

(No Model.)

2 Sheets—Sheet 1.

E. L. MILLS.
STEAM ENGINE GOVERNOR.

No. 485,817.

Patented Nov. 8, 1892.

Fig. 2.

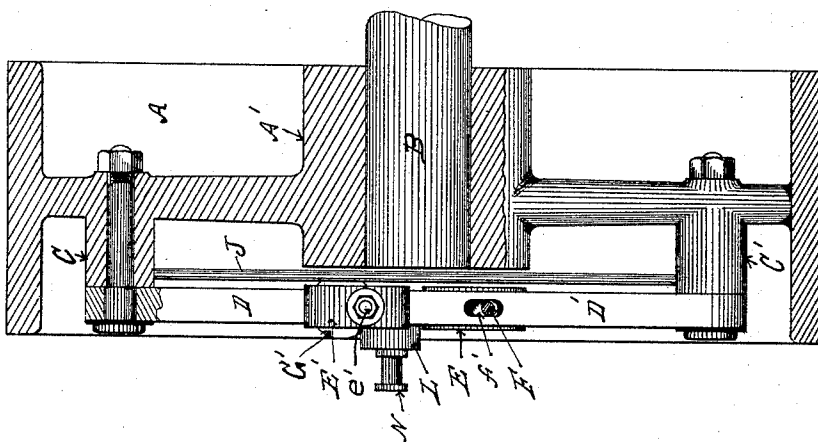
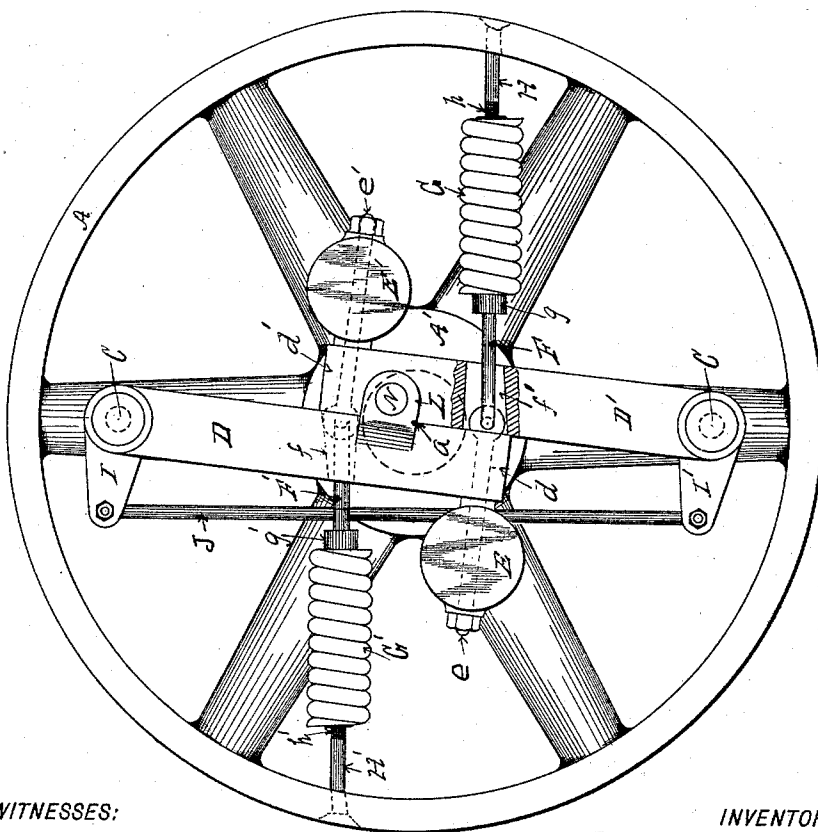


Fig. 1.



WITNESSES:

C. O'Brien.
J. Bassett

INVENTOR

Edward L. Mills

BY

H. Sturgeon

ATTORNEY.

