

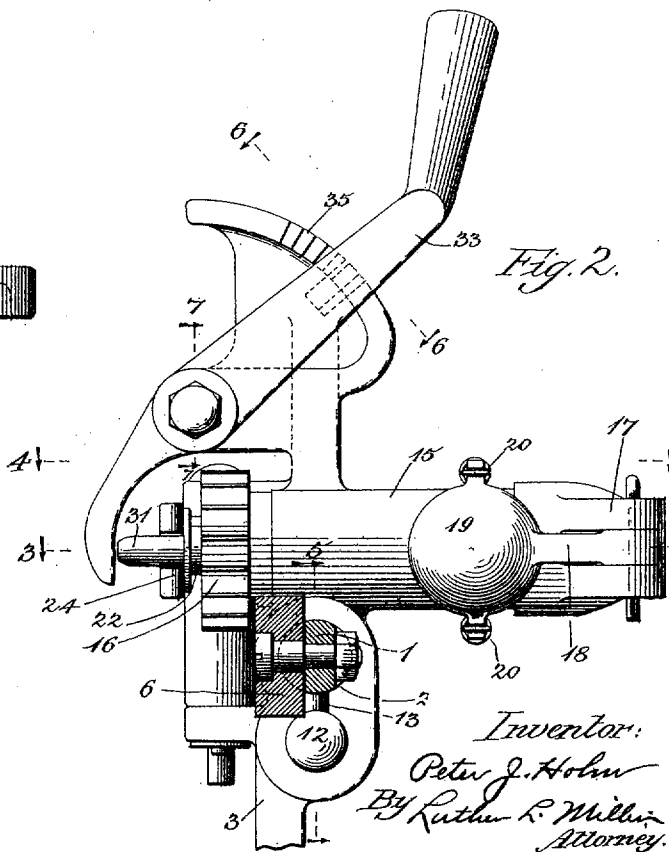
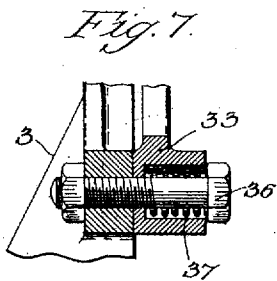
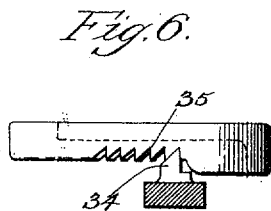
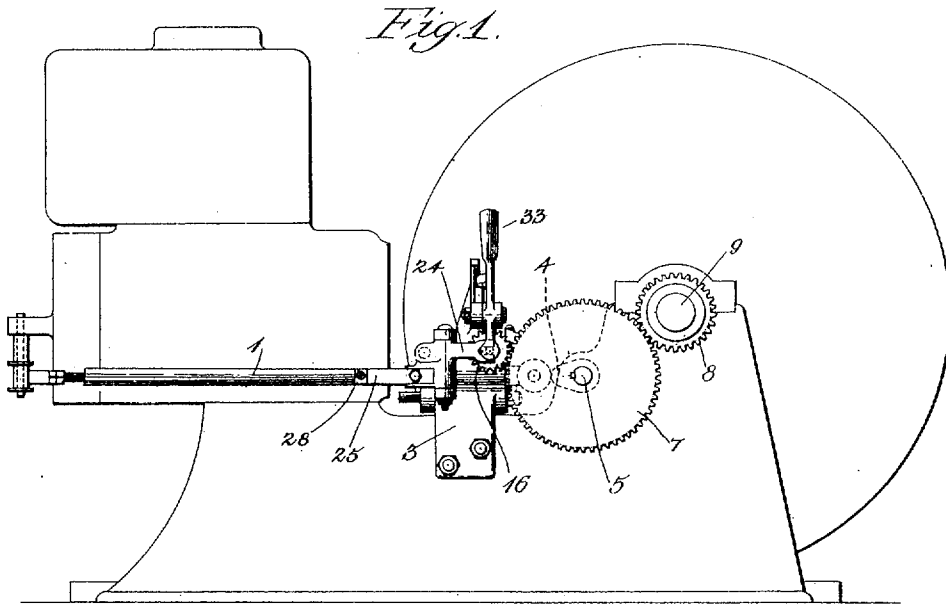
P. J. HOLM.
GOVERNOR.

