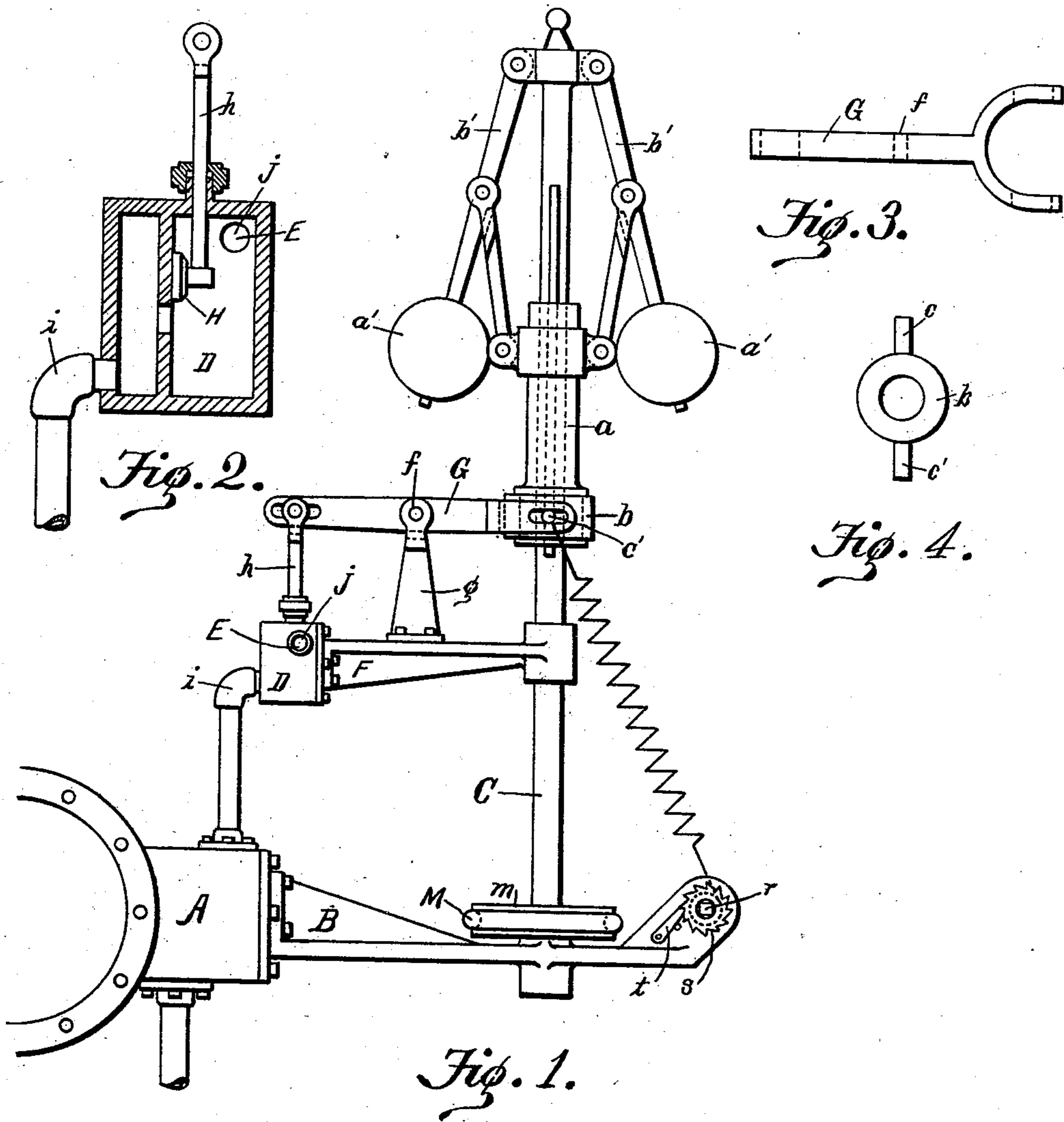


(No Model.)

G. E. HUNSINGER.  
ENGINE GOVERNOR.

No. 601,076.

Patented Mar. 22, 1898.



**WITNESSES.**

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# UNITED STATES PATENT OFFICE.

GEORGE EDWARD HUNSINGER, OF RAINHAM CENTRE, CANADA.

## ENGINE-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 601,076, dated March 22, 1898.

Application filed September 7, 1897. Serial No. 650,723. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE EDWARD HUNSINGER, a subject of the Queen of Great Britain, residing at Rainham Centre, in the county of Haldimand and Province of Ontario, Canada, have invented certain new and useful Improvements in Engine-Governors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to certain new and useful improvements in engine-governors, and has for its object to provide a simple, cheap, economical, and efficient means that can be readily applied to any form or style of engine for controlling the supply of steam to the cylinder. In this device the use of gear-wheels commonly employed in connection with this class of governors is entirely obviated, thus rendering the governor much more sensitive to the slight changes in the engine speed.

The invention consists in the general construction and arrangement of the various parts to be hereinafter described and claimed. Referring to the accompanying drawings for a better understanding of my invention, Figure 1 shows the device mounted in position for use upon an engine-cylinder. Fig. 2 is a partial side elevation and section of the steam-supply pipe and cut-off box, showing the interior of the box and the valve therein. Figs. 3 and 4 are plan views of the valve-actuating lever and the ring by which one end of the lever is loosely connected to the sleeve actuated by the governor-balls.

