(No Model.)

A. H. RAYNAL.

GOVERNOR FOR STEAM ENGINES.

No. 450,917. Patented Apr. 21, 1891.

Fig. 1.

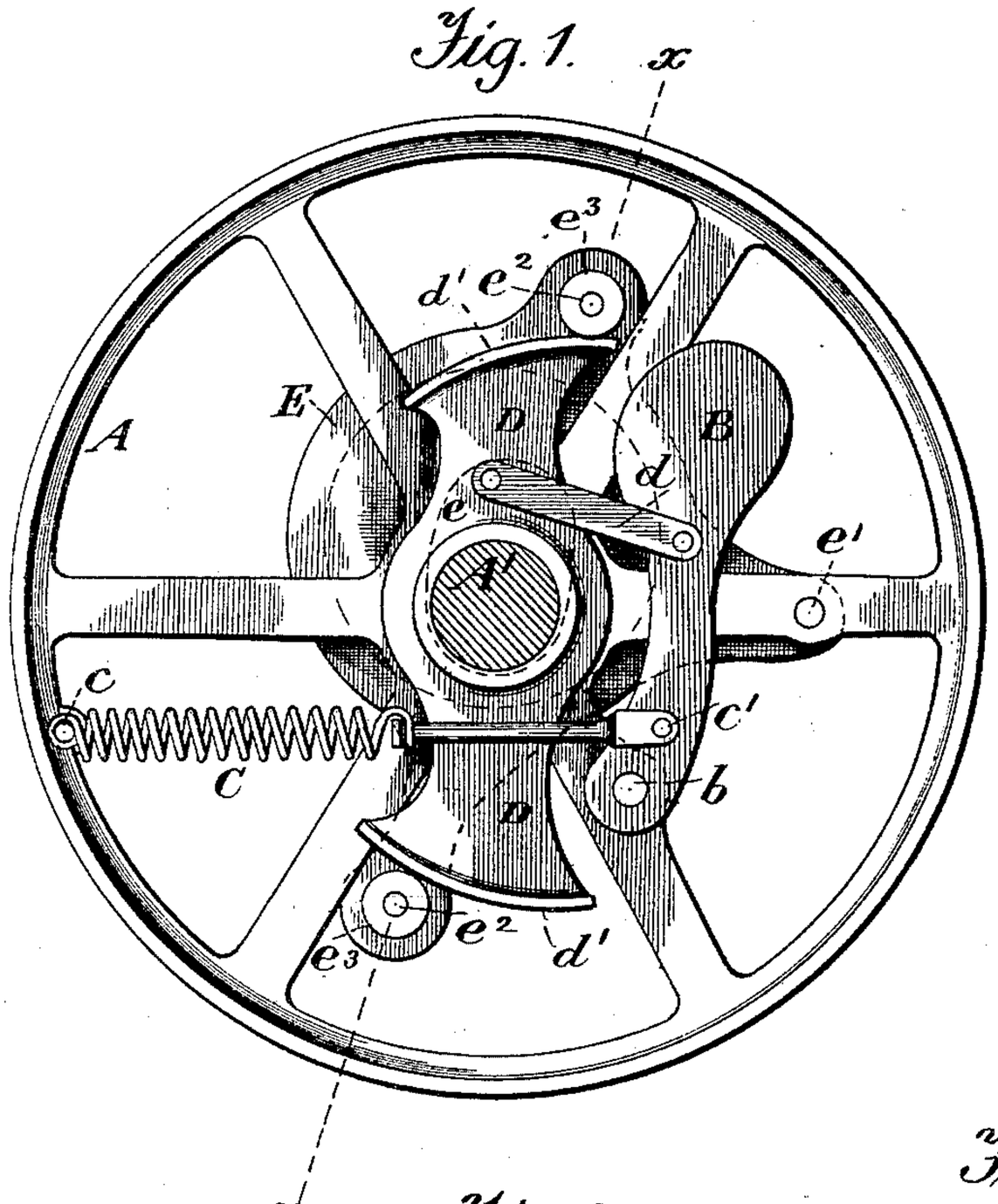


Fig. 2.

