J. REID.

Engine-Governor and Speed-Regulator.

No. 220,867. Patented Oct. 21, 1879.

Fig. 1.

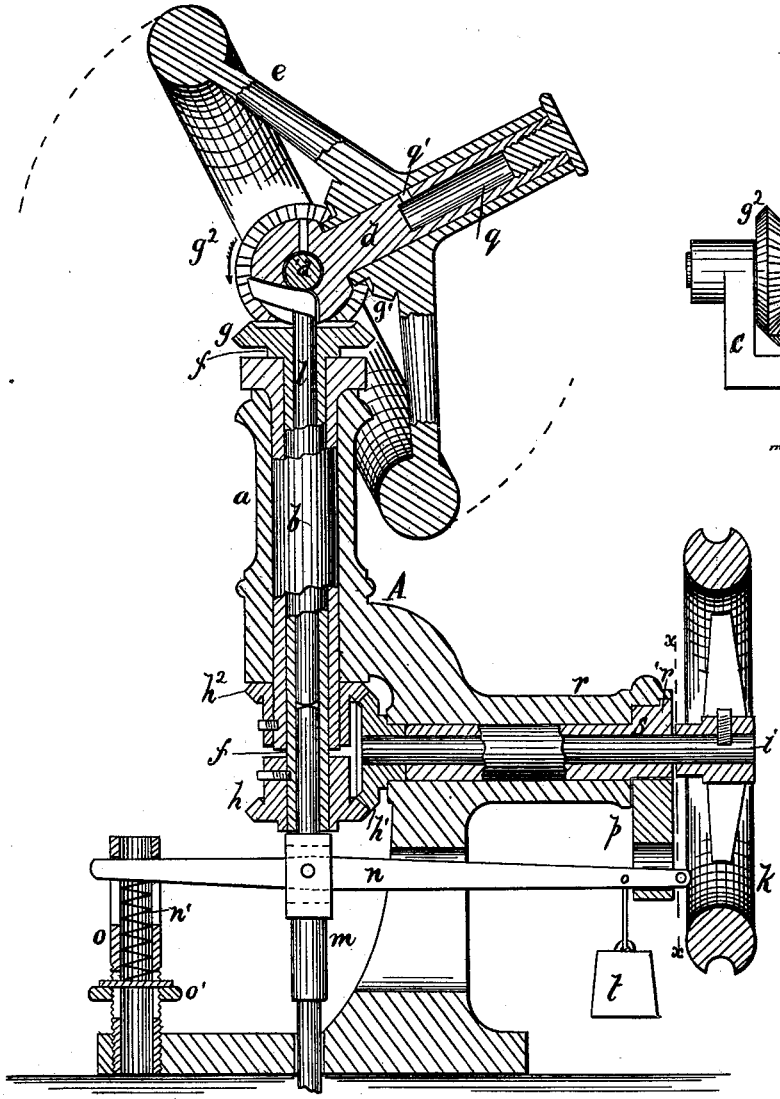


Fig. 2.

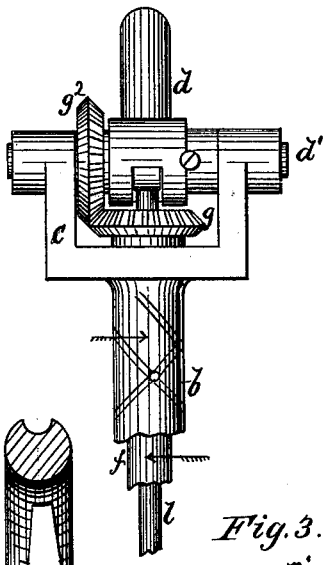
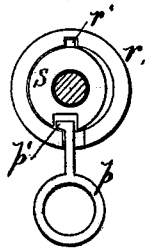


Fig. 3.



WITNESSES:

Henry N. Miller

C. Sedgwick

INVENTOR:

J. Reid

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH REID, OF MONROE, LOUISIANA.

IMPROVEMENT IN ENGINE-GOVERNOR AND SPEED-REGULATOR.

Specification forming part of Letters Patent No. **220,867**, dated October 21, 1879; application filed August 1, 1879.

To all whom it may concern:

Be it known that I, JOSEPH REID, of Monroe, in the parish of Ouachita and State of Louisiana, have invented a new and Improved Engine-Governor and Speed-Regulator, of which the following is a specification.

My invention relates to a governor based upon the principles of gyroscopic action.

The details of construction and operation will be described in connection with the accompanying drawings, wherein Figure 1 is a vertical section of my improved governor. Fig. 2 is an elevation, at right angles to Fig. 1, of the supports for the gyroscopic wheel. Fig. 3 is a section on line *x x* of Fig. 1, showing the stop mechanism.

Similar letters of reference indicate corresponding parts.