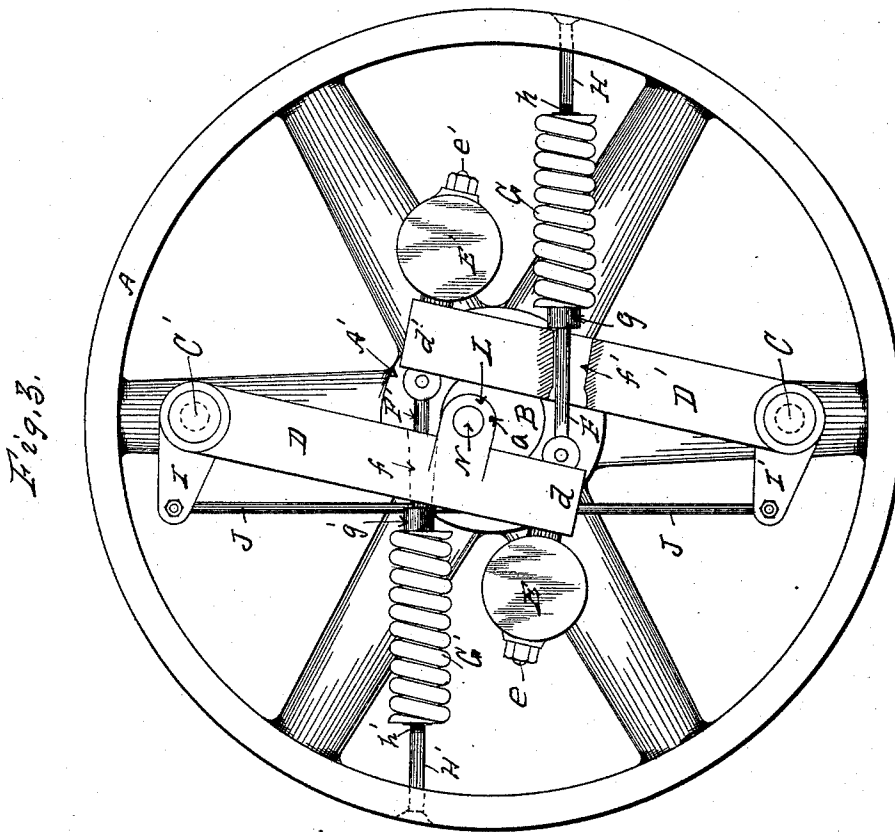
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WITNESSES:

L. O'Brien.
F. J. Bassett

INVENTOR

INVENTOR
Edward I. Mills

BY

A. S. Stevens

ATTORNEY.

UNITED STATES PATENT OFFICE.

EDWARD L. MILLS, OF ERIE, PENNSYLVANIA.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 485,817, dated November 8, 1892.

Application filed May 18, 1892. Serial No. 433,466. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. MILLS, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Steam-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, and to the letters of reference marked thereon, forming part of this specification.

My invention consists in the improvements in steam-engine governors hereinafter set forth and described, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation of my improved steam-engine governor when the eccentric-pin thereof is in position to produce the greatest possible movement of the valve. Fig. 2 is a vertical central section of same, some of the parts thereof being shown in elevation. Fig. 3 is a view in elevation of my improved steam-engine governor when the eccentric-pin is in position to produce approximately the shortest movement of the valve.

The object of my invention is to construct a steam-engine governor adapted to be placed within the driving or balance wheel on the main shaft of the engine in which the governing mechanism consists of two pendulum-levers, one of which supports an eccentric or eccentric-pin for operating a valve-rod, said pendulum-levers having centrifugally-operating weights and centripetally-operating springs secured to the farther ends thereof and being so coupled together as to be actuated and in unison by the centrifugal and centripetal forces acting thereon, as is usual in the type of steam-engine governors known as "shaft-governors."

In the construction of my improved steam-engine governor illustrated in the drawings, A is the driving or balance wheel of a steam-engine, and B the main engine-shaft.

To bosses C and C' on opposite arms of the wheel A, I pivot the ends of the pendulum-levers D and D', the free ends *d* and *d'* of said levers extending toward and across the

hub A' of the wheel A and the engine-shaft B, secured therein, so as to lap by each other for some distance, as illustrated in Figs. 1 and 3.

