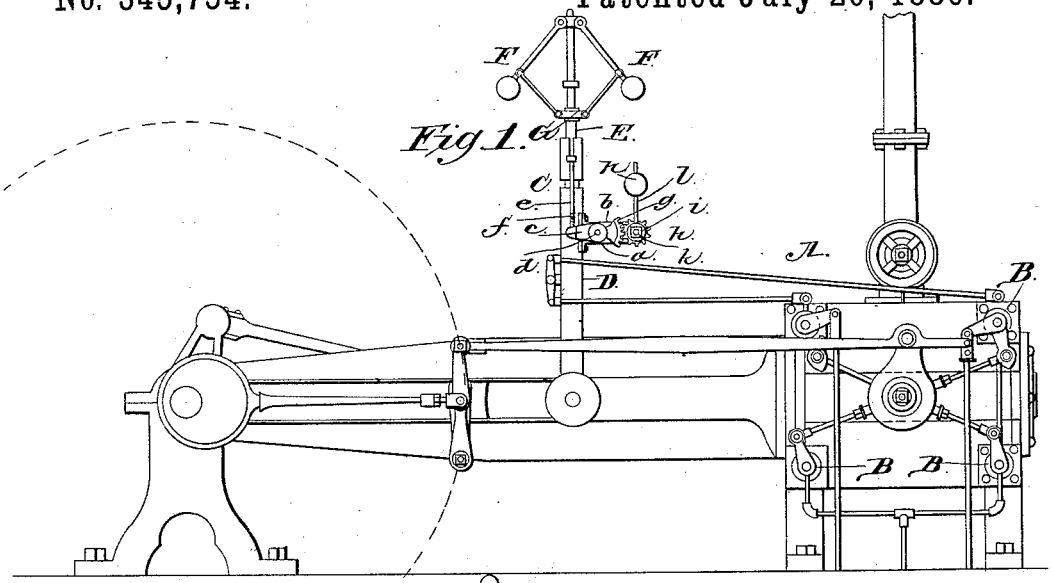
(No Model.)

J. O. WILSON.

SPEED CONTROLLER.

No. 345,754. Patented July 20, 1886.

Fig. 1.



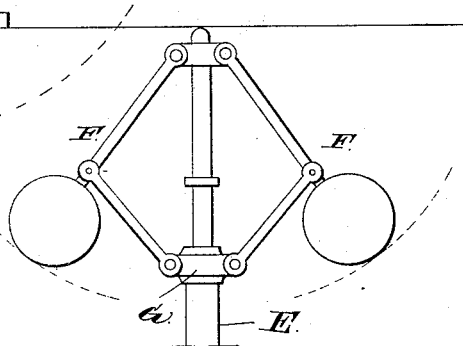
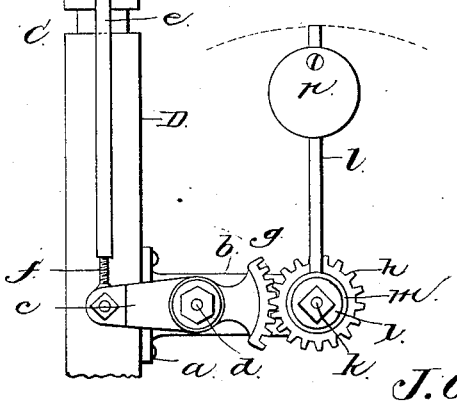


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

JOSEPH O. WILSON, OF CHESTER, PENNSYLVANIA.

SPEED-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 345,754, dated July 20, 1886.

Application filed January 26, 1886. Serial No. 189,837. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH O. WILSON, a citizen of the United States, residing at Chester, in the county of Delaware and State of Pennsylvania, have invented a new and useful Improvement in Speed-Controllers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improvement in speed-controllers for steam-engines; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

The object of my invention is to provide an attachment for the governor of a steam-engine to keep the engine running at the same speed, whether loaded or free, and under other varying conditions.

In the drawings, Figure 1 is a side elevation of a steam-engine with my improved apparatus for regulating the speed attached thereto. Fig. 2 is an enlarged detailed sectional view of the governor with my apparatus attached thereto.

A represents a Corliss steam engine, which is provided with the usual valves, B, and the usual valve-gearing.

