(No Model.)

M. M. BARRETT & J. F. DALY.

GOVERNOR FOR GAS ENGINES.

No. 443,064. Patented Dec. 16, 1890.

Fig. 1.

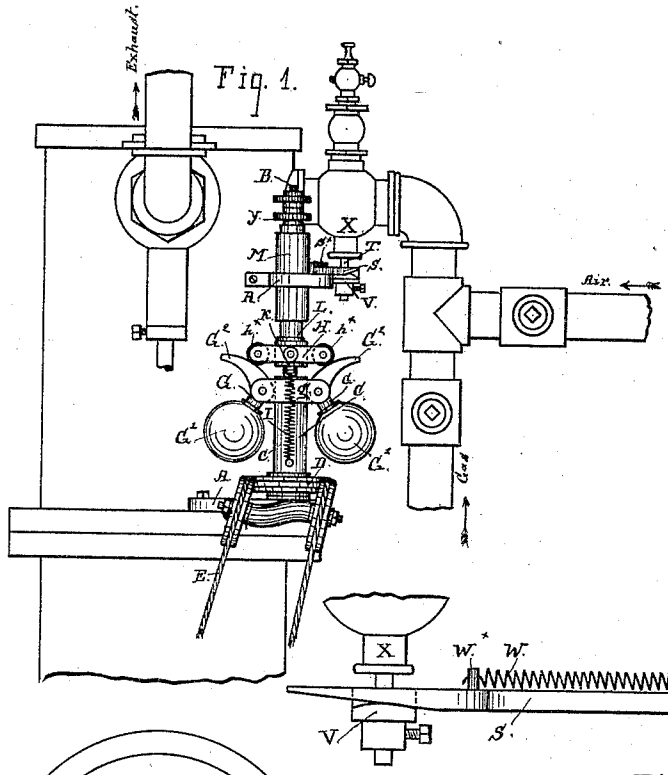


Fig. 2.

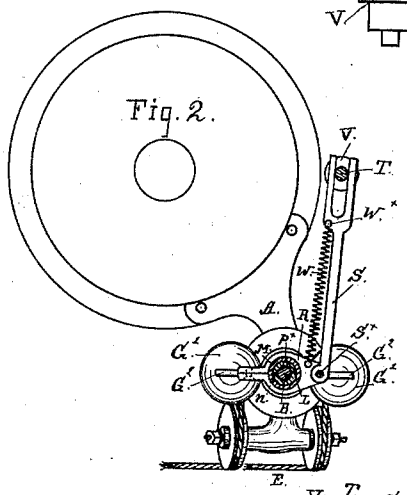


Fig. 3.

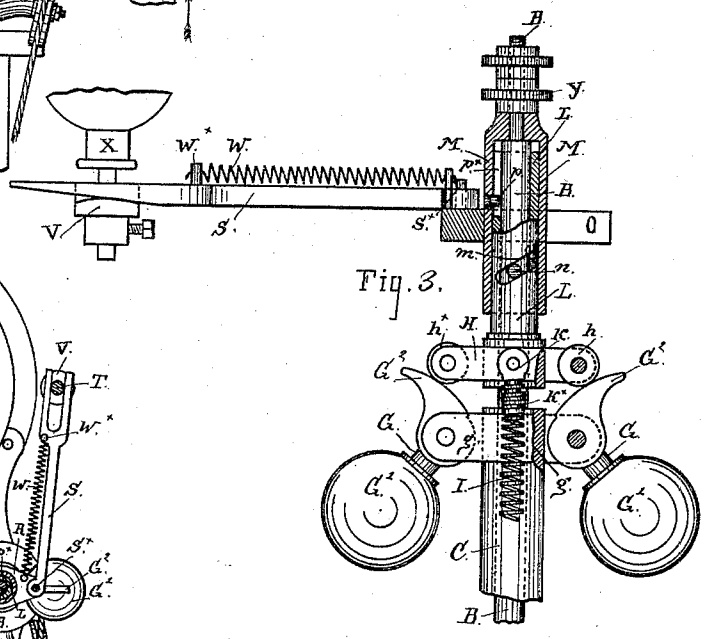
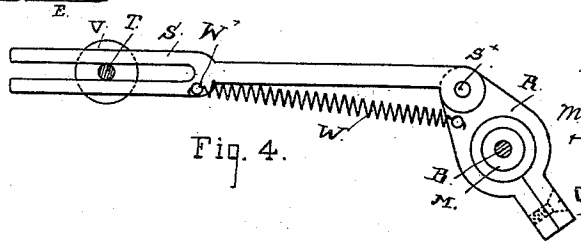


