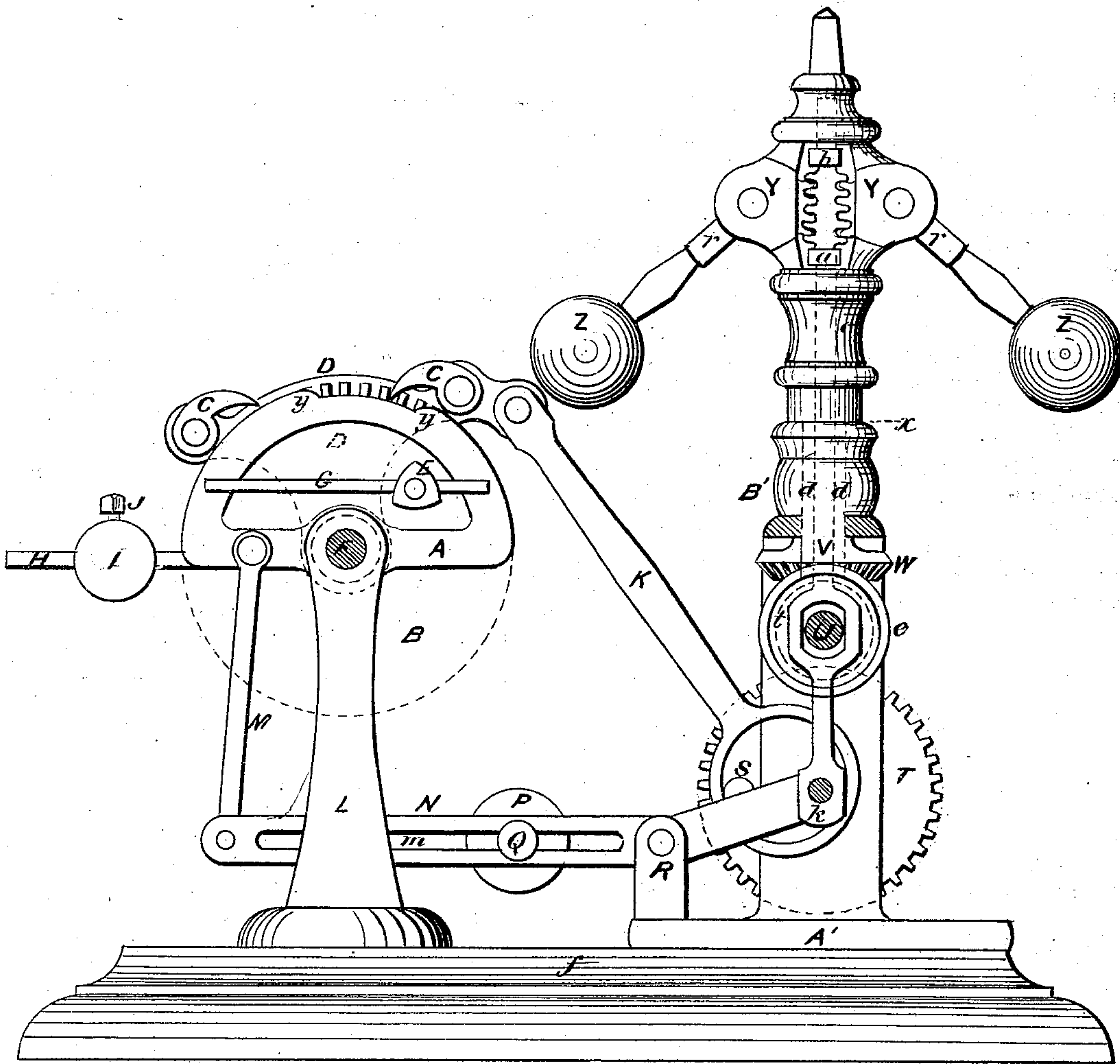


**E. ADAMS.
Governors.**

No. 152,938.

Patented July 14, 1874.



Witnesses

*Orin D. Adams
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UNITED STATES PATENT OFFICE.

ENOS ADAMS, OF BENNINGTON, VERMONT.

IMPROVEMENT IN GOVERNORS.

Specification forming part of Letters Patent No. **152,938**, dated July 14, 1874; application filed January 17, 1874.

To all whom it may concern :

Be it known that I, ENOS ADAMS, of Bennington, Vermont, have invented an Improved Governor, of which the following is a specification :

This invention is an improvement upon the governors heretofore patented to Hervey D. Snow, and known in the market as "Snow's Water-Wheel Governors;" and the nature of the invention consists in attaching to the semicircular disk by means of which the operation of the pawls which act upon the ratchet-wheel attached to or connected with the gate-hoisting apparatus in said Snow's governors, a device for controlling or regulating the speed at which it is desired to run the wheel or other motor with which the governor is connected.

In the accompanying drawing I have shown a side elevation of such working parts of a governor as are designed to be controlled by the operation of my devices.

