(No Model.)

F. H. BALL.

STEAM ENGINE GOVERNOR.

No. 454,511. Patented June 23, 1891.

Fig. 1

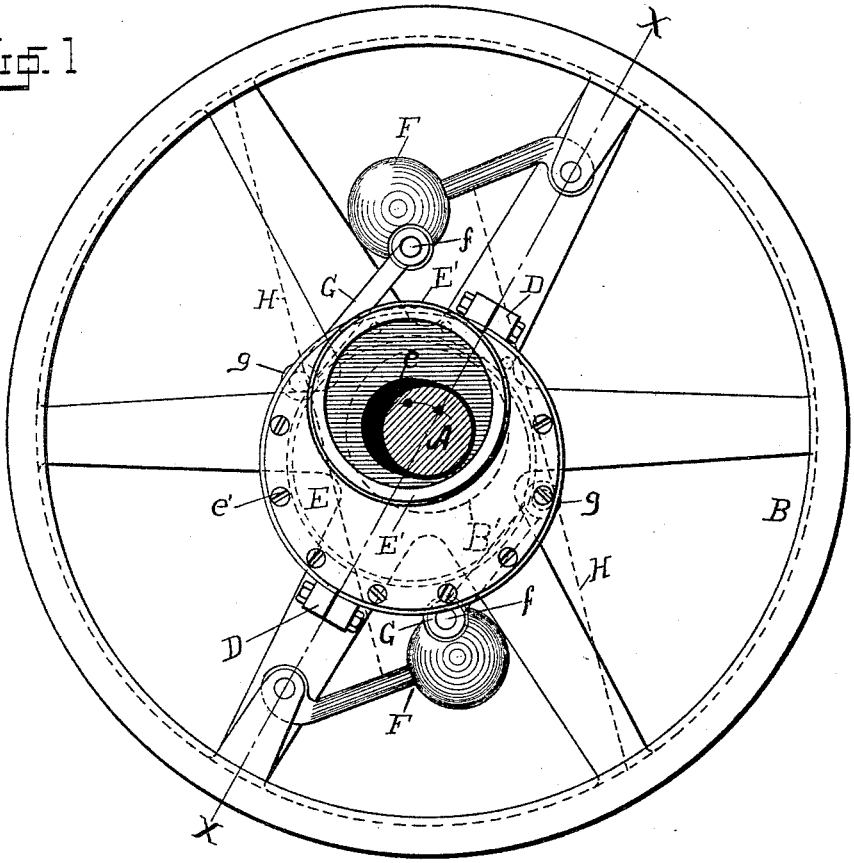
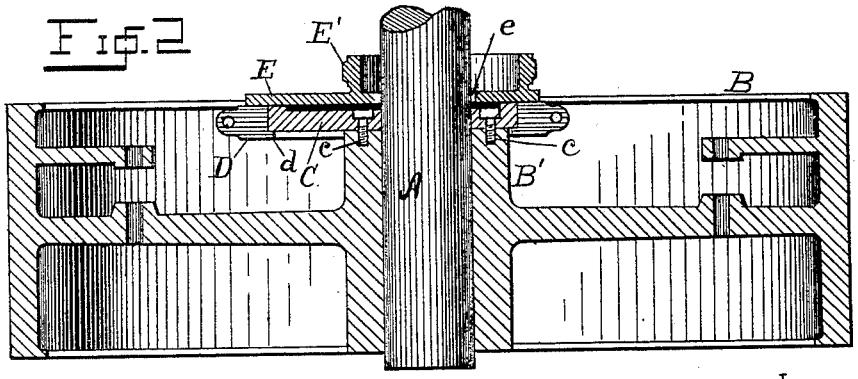


Fig. 2



Witnesses

S. L. Dobbins.

Wm. Marks Jr.

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UNITED STATES PATENT OFFICE.

FRANK. H. BALL, OF ERIE, PENNSYLVANIA.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 454,511, dated June 23, 1891.

Application filed March 31, 1891. Serial No. 387,150. (No model.)

To all whom it may concern:

Be it known that I, FRANK. H. BALL, 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.

This invention relates to that class of steam-engine valve-gears in which the action of the steam-valve is varied by shifting the position of the eccentric which moves it; and it consists in certain improvements in the construction of the same, as will be hereinafter fully set forth, and pointed out in the claim.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 shows the engine-shaft in transverse vertical section and the governor in elevation, looking from the frame of the engine. Fig. 2 shows the wheel B and the governor parts in vertical section on the line *x x* in Fig. 1 and the shaft in elevation.

Only such parts are shown as are necessary to illustrate the invention.

A marks the engine-shaft; B, the fly-wheel or belt-pulley of the engine; F F, the centrifugally-acting weights. The centripetally-acting springs are not shown, the lines H H only marking their position. These common and elementary features of the governor may be of any desired construction, and as they form no part of my invention they require here no detailed description.

C is an eccentric, which may be secured to the hub B′ of the wheel B by screws *c*, as shown, or by any other means, or it may be secured to the shaft A in any manner desired.

D is a collar or strap fitted loosely on the eccentric C. It is held against lateral movement by the lip *d* on one side and a face-plate E on the other side, said face-plate being secured to the collar D by screws *e′*.

E′ is an eccentric which is secured to the face-plate E either by being formed integrally therewith, as shown, or otherwise, as desired. This eccentric embraces the shaft A, and the face-plate is provided with elongated opening *e* to allow the eccentric E′ to move diametrically upon the shaft, which movement will occur whenever the strap D is turned upon the eccentric C, and such movement of the strap will occur whenever the weights F move centrifugally or centripetally, for said weights are connected by links G with said strap, said links being pivoted to the weights at *f* and to the strap D at *g*.

This invention is in the nature of an improvement upon the construction shown in an application filed by me May 16, 1890, and numbered serially 352,031, and consists, essentially, in adapting the valve-gear, there shown as applied at the end of the main shaft, to be applied at any point along the shaft. In the said former construction the face-plate E, which is a counterpart of the face-plate E in this construction, was provided with a crank-pin F, to which the valve-rod was connected, and it necessarily had to be located at the outer end of the shaft and on the outside of the belt-pulley or fly-wheel. In certain designs of engines it is not desirable that the valve-gear be thus located; but it is much preferable that it be located between the belt-pulley and the engine-frame or within the length of the main shaft, and to effect such arrangement of the valve-gear is the object of my invention.

The changes of construction necessary to secure the result desired are to provide the face-plate E with an elongated shaft-opening *e*, and in place of the crank-pin F, used in the former construction, attach to, or built upon, the face-plate the eccentric E′.

What I claim as new is—

In an automatic cut-off-valve gear for steam-engines, the combination, substantially as set forth, of the disk C, secured eccentrically on the shaft A, the yoke D, and face-plate E, concentrically journaled on said disk, said face-plate having an opening *e* therein for the shaft A of sufficiently greater diameter than the shaft to allow of the rotative movement of the said plate concentrically upon said eccentrically-supported disk, the eccentric E′, attached to said plate E and surrounding said shaft-opening *e*, and the fly-balls or weights F, connected with said yoke by the links G.

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

FRANK. H. BALL.

Witnesses:

JNO. K. HALLOCK,

WM. P. HAYES.