Fig. 4.



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MORA M. BARRETT AND JOHN F. DALY, OF SAN FRANCISCO, CALIFORNIA.

GOVERNOR FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 443,064, dated December 16, 1890.

Application filed May 16, 1890. Serial No. 352,050. (No model.)

To all whom it may concern:

Be it known that we, MORA M. BARRETT and JOHN F. DALY, citizens of the United States, residing in the city and county of San Francisco, and State of California, have invented certain new and useful Improvements in Governors for Gas-Engines, of which the following is a specification.

Our invention relates to the production of a governor or automatic device for regulating the supply of gaseous mixture to the cylinders of gas-engines and other engines of that class in which the motive power is an explosive gas; and it consists in the parts and combination of parts hereinafter described and claimed, producing a governor of great delicacy in operation and of considerable simplicity in construction.

The manner in which we have carried out and produced our invention will be fully understood from the following description, in which the accompanying drawings is referred to by letters.

Figure 1 is a side elevation of the upper end of a gas-engine having our governor applied thereto. Fig. 2 is a plan view of the same, showing the governor-stem and valve-stem in transverse section. Fig. 3 is an enlarged view of the governor detached, showing portions in sections, and also showing a portion of the valve. Fig. 4 is an enlarged plan view of the valve-bar and cross-head, showing the governor-stem and valve-stem in section.

A indicates a bracket-piece or base furnishing a support for an upright rod or post B, having its lower end fixed in the base.

C is a sleeve or tubular piece fitted to revolve freely on a post and carrying on its lower end a sheave or pulley D for a driving-belt E. To this loose sleeve, at or near the top, are attached by hinge or pivot joints g two levers G G, having centrifugal balls G′ on the outer ends and terminating in curved toes or cams G^2 on the inner ends beyond the pivots. Above these curved ends and resting upon them is a cross-bar H, having friction rollers or wheels $h^\times$, that rest upon the ends of the levers, and also fitted loosely on the fixed post to turn freely around it with the sleeve below, but also capable of sliding easily up and down on the post independently of the driven sleeve below it.

I is a coil-spring attached at the lower end to the part C and at the upper end to the cross-bar H. At this last-mentioned point the connection is made by a screw-threaded coupling composed of the two parts k $k^\times$, one part a screw-threaded thimble working over the other part, which is threaded externally. The upper end of the spring is made fast to the tubular piece and the coupling furnishes a means for regulating the tension of the spring, by which the cross-bar is held down against the curved ends of the centrifugal arms with greater or less degree of force.

On the fixed post above the cross-bar is a loosely-fitting sleeve resting on but not attached to the cross-bar, so that while rising and falling on the post under the vertical movements of the cross-bar it does not turn with that piece. This sleeve is in turn surrounded by an outer sleeve or tubular piece M, to which a rotary movement is given in a limited arc upon the inner sleeve without vertical or sliding movement. This circular movement of the outer piece M is produced by the perpendicular sliding movement of the inner piece L through the medium of an inclined slot m on the piece L and a fixed pin n in the post B, the outer sleeve being connected with the piece L by a pin p on the latter, which sets into a groove $p^\times$ in the sleeve L, extending vertically, as shown, and as thus connected the two sleeves must turn together on the fixed post; but the inner sleeve producing such rotary movement has also perpendicular movement on the post that does not affect the outer sleeve in that direction.

