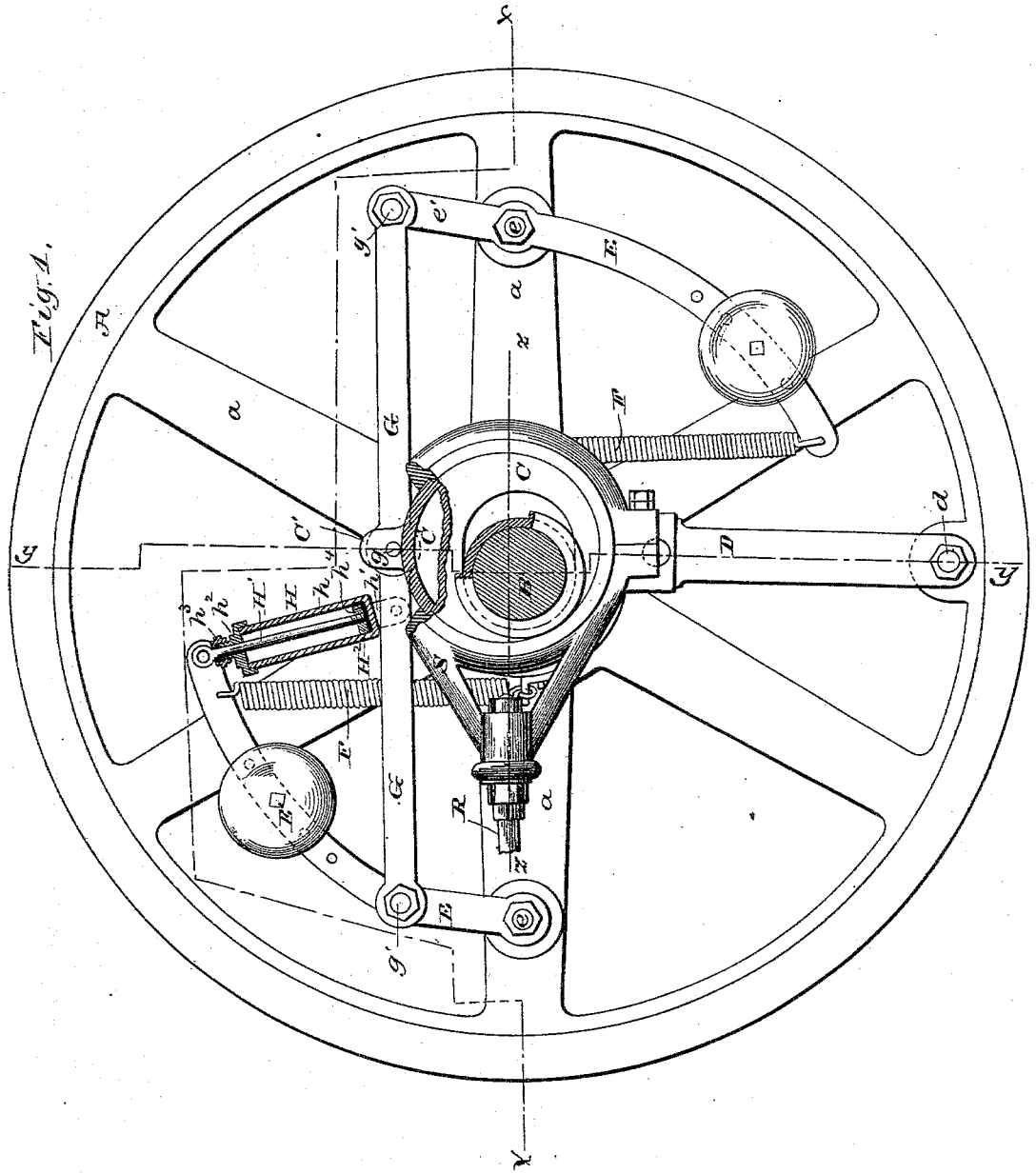
(No Model.) 2 Sheets—Sheet 1.

A. L. IDE.

STEAM ENGINE GOVERNOR.

No. 301,720. Patented July 8, 1884.

Fig. 1.