C represents the governor, comprising the hollow standard D, the vertical rotating shaft E, the hinged arms carrying the governing-balls F, and the vertically-movable collar G, connected to the weighted hinged arms, all of which are of the usual well-known construction, and are attached to and operated by the engine in the usual manner. Governors thus constructed are not sufficiently sensitive to maintain an engine in constant operation at uniform speed under varying conditions, as when loaded or free, and this defect it is the object of my invention to overcome.

a represents a bracket, which is bolted to the standard, and has a horizontal extending arm, *b*. *c* represents a rocking arm, which is journaled centrally near the inner end of the arm *b* by a pivotal bolt, *d*. One extremity of the rocking arm is connected to the collar G by a rod, *e*, having a screw-coupling, *f*. The other end of the rocking arm is provided with a series of segmental rack-teeth, *g*.

h represents a pinion, having on one side a projecting sleeve, *i*. This pinion is journaled at the outer end of the arm *b* on a pivotal bolt, *k*, and meshes with the segmental rack-teeth *g*.

l represents a rod, which has at one end a collar, *m*, that fits over the sleeve *i*, and is firmly secured thereto.

The apparatus is so adjusted by means of the coupling *f* that when the engine is running at the required rate of speed the rod *l* is vertical. On the said rod is a weight, *n*, which may be adjusted up or down on the rod, and is provided with a set-screw, *o*, to secure it to the rod at any desired point.

It will be readily seen from the foregoing that my speed-controller is connected with the vertically-movable collar of the governor in such a manner that the rod *l* will be moved by the rising or falling of the said collar. As before stated, when the engine is running at the required rate of speed the weighted rod is vertical. Should the speed of the engine decrease sligl.tly, the weighted arm or rod is moved to the right as the governor-balls and collar lower, and the weighted rod is thrown off its equilibrium, and the weight thereof causes the governor-balls and collar to be lowered still farther, thereby moving the rods H so as to open the valves wider, thereby supplying more steam to the engine and causing it to increase its speed, which raises the weighted rod to its normal vertical position. Should the speed of the engine get beyond its required rate, the operation of the speed-controller is reversed, the weighted rod moving to the left, and thereby partly closing the valves to check the supply of steam to the engine and correspondingly decrease its speed.

The segmental rack-teeth and the teeth on the pinion are very fine to prevent lost motion, and the radius of the segmental rack is about three times greater than that of the pinion, thereby causing the weighted rod attached to the pinion to move very quickly and rendering it extremely sensitive, so that the slightest movement of the governor will be felt.

In experimental tests to which I have subjected my invention, with a loss of thirty pounds of steam-pressure I lost only one-half a revolution of the fly-wheel, and when the whole load of over two hundred horse-power was

relieved from the engine its speed was only increased one revolution.

I do not desire to limit myself to the precise construction herein shown and described, as it is evident that modifications may be made therein without departing from the spirit of my invention.

I wish it understood that I lay no claim to the construction shown in patent to Collamore, No. 73,578, in which supplemental weights are employed to regulate the governor. The distinctive feature of my construction resides in the fact that the weighted means is held in equilibrium when the engine is running at the required rate of speed, the adjustable coupling *f* permitting the weighted means to be adjusted in a vertical line, and thus is held in equilibrium, as stated.

Having thus described my invention, I claim—

1. In combination with a steam-engine governor, the bracket *a*, attached to the standard D thereto, the rock-arm *c*, pivoted to the bracket, the segment-teeth *g* on one end of the arm, the pinion *h*, meshing with the said teeth, and the weighted rod *l*, connecting with the pinion, as set forth.

2. In combination with a steam-engine governor, the rock-arm *c*, connecting with the same, the gear-teeth *g* on one end of the arm, the sleeve *i*, carrying the pinion *h*, meshing with the gear-teeth, and the weighted rod *l*, having a collar, *m*, fitting over and secured to the sleeve *i*, as set forth.

3. In combination with the standard D of the engine, having the governor mounted thereon, the bracket *a*, fitted to the standard at an intermediate point of its length, the rock-arm pivoted to the bracket and connecting with the governor, and a weighted rod geared to the rock-arm, as set forth.

4. In combination with an engine-governor, the rock-arm *c*, having gear-teeth, the weighted rod *l*, the pinion *h*, the rod *e*, and the adjustable coupling *f*, connecting the rock-arm to the rod *e*, whereby the weighted rod *l* may be adjusted through the coupling *f*, so that when the engine is running at the required rate of speed the rod *l* will stand in a vertical position, and thus will be held in equilibrium, as set forth.

5. In combination with a steam-engine governor, the rock-arm *c*, the adjustable connection between the rock-arm and the governor, and the weighted rod *l*, geared to the rock-arm, the adjustability of the coupling causing the weighted rod to be adjusted in a vertical line, and thus be held in equilibrium when the engine is running at the required rate of speed, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOSEPH O. WILSON.

Witnesses:
GEO. B. LINDSAY,
J. WALTER LINDSAY.