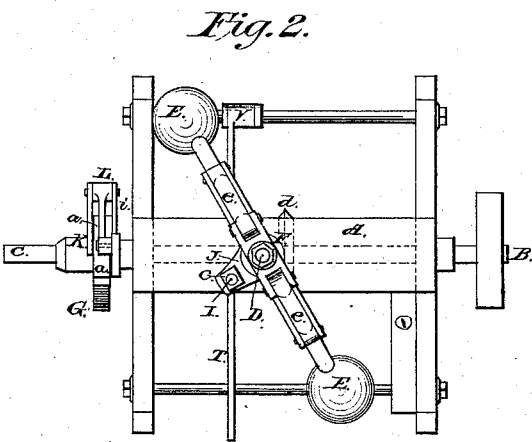
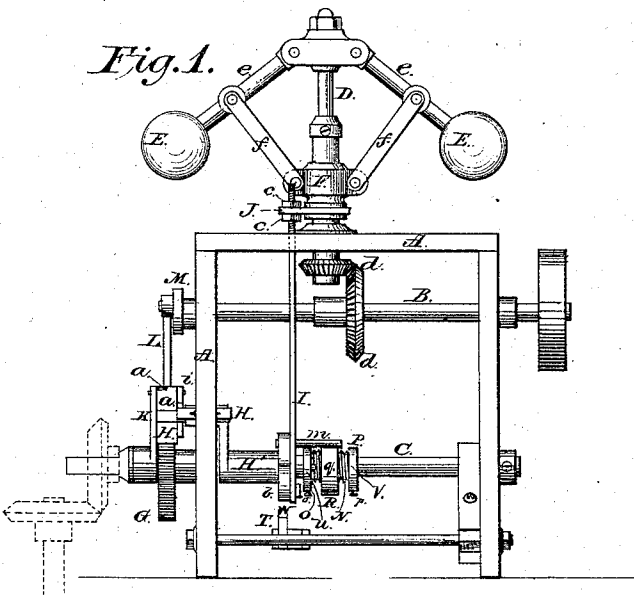


E. WRIGHT.
Water-Wheel Governors.

No.156,867.

Patented Nov. 17, 1874.



Attest:

Chas. H. Durlug
Geo. J. Henry

Inventor:

Edward Wright

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Fig. 3.

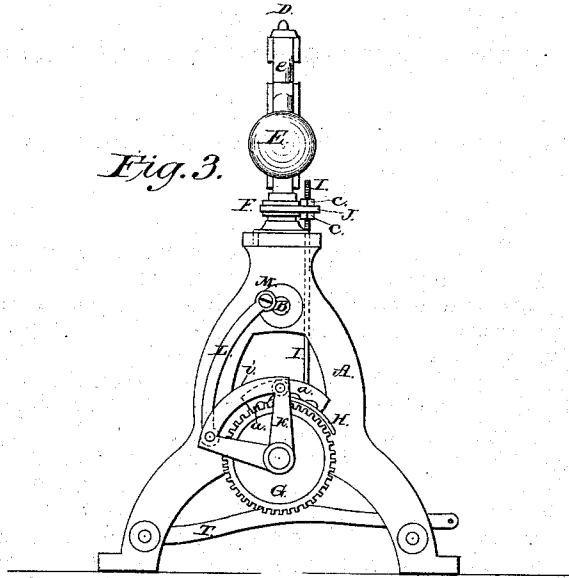


Fig. 4.

