

(No Model.)

F. W. MOUNT.
STEAM ENGINE REGULATOR.

No. 498,672.

Patented May 30, 1893.

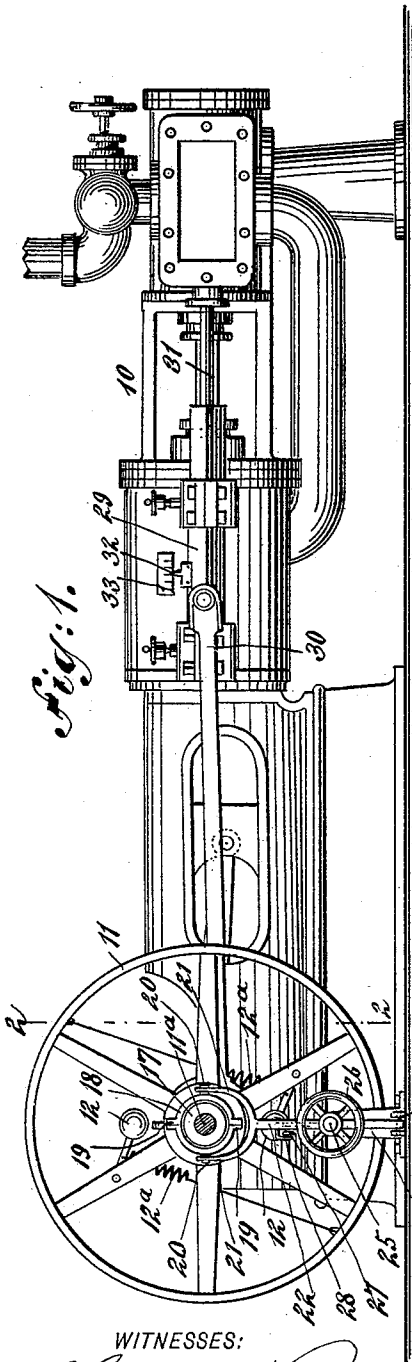


Fig. 1.

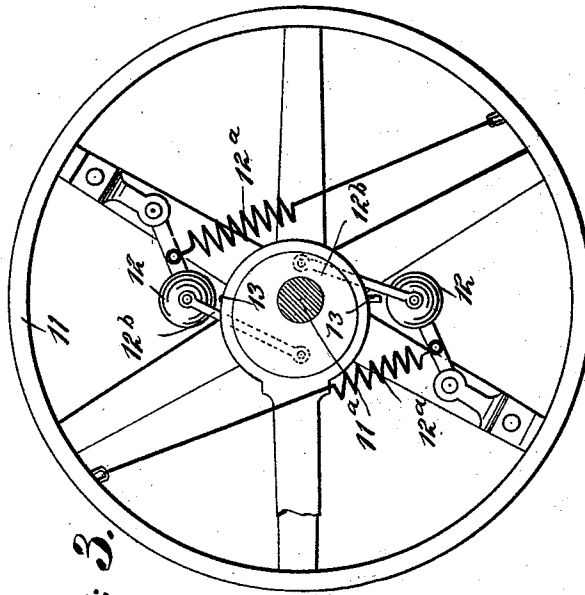


Fig. 3.

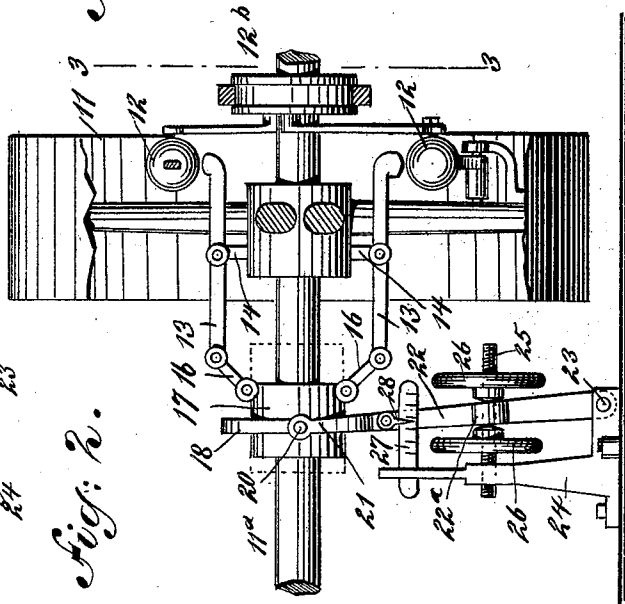


Fig. 2.