Witnesses.
Jno. W. Stockett.
C. C. Poole

Inventor
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per W. E. Dayton
Attorney

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

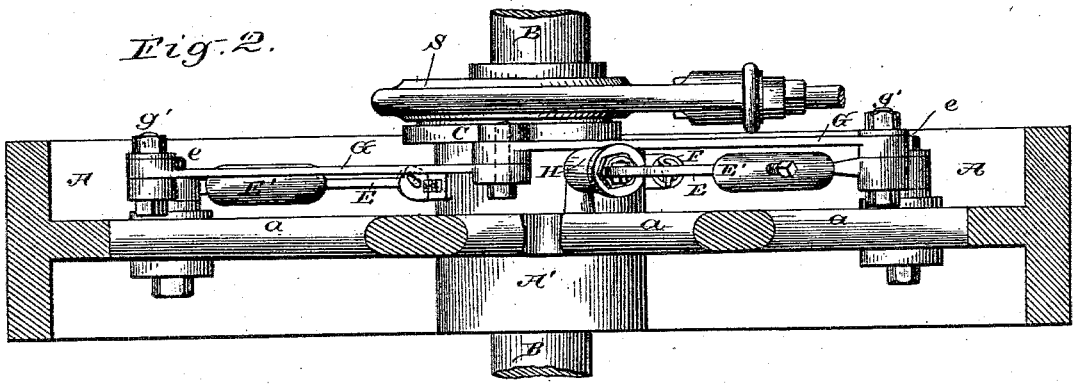


Fig. 3.

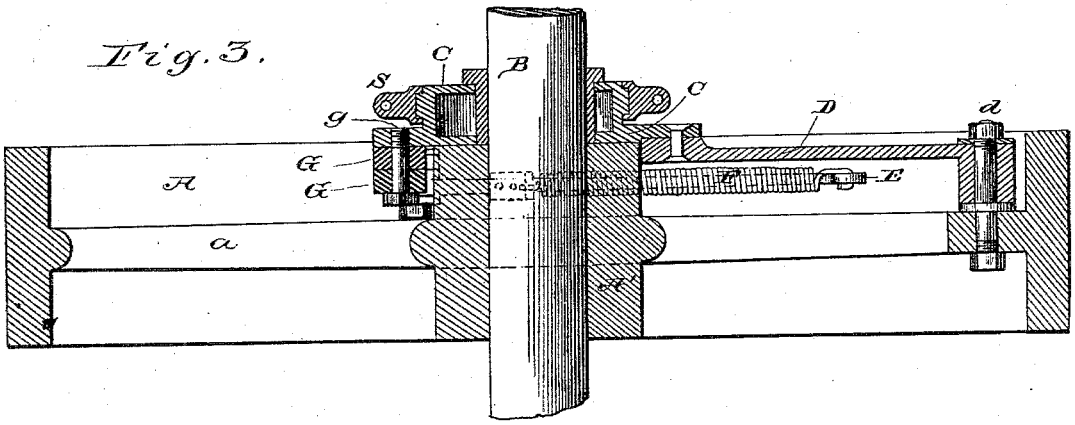
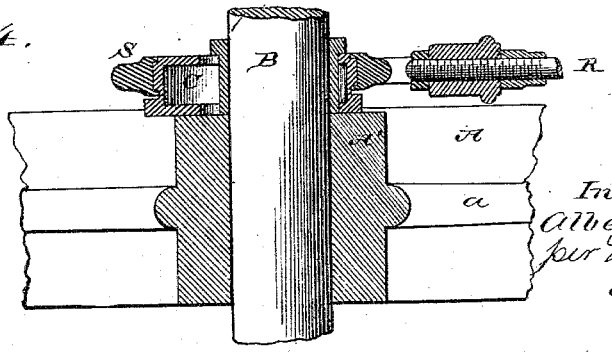


Fig. 4.



Witnesses:
Jno. W. Stockett,
C. C. Poole

Inventor.
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per W. E. Dayton
Attorney

UNITED STATES PATENT OFFICE.

ALBERT L. IDE, OF SPRINGFIELD, ILLINOIS.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 301,720, dated July 8, 1884.

Application filed July 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. IDE, of Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Steam-Engine Governors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of steam-engine governors known as "fly-wheel governors," and has for its primary object to provide means for holding the eccentric steadily in its proper poised position, in opposition to the tendency of certain extraneous forces which are calculated to disturb the movements of the valve, as sought to be determined by the balanced forces of weights and springs when the engine is in motion.

To this end the invention consists in the combination of a dash-pot with the governor and pulley, said dash-pot connected with a fixed and a movable part, or with two relatively or unequally movable parts—as, for example, with the extremity of a weight-lever and the pulley-hub.