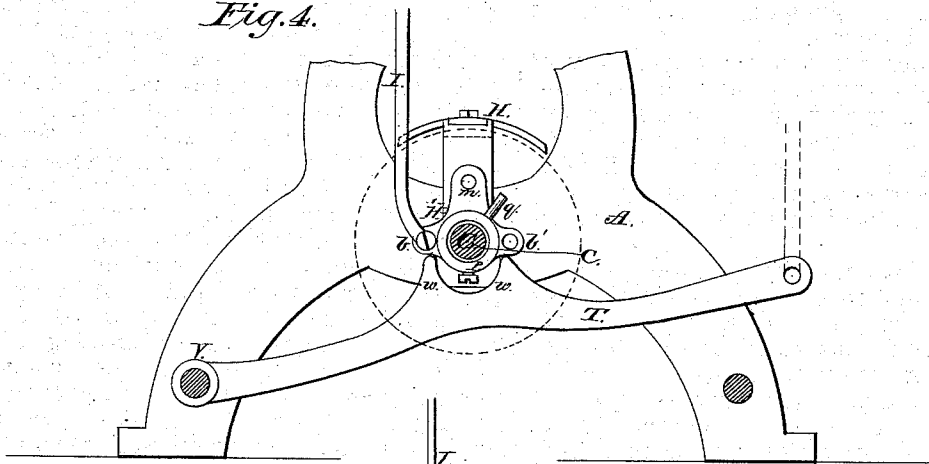
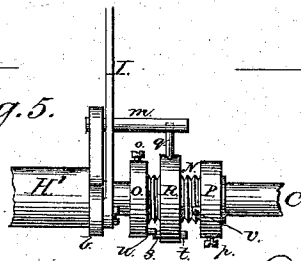


Fig. 5.



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IMPROVEMENT IN WATER-WHEEL GOVERNORS.

Specification forming part of Letters Patent No. **156,867**, dated November 17, 1874; application filed July 31, 1874.

To all whom it may concern :

Be it known that I, EDWARD WRIGHT, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Water-Wheel Governors; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a side view of a governor embracing my improvement. Fig. 2 represents a plan view of the same. Fig. 3 represents a front view of the same. Fig. 4 represents, on a somewhat larger scale, a transverse section of the main shaft, showing the shield attachment and stop mechanism. Fig. 5 represents, on a similar scale, a side view of the stop mechanism.

My invention relates to the employment of a peculiarly-constructed adjustable screw-stop mechanism, in combination with the ratchet-shield and main shaft, for the purpose of preventing further action upon said shaft after the gate has been raised to the desired height, and also when the gate is closed, as hereinafter described.

A second feature of my invention consists in the combination, with the shield mechanism, of a peculiar lever device for raising the shield to stop the action of the governor mechanism, as hereinafter explained.

In the drawings, A denotes the supporting-frame. B indicates the driving-shaft, operated by belt or otherwise from the mill-shaft, machinery, or water-wheel, the speed of which is to be governed. C indicates the main shaft of the governor, connected, when in use, to the gate or gate-shaft of the water-wheel by suitable gearing, so that the rotation of shaft C shall increase or diminish the flow of water to the wheel, thus increasing or diminishing the speed of the motor, according to the direction of rotation. In the present instance, rotation of shaft C toward the left is for increasing, and toward the right for decreasing, the speed. D indicates the ball-shaft or governor-spindle, operated from the driving-shaft B by the beveled gears *d d*, and provided at its upper part by centrifugal balls or weights E E, supported at the ends of

arms *e e*, and connected with the slide F by links *f f*, so that said slide F will be moved up and down its bearing as the speed varies, by the action of the balls E, in the ordinary manner. G indicates the gear or ratchet wheel for receiving the action of the oscillating pawls *a a*, which impart motion to the shaft C, for opening and closing the gate. H indicates the ratchet-shield, arranged between the pawls *a a* and the face of the gear G, and being of such length that when in a central position it will prevent either pawl from engaging with the teeth. Shield H is supported from a hub or sleeve, H', arranged on shaft C, just inside the supporting-frame A, and said sleeve is provided with lugs or arms *b b'*, at its rear end, as shown. I indicates a rod pivoted to one of the lugs *b*, and extending from thence to slide F, its upper end being passed through the fork-plate J, which runs in the groove of said slide, and secured by nuts *c c* screwed onto the end of the rod I, above and below the fork-plate J, as shown. The rod I being thus connected directly from the slide F to the shield-piece H with only a single loose joint, and the leverage at the connection being short, the mechanism is rendered quite sensitive, and the shield is quickly moved by the slightest elevation or depression of the balls E. By means of the nuts *c c* the length of the connecting-rod I can be adjusted in a very convenient manner, so as to graduate or adapt the governor to any degree of speed at which it may be desired to run the water-wheel and machinery. The rod I and sleeve H' are also made in such a manner that the former can be readily changed to the opposite side of the shafts B C, and connected to the lug *b'* of the sleeve H'. This is of great convenience and facility in setting up the governors, as it permits of gearing to the gate-shaft in any position above or below shaft C, and also allows of the shaft B and regulator-spindle D being run in either direction, as most convenient.