On the bar D, somewhat above the center of the main shaft B, I secure a lug L, which projects laterally therefrom, so as to extend some distance over the lever D', and in this lug L, I secure a wrist-pin N, adapted to receive and actuate an eccentric-rod. (Not shown.) To the ends *d* and *d'* of the levers D and D' are secured weights E and E', preferably by means of eyebolts *e* and *e'*, and in the eyes of the bolts *e* and *e'* are pivoted spring-rods F F', which pass through slotted openings *f* and *f'* in the levers D and D' and connect with the ends of spiral springs G and G', at which point collars *g* and *g'* are secured thereto, which operate as stops to limit the outward movement of the free ends *d* and *d'* of the levers D and D'. The outer ends of the springs G and G' are secured to rods H and H', the outer ends of which rods are secured in holes in the rim of the wheel A, the inner ends *h* and *h'* thereof being screw-threaded, so that by rotating them the tension of the springs G and G' can be adjusted as desired. To the pivoted ends of the levers D and D' are secured laterally-projecting arms I and I', between the outer ends of which arms is pivoted a connecting-rod J, which operates to synchronize the movements of the levers D and D'.

In operation the tension of the springs G and G' are adjusted so that at a given speed of rotation of the wheel A the centrifugal force acting on the weights E and E' will exactly counterbalance the centripetal force of the springs G and G', the location of the lug L and the wrist-pin N therein being such that when the wheel A is at rest and the levers D and D' are in contact, as shown in Fig. 1, the wrist-pin N is farthest from the center *a* of the shaft B and is adapted in that position to move the valve to its extreme traverse. When, however, the wheel A is running at such speed that the centrifugal force acting on the weights E and E' sufficiently overcomes the centripetal force of the springs G and G', so that the free ends *d* and *d'* of the levers D and D' are moved apart thereby, as illustrated in

Fig 3, until the levers D and D' contact with the stops *g* and *g'* on the rods F and F', then the wrist-pin N is at its nearest point of approach to the center *a* of the shaft B, and consequently it moves the valve its shortest traverse. Thus an increase of the speed of the wheel A operates to shorten the traverse of the valve and a decrease of the speed thereof to lengthen the traverse of the valve, so that the steam is automatically cut off by the movement of the valve at such point as may be required, the same being regulated by the increase or the decrease of the speed of the wheel A above or below the normal speed at which it is adjusted to run.

Having thus fully described my invention, so as to enable others to construct and operate the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, in a steam-engine governor, of pendulum-levers, one of which supports a wrist-pin or eccentric for driving an eccentric-rod, and a rod connecting said bars so as to synchronize the movements thereof, with centrifugally-operating weights and centripetally-acting springs secured to the free ends of said levers, substantially as and for the purpose set forth.

2. The combination, in a steam-engine governor, of two pendulum-levers, one of which supports a wrist-pin or eccentric for driving an eccentric-rod, with laterally-projecting arms on said pendulum-levers and a rod extending from the arm on one lever to the arm

on the other lever, substantially as and for the purpose set forth.

3. The combination, in a steam-engine governor, of two pendulum-levers, one of which supports a wrist-pin or eccentric for driving an eccentric-rod, and laterally-projecting arms on said levers connected together by means of a rod pivoted thereto, with centrifugally-operating weights and centripetally-acting springs connected directly to the free ends of said levers, substantially as and for the purpose set forth.

4. The combination, in a steam-engine governor, of two pendulum-levers, one of which supports a wrist-pin or eccentric for driving an eccentric-rod, connected together so that the movements of said levers are synchronous, and centrifugally-operating weights secured to the free ends of said levers, with centripetally-operating springs, each of which is connected to the free end of one of said levers, so as to act in opposition to the centrifugally-operating weight thereon, by means of a rod passing through a slotted opening in the lever opposite to the one to which it is secured, and stops on said rods limiting the outward movements of said levers, substantially as and for the purpose set forth.

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

EDWARD L. MILLS.

Witnesses:

C. O'BRIEN,

JOHN S. RILLING.