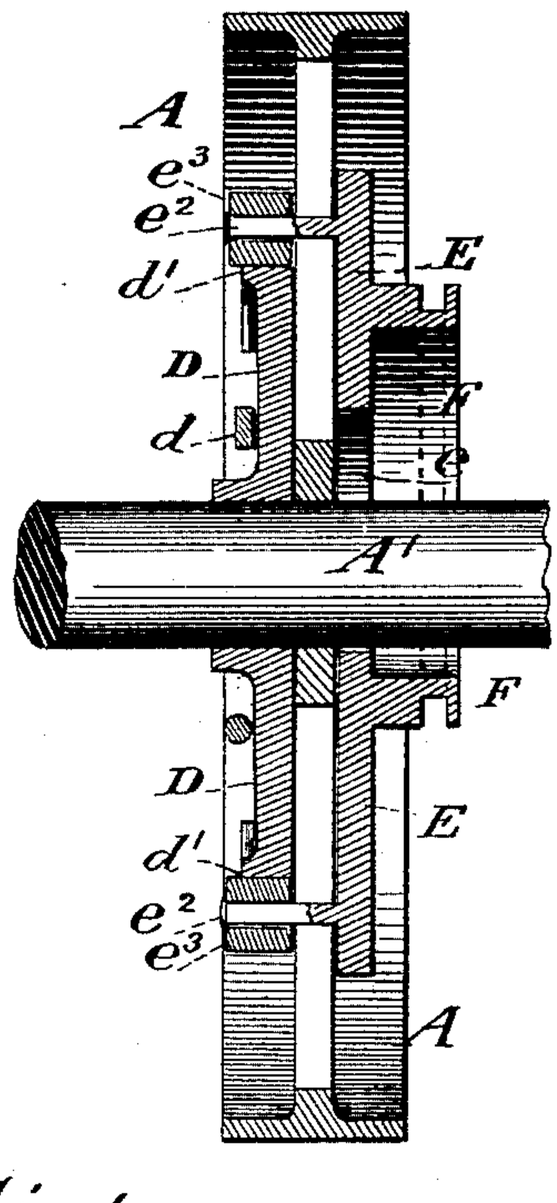


Fig. 3.

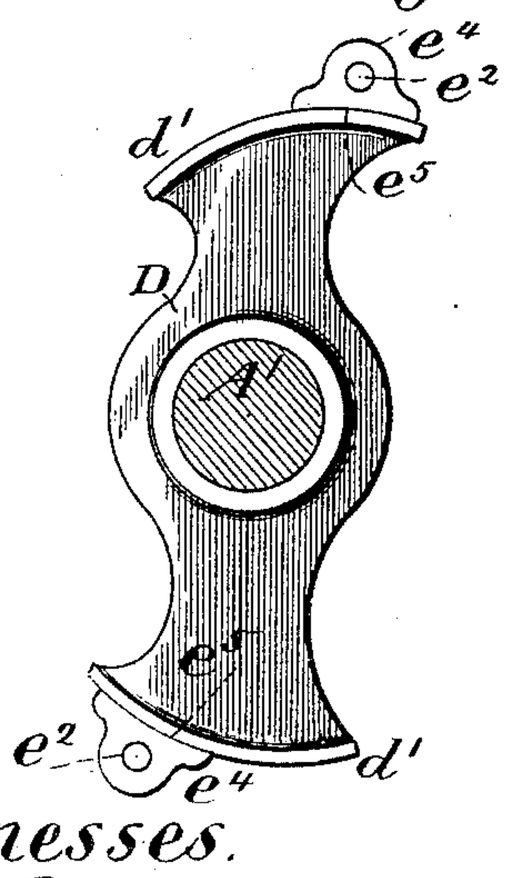
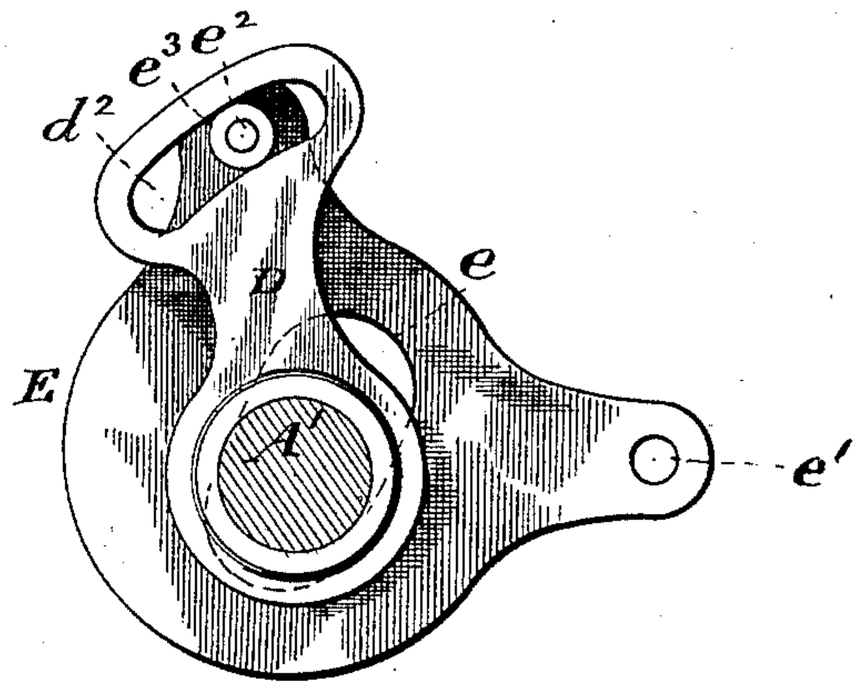