A is a frame of suitable form, having a hollow-standard portion, *a*, in which is fitted, so as to revolve freely, a tubular stem, *b*, that is formed at its upper end with jaws *c*. In the jaws *c* a lever, *d*, is hung at an inclination, on a pin, *d'*, that enters bearings in the sides of jaws *c*, so that the lever *d* may swing freely upon the pin *d'*. The gyroscopic wheel *e* is fitted to revolve freely. Within the tubular stem *b* is a loose tube, *f*, which carries on its upper end, within jaw *c*, a bevel-gear wheel, *g*, and on its lower end a bevel-gear, *h*. Attached to wheel *e*, around lever *d*, is a bevel-gear, *g'*, and on the pivot-pin *d'* is a loose bevel-gear, g^2, that meshes with gears *g g'*. A side extension of frame A carries the driving-shaft *i*, on the inner end of which is a bevel-gear, *h'*, meshing with *h* and with a gear, h^2, that is fast to the lower end of stem *b*.

Motion being imparted to shaft *i* by belt to its pulley *k*, the stem *b* and jaw *c* are revolved, and they carry around with them the wheel *e*, which is also revolved on its axis by the gears *g g'* g^2. With these gears corresponding in their number of teeth, they would cause a single rotation of *e* on its own axis at every revolution of *b*, and, by the addition of wheel *h*, the wheel *e* is caused to revolve twice in that time, which renders the governor more sensitive.

Within the tube *f* is a rod, *l*, the lower end of which rests on the end of valve-stem *m*, and its upper end is in contact with the pivoted end of lever *d*. As shown, the end of rod *l* enters a cam-shaped recess in lever *d*, so that as the lever *d* rises the rod *l* is forced downward, and relieved as lever *d* falls. Any suitable connection may be used whereby the change of lever *d* in position, according to velocity, is made to move the valve-rod, and the connections to the valve may be of any suitable character.

The rod *m* is slotted to receive a lever, *n*, one end of which rests on a spiral spring, *n'*, in a slotted tubular post, *o*, and the other end is supported in a hanger, *p*. Around the post *o* is a nut, *o'*, by which the tension of the spiral spring can be adjusted, and rod *m* thereby held with more or less pressure against the action of the governor, so that the normal speed of the engine is regulated by the tension at which the spring is set.

In operation, the shaft *i* and pulley *k*, turning to the right, the rotation of the other parts will be as indicated by the arrows, and the force acting on the gyroscope wheel *e* tending to revolve the same, assists the centrifugal and gyroscopic action, tending to raise the lever *d* toward a vertical position, thus rendering the governor very sensitive to changes in velocity. This sensitiveness may be increased by fitting the wheel *e* so as to revolve more rapidly on its own axis.

I provide a stop motion in connection with shaft *i* and lever *n*, whereby when the belt to pulley *k* breaks the valve of the engine is closed. This device is shown in Figs. 1 and 3.

The bearing *s* of shaft *i* is contained within an extension, *r*, of frame A, and is prevented from turning by a pin or feather, *r'*, or in any other suitable manner. The stem of the hanger *p* extends through a slot in *r* into a groove in bearing *s*, and is formed with an inclined lug, *p'*, by which the hanger is sustained. One side of bearing *s* is cut away or formed eccentric to permit a slight lateral movement of *p*. So long as the belt is on the pulley *k* the shaft *i* is retained central of *r*, and the bearing *s* retains the lug *p'* in place, so that the hanger and its weight *t* are supported; but if the belt breaks or slips off, the weight, acting by the inclined lug *p'*, moves the hanger *p* and bearing *s* sidewise until the

hanger is free to drop and move the valve-rod *m* downward.

This construction furnishes a reliable automatic stop device, which, being a portion of the governor that is regularly in use, is not liable to become gummed or stopped, but is always in working order. The bearing being held by the feather at the top, its sidewise movement is multiplied at the under side, and only a slight movement is required to relieve the hanger.

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

1. In governors for motors, in combination with the revolving stem *b*, jaws *c*, and valve-rods *l m*, the pivoted lever *d*, wheel *e*, tube *f*, and gears *g g' g²*, substantially as and for the purposes set forth.

2. The combination, with tube *b*, having bevel-gear wheel *h²* and jaws *c*, of the inclined lever *d*, having cam-shaped recess, the pin *d'*, having bevel-gear *g²*, the wheel *e*, rotating on lever *d* as an axis, and having bevel-gear *g'*, the loose sleeve *f*, having beveled gear-wheels *g h*, and the drive-shaft *i*, having bevel-gear wheel *h'*, as and for the purpose specified.

3. In governors for engines, the combination, with the driving-shaft *i* and pulley, and the lever *n*, for supporting the valve-rod, of the hanger *p*, formed with a lug, *p'*, the support *r*, and slotted bearing *s*, of an eccentric form, and arranged for operation substantially as described and shown, and for the purposes set forth.

JOSEPH REID.

Witnesses:
JOSIAH STAHL,
WILLIAM A. O'KELLY.