In the drawing, *f* is a stand or base upon which the mechanism rests. Upon this base rests the arched standard *B'*, the top of which is shown at the line *x*, and upon and within which the governor proper and the mechanism by which it is operated are located and attached. All the working parts of this governor and the apparatus connected with it for hoisting and lowering the gate are substantially the same as those heretofore constructed, sold, and known as Snow's water-wheel governors.

Governors of this description are usually constructed and geared to run at a rate of speed restricted within certain limits, and all the parts are adjusted so that this range of speed cannot be deviated from without changing the construction of some of the working parts. By the use of my new mechanism, if, for instance, a governor is adjusted to regulate running at a speed of one hundred and forty revolutions per minute, and it admits of running up to one hundred and sixty and still govern, I can change and vary the running speed of the governor within these limits by placing the weight *E* at any desired point on the bar *G*, as may be found necessary, so as to accomplish just the result desired without alteration or substitution of any of the

working parts of the machine. Motion is communicated to the governor-head *Y Y* by means of the shaft *U*. Upon this shaft is a bevel-gear, *e*, meshing into and driving the gear *W*, which is attached to the sleeve *d* of the rotary standard *c*. Within this sleeve a sliding rod or spindle, *V*, works vertically, provided with a rack, *n*, at its upper end. This rack is constricted to revolve with the head about the spindle *V*, which is forced up or down by the action of the teeth upon the segmental ends of the arms *r r*, which carry the balls *Z Z*. As the centrifugal force throws out the balls when running, the rod *V* is depressed, and when the balls are depressed the rod is raised. The lower end of the rod *V* is pivoted at *k* to the end of the short arm of the lever *N*, working on the fulcrum *R*. The opposite end of this lever is connected with the disk *A* by the connecting-rod *M*. The periphery of the disk *A* coincides with or projects a little above the ends of the teeth of the ratchet-wheel *B*, except a portion thereof between the points *y y*, which is cut away so that when the disk is rotated either to the right or left of its position when the governor is running at the required speed, one or the other of the pawls *C C* will engage the ratchet-wheel *B*, thereby causing the same to be rotated until the normal rate of speed is re-established. The space between the points *y y* is so arranged with reference to the action of the pawls *C C* upon the ratchet-wheel *B* that when the governor is running at regular speed the pawls work upon the outer periphery of the disk and do not engage the teeth of the ratchet at all. The disk *A* has a partial rotation about the shaft *F*, which shaft communicates to or with the gate-hoisting apparatus. Upon this shaft and firmly attached to the same is the ratchet-wheel *B*, and on the back side of the ratchet-wheel, or opposite to the disk *A*, pivoted upon the shaft *F*, is the oscillating pawl-carrier *D*. To this pawl-carrier *D* are attached the pawls *C C*. A reciprocating motion is communicated to the pawls by means of the pitman *K*, one end of which is attached to a projection on the end of the pawl-carrier and the other end to a crank or eccentric on the shaft upon which the spur-gear *T* revolves. The gear *T* is actuated by a

pinion-gear, *t*, on the driving-shaft U. G is a bar spanning the disk A just above its axis, upon which is a sliding weight, E, which may be set at any point upon the bar above or on either side of the center of the disk. H is a projecting arm of the disk A, upon which a weight, I, is placed, which may be set at any point on the arm and held in place by the set-screw J. Another similar arm and weight may be attached to the opposite side to attain a contrary result. The lever N is constructed with a longitudinal slot extending from the fulcrum R outwardly nearly to the extremity of the long arm. A weight, P, may be attached at any point along this slot by means of the clamp-screw Q. The functions of the weights I and P, attached in the manner described, are to counteract the downward movement of the spindle V, occasioned by the centrifugal movement of the balls Z Z when the governor is running. These two weights, applied in the manner shown, can exert a force in but one direction, and that is in opposition to the upward movement of the balls when there is an acceleration of speed. The sliding weight E on the bar G may perform a double function. It can be set on the outer or left-hand side of the shaft F, when it will operate to accomplish the same results as either or both of the weights I and P. When adjusted precisely over the shaft F it exerts no controlling influence upon the movements of the balls of the governor; but when set on the

inner or right-hand side of the center, it acts to assist an upward or increased centrifugal movement of the balls and consequently of the water-wheel.

It is frequently desirable to obtain an increased or diminished rate of speed in operating machinery, without being obliged to resort to a change of belt-pulleys or driving-gear connected with or constituting a part of the mechanism of the governor, and without stopping the wheel. This is readily accomplished by the adjustment of the weight E on the bar G.

I am aware that weights have heretofore been attached to levers pivoted at one end to throttle-valve stems of steam-governors so arranged that the amount of resistance to be overcome by the governor to establish uniformity of action could be regulated by moving the weight nearer to or farther from the fulcrum; but in all such devices the action of the weight has been in one direction only and that opposite to the upward or accelerated movement of the governor-balls.

I claim—

The bar G and weight E, attached to the disk A, in combination with the reciprocating arm D, pawls C C, and lever N, as described.

ENOS ADAMS.

Witnesses:

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