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

ALFRED H. RAYNAL, OF RICHMOND, VIRGINIA.

GOVERNOR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 450,917, dated April 21, 1891.

Application filed January 6, 1890. Serial No. 336,021. (No model.)

To all whom it may concern:

Be it known that I, ALFRED H. RAYNAL, of Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Governors for Steam-Engines, of which the following is a specification, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to that class of governors for steam-engines in which a shifting eccentric is employed, the movement of said eccentric being controlled by a weighted arm movable by centrifugal force and a counterbalancing-spring.

My invention consists in the construction and arrangement of devices hereinafter set forth in the specification and claim.

In the drawings, Figure 1 is a front view, partly in section; Fig. 2, a section through the line $x\,x$ of Fig. 1; and Figs. 3 and 4 are modified details, partly in section.

Similar letters of reference indicate similar parts in the respective figures.

A represents a casing or pulley fastened to the engine-shaft A′.

B is a weighted arm pivoted on the casing at b.

C is a spring, one end of which is secured to the casing at c and the other to the arm B at c', the spring tending to hold the weighted arm toward the center of the casing.

D is a cam-plate rotating loosely around the shaft A′ and connected by the link d to the weighted arm B.

E is the eccentric-plate, provided with an elongated opening e, through which the shaft A′ passes. The plate E is pivoted to the casing A at e', and provided at opposite points with pins e^2, on which rollers e^3 revolve. Instead of the rollers e^3 blocks e^4, having a slightly-curved face e^5, as shown in Fig. 3, may be used. The cam-surfaces d' of the plate D engage the rollers e^3 or the blocks e^4, as the case may be, and as the cam-plate D is turned on the shaft by either the action of the weighted arm B or that of the spring C the plate E will be shifted on the shaft A′ in one of two directions.

The eccentric-plate E is provided with a grooved annulus F, which receives the eccentric-strap connecting with the rod leading, through the intervention of suitable parts, to the valve to be controlled.

Instead of using two rollers e^3 at opposite points on the plate E, I may use only one, as shown in Fig. 4. In this case the cam-plate D is provided with an inclined slot d^2, corresponding with the cam-surfaces d', in which the roller e^3 plays. It is obvious that under these circumstances the cam-plate need be prolonged only in one direction from the shaft.

Having described my invention, I claim—

In a governor for steam-engines, a shaft and a pulley or casing secured thereon, a weighted arm movable by centrifugal force and pivoted on the casing, a counterbalancing tensile spring tending to hold the weighted arm toward the center of the pulley or casing, a cam-plate loosely mounted on the shaft, and a link connecting the cam-plate and the weighted arm, combined with an eccentric-plate pivoted on the pulley or casing and having an elongated opening through which the shaft passes, and provided at opposite points with pins and rollers adapted to revolve on said pins and engage the cam-plate, all constructed, arranged, and operating substantially as set forth.

In testimony whereof I have hereunto set my hand and seal.

ALFRED H. RAYNAL. [L. S.]

Witnesses:
M. F. COX,
C. A. DELANEY.