Like letters of reference refer to corresponding parts throughout the figures.

In illustrating my invention I prefer to show it in connection with the common and well-known horizontal reciprocating engine-cylinder and have shown the mechanism as arranged and supported in substantially a vertical position. These relations, however, may be altered to suit the various conditions and to adapt the mechanism to the various styles and forms of engines, and as this is a mere matter of mechanical skill it is not thought

necessary to illustrate more than one form of applying the invention.

Referring to the drawings, A indicates the engine-cylinder, upon one side of which there is secured, by any suitable means, a bracket B, adapted to furnish a support and end bearing for the vertical main driving-shaft C. The supply steam-pipe in this instance enters the top of the steam-chest, and at a convenient distance above the chest there is fitted in the pipe the cut-off box D, so arranged as to compel the steam admitted into the supply-pipe E to pass therethrough for a purpose to be hereinafter referred to.

Upon one side of the cut-off box there is suitably secured a second bracket F, arranged to extend in a direction parallel with the bracket B and provided with a journal at its outer end to receive the main driving-shaft C. This shaft is held in position by the two bearings and has mounted upon its upper end the common and well-known form of governor-balls and their connecting parts. The sleeve *a*, which is operated upon the shaft by the action of the balls, is provided with a loose collar *b* at its lower end, having the pins *c c'* arranged diametrically opposite each other upon the outer periphery of the rim.

G indicates a lever fulcrumed at its central point *f* upon the upper end of the standard *g*, which is mounted in any suitable way upon the upper bracket F. This lever is bifurcated at one end and provided with loops to engage the pins *c c'* upon the collar *b*, and the opposite end is pivotally connected to the stem *h* of the valve H, carried within the cut-off box.

As above referred to, the steam entering the supply-pipe E passes this cut-off box, which is so constructed upon the interior as to be divided into two chambers, separated by the valve H, one of which connects with the branch *i* of the steam-pipe and the other of which connects with the branch *j*. Thus it will be seen that as the steam passes through the box its passage is controlled by the valve, which is closed and opened automatically by the action of the governor-balls through the medium of the sleeve *a* and lever G.

The shaft C is driven from the main engine-shaft by means of the cross-belt M, which is belted to the flange-plate *m*, secured upon

the shaft at its lower end. By this means the complicated gearing is rendered unnecessary and the action of the governor rendered more sensitive. When the engine is in motion and the shaft C rotated by means of the power transmitted through the belt M, the governor-balls are caused to raise by their centrifugal force, lifting the sleeve *a*, which carries with it the bifurcated end of the lever G, thus depressing the opposite end to close the valve in the cut-off box. It will thus be seen that as the pressure increases, tending to increase the speed of the engine, the governor-balls will be raised proportionately to actuate and close the steam passage-way, and thereby control the movement of the engine.

It will be obvious that the closing action of the valve H can be controlled by the adjustment of the governor-balls *a'* upon their carrying-arms *b'* in the usual manner. I have shown, however, another means which I prefer and which has been found to produce better results. This latter means consists of a coiled spring having its upper end secured to the collar *b*, either by means of the pins *c c'* or by any other suitable manner, and its lower end secured to the rod *r*, around which it is adapted to be wound, where it is held in position by means of the pawl and ratchet *s t* at one end of the rod. This rod *r*, around which the lower end of the spring is turned, is journaled in bearings supported upon the outer end of the bracket B, and the ratchet *s*, which is rigidly secured to one end of the rod, is adapted to be engaged and held in position by means of the pawl *t*, which is pivoted to the bracket B. When it is necessary to increase the speed of the engine, or, in other words, to allow more steam to pass into the cylinder without being interrupted by the action of the governor-balls upon the valve H, a wrench or handle is applied to one end of the rod and the spring wound thereon until

sufficient tension has been given to it to resist the lifting action of the balls.

It will be apparent to those familiar with the art that some slight modifications may be made in the specific construction and arrangement of the various parts as they are herein shown and described, and although I have preferred to illustrate my invention in this form I do not desire to limit myself thereto.

Having thus described my invention, what I claim is—

In a governor for steam-engines, the combination with the cylinder of a steam-cut-off pipe having a cut-off box, divided into two chambers, inserted therein, a valve within said cut-off box adapted to separate said chambers, and to shut off the steam passage-way therethrough, brackets secured to said steam-cylinder and cut-off box, a vertical shaft journaled in said brackets, governor-balls mounted upon the upper end of said shaft, a sleeve adapted to be actuated longitudinally upon the shaft by said balls, a collar loosely carried at the lower end of said sleeve, a lever fulcrumed at its central point upon a bracket supported upon said cut-off box, said lever having one end bifurcated to engage with suitable connections upon said collar and the other end pivoted to the stem of said valve within the cut-off box, a pulley secured to said vertical shaft, means for connecting said pulley with the main drive-shaft of the engine, and a spring having one end secured to said collar and the other end adjustably secured to the outer end of the bracket upon the engine-cylinder, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE EDWARD HUNSINGER.

Witnesses:

JOHN E. FISSETTE,  
PETER HUNSINGER.