WITNESSES:

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FREDERICK W. MOUNT, OF ST. JOHN, CANADA.

STEAM-ENGINE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 498,672, dated May 30, 1893.

Application filed October 6, 1892. Serial No. 448,018. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. MOUNT, of St. John, in the Province of New Brunswick and Dominion of Canada, have invented a new and Improved Steam-Engine Regulator, of which the following is a full, clear, and exact description.

My invention relates to improvements in engine governors, and especially to that class of governors which are adapted for use in connection with engines operated in pairs. For many purposes it is desirable to run high speed engines in pairs and connect their shafts or provide them with a common shaft, but where the engines have separate governors, the governors will seldom work together, and it follows that one engine will be badly overloaded while the other will be badly underloaded, and the result is of course, expensive and the work unsatisfactory.

The object of my invention is to produce a simple regulator as an attachment to the ordinary shaft fly ball governor, by which the cut-off of either of the engines may be accurately regulated and each engine thus made to do its appropriate part of the work.

A further object of the invention is to arrange the regulator and the governor so that they may be operated without stopping the engines, and thus in case of a hot-box or other slight injury to one engine, a greater part of the load may be lifted to the other without interfering with the work.

To these ends, my invention consists in a regulator, the construction of which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of a compound high speed tandem engine provided with my improved regulating attachment. Fig. 2 is an enlarged sectional view on the line 2—2 in Fig. 1, showing the regulating mechanism in detail; and Fig. 3 is a cross section on the line 3—3 in Fig. 2, showing more particularly the arrangement of the governor, but this is of the usual kind and forms no part of my invention.

In the drawings, 10 represents a compound

tandem engine, although the engine may be of any usual type, and this is provided with the usual fly wheel 11 carried on the crank shaft 11^a, and the crank may be connected by means of clutches or in any suitable way to another engine. The governor is provided with the usual centrifugal governor balls 12, which are drawn toward the center of the wheel by the usual springs 12^a, used for the purpose in this class of governor, and the governor balls are also connected in the ordinary manner with the eccentric 12^b. The governor is not shown in detail as it forms no part of this invention, and my improved attachments may be connected with any governor having the centrifugally-operated governor balls.

On opposite sides of the hub of the fly wheel are arranged levers 13, which extend nearly parallel with the shaft 11^a and are fulcrumed on studs 14 which are secured to the hub. The free ends of the levers are brought in contact with the governor balls 12, as shown best in Fig. 2, not however, connected to the said balls, but merely touching them. The opposite ends of the levers 13 are connected by means of links 16 with a sleeve 17 which slides on the crank shaft 11^a.

The sleeve 17 turns in a ring 18, which is made in two parts and bolted together on opposite sides, as shown at 19, and the ring has on diametrically opposite sides, projecting trunnions 20, to which is pivoted the forked upper end 21 of a depending lever 22, the connection between the lever and sleeve being substantially like the usual connection with clutch pulleys. The lower end of the lever is pivoted, as shown at 23, to the base of an upright 24, this upright being arranged beneath the shaft 11^a, and the upright is provided with a horizontally threaded stud or screw 25, which is fixed to the upright and extends parallel with the shaft 11^a. The lever 22 slides loosely on the threaded stud or screw, being enlarged and bored out for this purpose, as shown at 22^a, and the lever is held between hand wheels 26, which are threaded to turn on the screw 25. It will thus be seen that by turning and adjusting the wheels, the lever may be shifted to the right or left as desired and held in any necessary position.