APPLICATION FILED JULY 16, 1909.

973,505.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.



Witnesses:

J. C. Devick.

George L. Chundahl.

Inventor:

Peter J. Holm

By Luther R. Miller
Attorney.

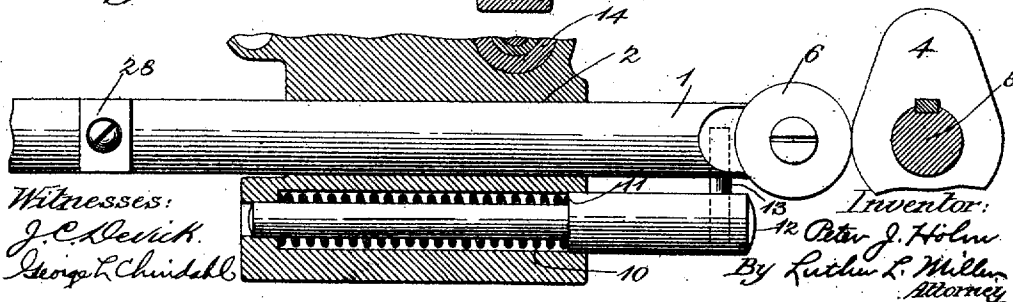
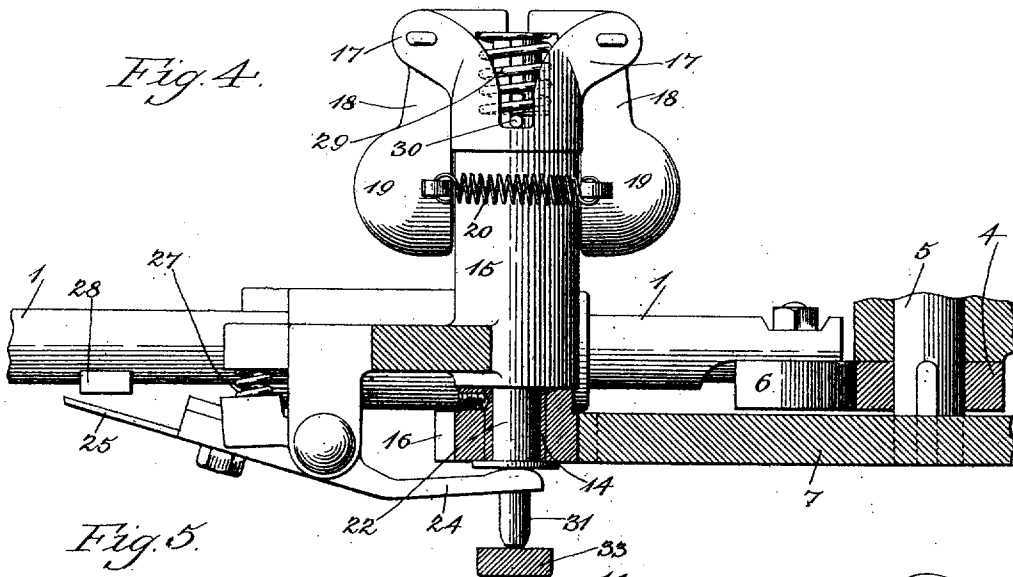
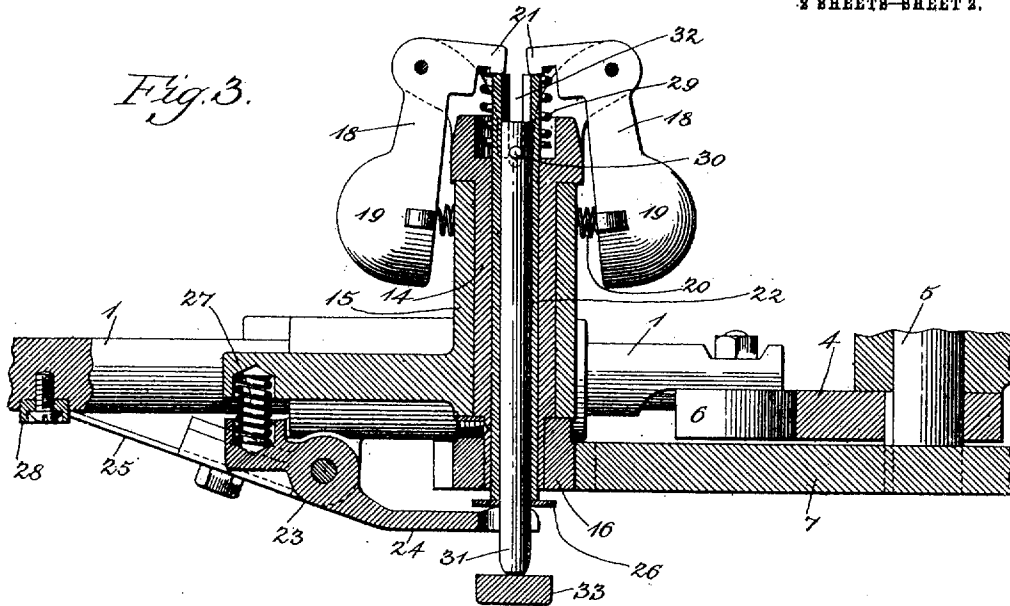
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2 SHEETS-SHEET 2.