R is a cross-head fast on the outer sleeve, and S is a forked bar attached to one end of the cross-head by a pivot-joint $S^\times$, from which point of attachment it extends substantially horizontal to embrace the stem or spindle T of the valve. The forked arms of the bar are wedge shape, with a taper from the point toward the body and with the bottom face inclined; but the top face is level, so that as the bar is set forward between the bottom of the valve-body X, which is a fixed point of bearing, and a collar V on the valve-spindle the lift of the valve will be limited according

to the position of the forked bar. That face of the collar on which the forked arms ride is connected or rounded to bring the bearing-surface close to the center around the valve-spindle. The forked bar is thrown forward or drawn back by rotation of the outer sleeve in one direction or the other, the backward motion being produced by a spiral spring W, that is attached to the cross-head at a point inside of the joint $S^{\times}$ and at the opposite end to the forked bar at $W^{\times}$ to act contrary to the upward movement of the revolving cross-bar, and so keep the foot of the sliding sleeve always against the cross-bar. The outer sleeve is somewhat longer than the inner sleeve, and the cross-head is formed in two parts that clamp the sleeve near the top.

After the parts are slipped into place on the post the upper sleeve is kept down by a nut *y* taking on the screw-threaded end of the fixed post.

The operation of these parts as thus constructed and combined will be well understood without special description. The position of the parts of the governor when the valve has full throw is shown in Figs. 2 and 3. With an increase in speed the centrifugal arms raise the revolving cross-bar, and through the action of the other parts the forked piece is thrown forward, as illustrated in Fig. 4.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The herein-described governor, comprising the driven sleeve mounted on a stationary post having rotation without longitudinal movement, the centrifugal arms pivoted to said sleeve and having curved inner ends extending beyond the pivots, a cross-bar bearing upon said curved ends and having both rotation and longitudinal movement, a loose sleeve resting upon said cross-bar but not rotating with it, a fixed pin on the stationary post and an inclined slot in the loose sleeve as means by which partial rotation of the sleeve is produced when the sleeve is moved longitudinally, an outer sleeve having partial rotation with the said sleeve, but not longitudinal movement, a cross-bar secured on said outer sleeve, a wedge-shaped bar pivoted to said cross-head and having its wedge-shaped portion set between a fixed post or shoulder around the stem or rod of a valve to be controlled, a collar on said valve-rod, and a spring attached to the cross-head and the wedge-shaped bar to draw them into angular position for operation, as set forth.

2. In an engine-governor, the combination of the driven sleeve C, mounted on a fixed post and having centrifugal arms G, with curved toes G^2, the revolving cross-bar H, having also longitudinal movement by which rotation of a part above it is produced, and the adjustable spring I, attached to the said cross-bar and to a fixed point on the driven sleeve, substantially as described.

3. In an engine-governor, the combination, with the driven sleeve and the revolving cross-bar, of the two-part rotating sleeve, the inner part of which has longitudinal movement and partial rotation produced by the upward movement of the revolving cross-bar, and the outer part of which has rotation with the said inner part without longitudinal movement, substantially as described.

4. In an engine-governor, the combination, with the rotating sleeve M, of the cross-head R, fixed thereon, the wedge-shaped slide-bar S, pivoted to said cross-head, and the spring W, substantially as described.

5. In combination with the stem or rod of a valve to be controlled, the collar V on the rod, the wedge-shaped slide-bar S, a loosely-turning sleeve M, having a cross-head, to which the said slide-bar is connected, a driven sleeve carrying and giving motion to centrifugal arms, means whereby the angular movement of said arms is caused to turn or rotate said cross-head-carrying sleeve in one direction, and a spring W, applied to act upon said slide-bar in a direction contrary to that produced by the centrifugal arms, substantially as described.

In testimony that we claim the foregoing we have hereunto set our hands and seals.

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JOHN F. DALY. [L. S.]

Witnesses:
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