The pawls *a a* extend in either direction along the top of the shield H, and are so formed that, when the shield is removed, the pawl will drop to the bottom of the space, and not simply catch the top of the tooth of the gear G. They thus impart a sure movement

to the shaft C, and much wearing of the teeth is prevented. The pawls *a a* are supported on a stud fixed in the corner of a quadrant, K, the hub of which works on the shaft C as a center, and said quadrant K is oscillated to give movement to the pawls *a* by a connecting-rod, L, one end of which works on a stud fixed in the quadrant corner, while the other is attached to and actuated by a crank, M, on the driving-shaft B, the quadrant and pawls being moved back and forth at each revolution of said shaft B. The studs which hold the connecting-rod L and pawls *a a* are joined to each other and supported by the front rim of the quadrant and the back rim *i*, the gear G, pawls *a a*, and rod L, all working in the same plane between said rims, so that there is no injurious side strain on the studs, while the parts are rendered very strong and durable, and can be made with a light weight of metal without liability of breaking. N indicates a screw-threaded sleeve, arranged on the shaft C, and secured in position by a set-screw, *o*, through its head O. P indicates a nut, screwed onto the end of the sleeve N, and provided with a set-screw, *p*, by which it can be firmly retained at any adjusted position. R indicates a nut, arranged loose on the screw-sleeve N, and provided with a projection or pin, *q*, extending outward from its face sufficiently to engage the pin *m* fixed to the shield-sleeve, as shown. The nut R is provided with lugs *s t* at either side, and the head O and nut P also have lugs *u* and *v*, respectively, for engaging with the lugs *s t*.

When the speed is high and the shaft C is revolved toward the right for closing the gate, the nut R is carried around with the screw N until the projection *q* strikes the pin *m*, which holds it by overcoming the friction on the screw, and, as the shaft revolves, nut R is moved along the screw until its lug *s* engages with the lug *u*, when it forces up the pin *m* against the opposing pressure of the balls E, and, by bringing the shield H to a central position, prevents further movement of the shaft, thus obviating any undue straining or breaking of the mechanism after the gate has been closed; or, if adjusted for the purpose, prevents the absolute closing of the gate. In similar manner, when the speed is slow and shaft C is being moved toward the left, the nut R will

be carried around until projection *q* strikes on the opposite side of pin *m*, when it will, in similar manner traverse along the screw N until lug *t* engages lug *v* on the nut P, and the shield will be forced to a central position, and further action of the shaft prevented.

It will thus be seen that in whichever direction the governor may be acting, the extent of its action is limited by the distance which the nut R traverses upon the screw N.

By means of the nut P, placed nearer to or farther from the head O, the mechanism may be adjusted to give a greater or less action upon the gate, and by loosening the set-screw *o*, the screw-sleeve can be adjusted so that the stop will take effect at any particular part of its revolution. This double stop is of much value, especially where two distinct motors are employed for driving a set of machinery, and the governor is operated by one of them.

T indicates a lever, fulcrumed on the frame at V, and arranged across beneath the shaft C. This lever is provided with a pair of lugs, *w w*, which project upward, and when said lever is raised, as in Fig. 4, by striking against the lugs *b b'* of the sleeve H', cause the shield to assume a central position, and thus hold the parts in such position that the pawls cannot engage the teeth of wheel G. Any suitable device may be employed for holding up the lever T.

I do not herein make claim to the employment of pawls and shield for the operation of the main shaft. Neither do I make claim, broadly, to a screw device for preventing further action of the governor after the gate has fully opened; but

What I do claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the shaft C and shield H H', of the screw-sleeve N O, adjusting-nut P, traverse-nut R, lugs *s t u v*, and pins *q m*, all constructed and arranged for operation, substantially as shown and described.

2. The combination, with the shield H H', provided with lugs *b b'*, of the lever T, provided with lugs *w w*, for the purpose set forth.

EDWARD WRIGHT.

Witnesses:

CHAS. H. BURLEIGH,
GEO. J. MOWRY.