In this class of governors the position of the eccentric is variably determined by the opposing and self-balancing forces exerted by the centripetally-acting spring or springs and the centrifugally-acting weight or weights connected with said springs, the intention being to hold the eccentric permanently in a certain poised position for a given speed of the wheel to which the governor is applied, and to vary the position of the eccentric exactly as the speed of said wheel is varied. There are, however, certain temporarily-acting causes of disturbance calculated to change the position of the eccentric independently of the speed of the wheel. The principal of these disturbing causes is the inertia of the reciprocating parts, including the eccentric and the parts actuated thereby; and a secondary cause is the gravity of the eccentric when not counterbalanced by some special device for the purpose. At a regular and very high speed of the governor wheel or pulley these disturbing forces operate but slightly, owing to the momentum of the weights, which serve to prevent their deflection from a regular course; but at lower speeds than that at which the apparatus is adjusted to run, and particularly in accelerating or retarding the engine, as in starting up or slowing down, these incidental disturbing forces interfere materially with the valve action and give an objectionable irregularity to the movements of the weights. In the case of an engine used for running a dynamo for electric-lighting purposes, and subject to sudden and wide changes in requisitions of power and speed, the effects of the disturbances referred to manifest themselves also in the quality or intensity of the lights. A dash-pot constructed and attached to the apparatus in such manner as to prevent sudden movements of the weight-levers or of the eccentric is found in practice to wholly overcome the defects indicated and to give a desirable steadiness and regularity to the movements of the movable parts of the governor, as well as accuracy and reliability to the cut-off action of the valve.

The improvement will be understood from the following description and accompanying drawings.

In said drawings, Figure 1 is a side elevation of a pulley provided with a governor having my improvement, the dash-pot being shown in axial section. Fig. 2 is a section of the pulley in the indirect line *x x* of Fig. 1. Fig. 3 is a section of the pulley and other parts in the indirect line *y y* of Fig. 1. Fig. 4 is a fragmentary section of the pulley and other parts in the line *z z* of Fig. 1.

A is a pulley or wheel having arms *a a*, and secured by its central hub to the shaft B.

C is an eccentric having the slot or opening *c*, by which it movably embraces the shaft B; and D is an arm attached to the eccentric and supporting it from the body of the pulley by a pivot-pin at *d*.

S is the eccentric-strap, applied in any approved manner to the eccentric and joined with the valve-rod R.

E E are two upright levers, fulcrumed at *e e* to opposite points on the pulley A, and E′ E′ are the weights applied adjustably as to their position to said levers. The weight-levers project in opposite directions from their pivotal points, so that the weights E′

thereon, when properly located, stand at diametrically opposite points of the pulley and counterbalance each other. One of the levers E is extended beyond its fulcrum *e* by the short arm *e'*. To the extremity of this arm *e'*, and to the opposite lever E, at a point inward an equal distance from the fulcrum, are pivoted the outer ends of connecting-rods G G, whose inner ends are pivotally joined to the eccentric C, preferably by a common pin, *g*, to a lug, C', located on the eccentric at a point opposite the supporting-arm D, said rods G being arranged substantially in line with each other and at right angles with said supporting-arm. Near the free extremities of the levers E E, and at points equally distant from their fulcra, coiled springs F F are connected therewith, and the opposite ends of said springs are attached to suitable points on the pulley. In this construction the equal weights E' evidently counterbalance each other, leaving the eccentric without counterbalance and subject to the action of gravity whenever the slot *c* therein is vertical.

H is a dash-pot, the cylinder *h* of which is provided at its closed end with a lug, *h'*, by which it is pivotally connected either with the pulley, the eccentric, or one of the rods G. As here illustrated, it is connected with a rod, G. Said dash-pot cylinder has at its open end a close-fitting cap, h^2, through a central stuffing-box, h^3, on which passes the piston-rod H'. The outer end of this rod is pivotally connected with the end of one of the weight-levers E, and its inner end is provided with a piston, H^2, fitted to the interior of the cylinder *h*, and apertured at h^4. The cylinder of the dash-pot is filled with glycerine or some other non-compressible liquid, preferably one that is also not congealable at a temperature to which the engine is likely to be exposed. By means of the dash-pot applied to the relatively movable and stationary parts or to the unequally-moving parts, as described, wide and sudden radial movements of the weights E' are prevented, and as a consequence the governor will have a steady and efficient action at all speeds of the pulley or wheel to which said governor is applied. The aperture h^4 will be made of such size (according, of course, with the size of the cylinder, springs, and weights) as to allow all necessary promptness of action on the part of the governor, and said aperture may, if desired, be made adjustable to its size by ordinary and well-known means for the purpose.

The dash-pot, while preferably connected with the end of the lever E, may obviously be attached to the eccentric itself and to a fixed or less movable part of the apparatus.

By the term "dash-pot" in the appended claim I mean the device technically known by that name—usually comprising a closed cylinder, a piston having a passage through or around it, and a fluid confined in the cylinder, as shown—or its equivalent.

I claim as my invention—

In a fly-wheel governor, the combination, with relatively-movable parts, of a dash-pot, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

ALBERT L. IDE.

Witnesses:
J. F. BUNN,
CHAS. A. ORR.