Above the hand wheels 26 is a graduated scale 27, over which moves a pointer 28 carried by the lever 22.

The balls 12 of the governor are drawn toward the shaft 11^a by their springs in the usual way, and they may be arrested in any part of their orbit by adjusting the hand wheels 26 and lever 22, as the hand wheels clamp the lever and hold the sleeve so that the balls cannot move inward. This will not prevent the balls from moving outward so as to act in case the load is suddenly lessened or the steam pressure increased, the balls having complete freedom to move outward and maintain a constant speed in the engine.

An indicator substantially like the indicator and pointer described above is applied to the valve rod of the engine so that the point of cut-off may be easily ascertained by watching it, and the point indicated on the scale 27 by the pointer 28, corresponds with the point of cut-off in the steam valve of the engine. This construction is shown in Fig. 1.

A slide 29 is pivotally connected with the eccentric rod 30, and is secured to the valve rod 31 in the ordinary manner. The slide 29 has a pointer or indicator 32, which travels opposite a scale 33, exactly like the scale 27, and the cut-off as indicated on one scale corresponds with the other, the cut-off in one case being adjusted by the hand wheels 26 and in the other indicated by the travel of the slide.

The device works as follows: We will suppose that the apparatus described is applied to a pair of engines connected together either by having their shafts rigidly fastened together, or by a shaft fitted with friction clutches, or in any convenient way which will cause them to have a common shaft, or both engines may be belted to a counter shaft. Now if the device is attached to the right hand engine of the pair, this engine should be speeded two or three revolutions more than its mate. The hand wheels 26 are then turned to the right or the left until the balls 12 are brought into the circle in which they revolve when the engine has the required proportion of the total load of both engines. This proportion of the load can be varied at will at any time when the engines are running, either to equalize the load or to put more on to either of the engines, by simply changing the position of the hand wheels, which change affects the lever 22 and slides the sleeve 17. When so adjusted, the governor of the engine which is not provided with the device will be found to be doing the regulation for both engines, that is to say, supposing one adjusted to take one hundred and fifty horse power and the maximum load of both engines

to be three hundred and twenty-five horse power with a minimum average load of, say, two hundred and eighty horse power; the engine not having the device attached, and consequently having complete freedom in its governor, will then do the balance of the work, varying from one hundred and thirty-five to one hundred and seventy-five horse power.

It will be seen that either or both engines may be made to cut off in the desired place and at any desired parts of the total work, and that the governor may be instantly changed so as to shift more or less of the work from one to the other engine. The invention can be attached to any number of engines connected by shafts or having a common shaft, and it will act in connection with any number of balls so long as the number of levers is made to correspond with the number of balls. It can also be used on any kind of an engine having governor balls acted upon by centrifugal force.

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

1. The combination, with an engine governor having centrifugally-operated fly balls and a sliding sleeve connected with the balls, of a swinging lever pivotally connected with the sleeve so as to move the same, and a screw mechanism for adjusting the lever, substantially as described.

2. The combination, with an engine governor having centrifugally-operated fly balls and a sliding sleeve, of a swinging lever having one end pivotally connected with the sleeve, a pair of adjustable hand wheels or nuts arranged to clamp the lever and regulate its movement, and an indicator operated by the lever and arranged to indicate the cut-off of the engine as regulated by the regulator and the governor, substantially as described.

3. The combination, with an engine governor having centrifugally-operated balls and a sliding sleeve operating to control the movement of said balls, of a swinging lever having one end pivotally connected with the sleeve, a screw mechanism for adjusting and fastening the swinging lever, an indicating scale arranged at one side of the lever, and a pointer carried by the lever and held to move over the scale, the scale and pointer being arranged to indicate the point of the engine cut-off as controlled by the regulator and the governor, substantially as described.

FREDERICK W. MOUNT.

Witnesses:

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