Witnesses:
J. C. Berwick.
George L. Chindahl.

Inventor:
Peter J. Holm.
By Luther L. Miller
Attorney

UNITED STATES PATENT OFFICE.

PETER J. HOLM, OF SPARTA, MICHIGAN, ASSIGNOR TO HOLM'S MACHINE MANUFACTURING COMPANY, OF SPARTA, MICHIGAN, A CORPORATION OF MICHIGAN.

GOVERNOR.

973,505.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed July 16, 1909. Serial No. 507,904.

To all whom it may concern:

Be it known that I, PETER J. HOLM, a citizen of the United States, residing at Sparta, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Governors, of which the following is a specification.

The object of this invention is to produce an improved governor especially applicable to internal combustion engines.

In the accompanying drawings, Figure 1 is a side elevation of an engine equipped with a governor embodying the features of my invention. Fig. 2 is an elevation of the governing mechanism. Fig. 3 is a horizontal sectional view taken in the plane of dotted line 3 of Fig. 2. Fig. 4 is a horizontal section on line 4 of Fig. 2. Fig. 5 is a vertical section on line 5 of Fig. 2. Figs. 6 and 7 are sectional details on lines 6 6 and 7 7, respectively, of Fig. 2.

In the embodiment selected for illustration, the governing action is exerted upon a reciprocatory rod 1 which may be arranged to operate an exhaust valve or an igniter, or both. The rod 1 is slidably mounted in an opening 2 (Fig. 5) formed in a bracket 3 which is rigidly secured to the engine frame. The rod 1 may be reciprocated by any suitable means. It is herein shown as moved in one direction by a cam 4 fixed upon a shaft 5 and engaging an antifriction roll 6 carried by said rod. Fixed to the shaft 5 is a spur gear wheel 7 which meshes with a pinion 8 on the crank shaft 9. The rod 1 is moved in the opposite direction by a spring 10 (Fig. 5) lying within an opening in the bracket 3 and bearing against a shoulder 11 on a plunger 12 which is slidable in said bracket. One end of the plunger 12 is fixed to the rod 1 by means of a pin 13.

The governor mechanism comprises a shaft 14 which is rotatably mounted in a bearing 15 on the bracket 3. The governor shaft 14 may be rotated by any suitable means, as, for example, a pinion 16 fixed on said shaft and meshing with the spur gear wheel 7. On one end of the governor shaft is a yoke 17 in which are pivotally mounted two arms 18 having weights 19 thereon. One or more springs 20 are employed to resist the tendency of the weighted arms 18 to swing outwardly as the shaft 14 is rotated.

Angular fingers 21 on the arms 18 are ar-

ranged to bear upon one end of a rod 22 which is longitudinally slidable in an axial opening in the governor shaft 14. The opposite end of said rod bears against a lever 23 comprising the arms 24 and 25, said lever being pivotally mounted upon the bracket 3. If desired, a washer 26 may be interposed between the end of the rod 22 and the arm 24. A spring 27 tends to rock the lever 23 and presses the end of the arm 24 against the rod 22. The arm 25 of the lever 23 is arranged to be placed in the path of a projection 28 fixed upon the rod 1.

It will be seen that as the governor shaft 14 is rotated, the weighted arms 18 will swing outwardly, thereby sliding the rod 22 and rocking the lever 23 to place the arm 25 in the path of the projection 28. The reciprocatory movement of rod 1 will thereby be limited so as to prevent the normal operation of the exhaust valve or the igniter, or both, thus reducing the speed of the engine. As the speed is reduced, the weighted arms 18 are drawn toward each other by the springs 20, thereby permitting the spring 27 to withdraw the arm 25 from the path of the projection 28. The rod 1 will then be permitted to resume its normal operation.

I have provided means for adjusting or altering the resistance of the weighted arms 18 to outward movement, which means is herein shown as comprising a spring 29 which bears at one end against the fingers 21 and at its other end against a pin 30 fixed in a rod 31, which rod is longitudinally slidable within an axial opening in the rod 22. The rod 22 is slotted as at 32 to accommodate the pin 30. In this instance the ends of the pin 30 extend between the arms of the yoke 17, so that the rods 22 and 31 rotate with the governor shaft.

The means for sliding the rod 31 to increase the tension of the spring 29 comprises, in this instance, a hand lever 33 pivotally mounted upon the bracket 3 and arranged to bear at its lower end upon one end of the rod 31. The upper end of the hand lever carries a tooth 34 (Fig. 6) which is adapted to engage with a locking sector 35 for releasably locking the hand lever in adjusted position. The tooth 34 may be withdrawn from the sector by a lateral movement of the hand lever. To permit of such lateral movement, I have herein shown the

lever as loosely mounted upon a pivot bolt 36 and pressed toward the bracket 3 by a coiled spring 37.

When the the speed of the engine is to be increased, the hand lever 33 is swung to the left (Fig. 2), thereby compressing the spring 29 and augmenting the resistance of the weighted arms 18 to the tendency to separating movement due to centrifugal force. The engine may now reach a higher speed before the governor will operate the lever 23 to interfere with the action of the rod 1.

When the speed of the engine is to be reduced, the hand lever 33 is swung to the right (Fig. 2) to lessen the tension of the spring 29, whereupon the governor will act more quickly to control the movements of the rod 1.

I claim as my invention:

1. In an internal combustion engine, the combination of a reciprocatory member and a governor mechanism for controlling the movements of said member, said governor mechanism comprising a rotatory governor shaft, weighted arms carried by said shaft, a longitudinally slidable rod extending through said shaft and arranged to be moved by said weighted arms, a lever arranged to be rocked by said rod to interfere with the movements of said reciprocatory member, a spring arranged to act upon said weighted arms, a rod extending through the other rod and affording an abutment for said spring, and means for adjusting the position of the second mentioned rod.

2. In an internal combustion engine, the combination of a rotatory governor shaft, weighted arms carried by said shaft and provided with angular fingers, a longitudinally slidable rod extending axially through

said shaft and arranged to be moved by said fingers, a controlling element movable by said rod, a spring bearing upon said fingers, a rod slidable axially in the first mentioned rod and affording an abutment for said spring, a hand lever for longitudinally sliding the second mentioned rod, and means for locking said hand lever in adjusted position.

3. In an internal combustion engine, the combination of a reciprocatory member and a governor mechanism for controlling the movements of said member, said governor mechanism comprising a rotatory governor shaft, weighted arms carried by said shaft and provided with angular fingers, a longitudinally slidable rod extending axially through said shaft and arranged to be moved by said fingers, a two-arm lever, one arm of which lever is arranged to be moved by said rod, a projection on said reciprocatory member into the path of which projection the other lever-arm is arranged to be placed when said lever is rocked by said rod, a spring tending to rock said lever to withdraw the second mentioned lever-arm from the path of said projection, a spring bearing upon said fingers, a rod slidable axially within the first mentioned rod and affording an abutment for the last mentioned spring, a hand lever bearing against the second mentioned rod for sliding it to compress the second mentioned spring, and means for locking said hand lever in adjusted position.

PETER J. HOLM.

Witnesses:

B. N. KEISTER,
O. E. WALCOTT.