P. J. HOLM, DEC'D.

J. H. & C. C. HOLM, EXECUTORS.

GOVERNOR FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JAN. 27, 1911.

1,015,889. **Patented Jan. 30, 1912.**

2 SHEETS—SHEET 1.

Fig. 1.

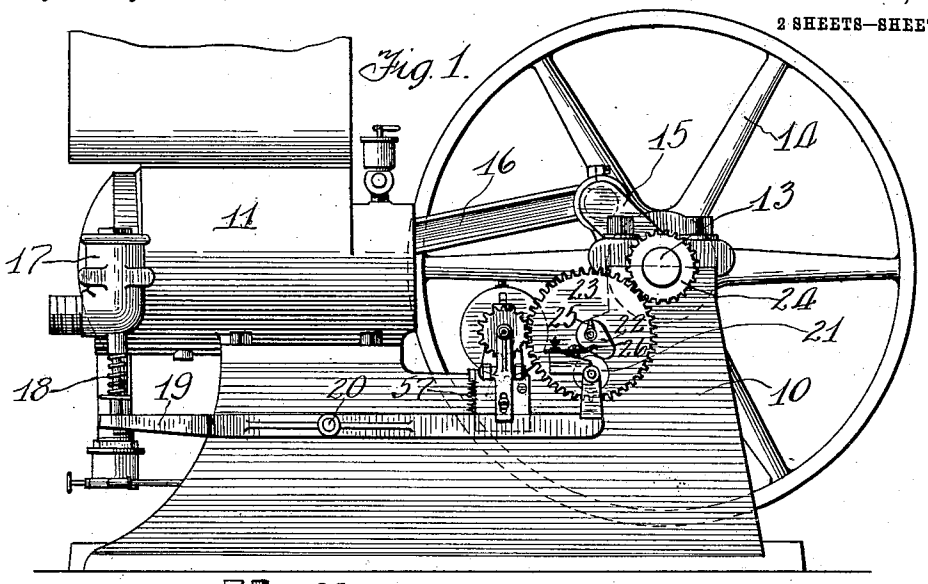
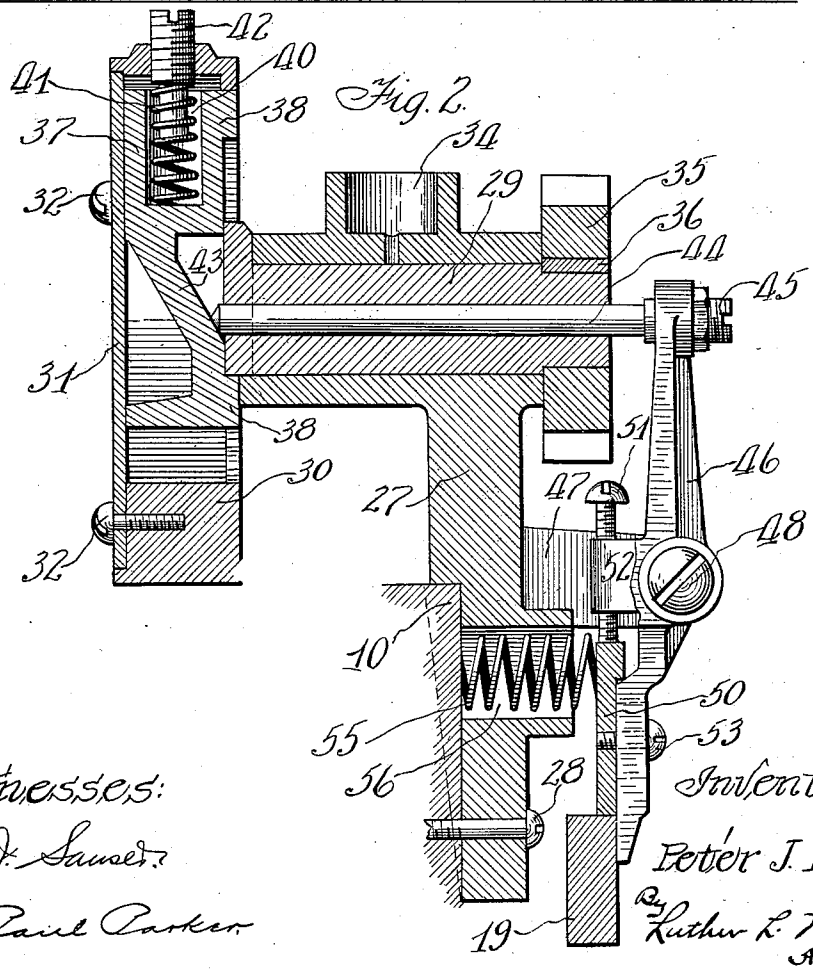


Fig. 2.



Witnesses:

A. J. Sawyer

C. Paul Parker

Inventor:

Peter J. Holm,

By Luther L. Miller

Atty.

P. J. HOLM, DEC'D.

J. H. & C. C. HOLM, EXECUTORS.

GOVERNOR FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JAN. 27, 1911.

1,015,889.

Patented Jan. 30, 1912.

2 SHEETS—SHEET 2.

Fig. 3.

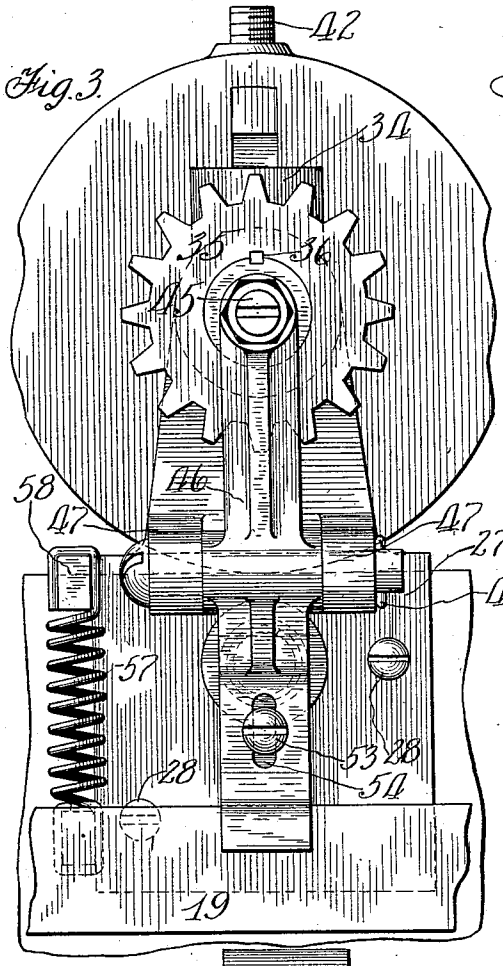


Fig. 4.

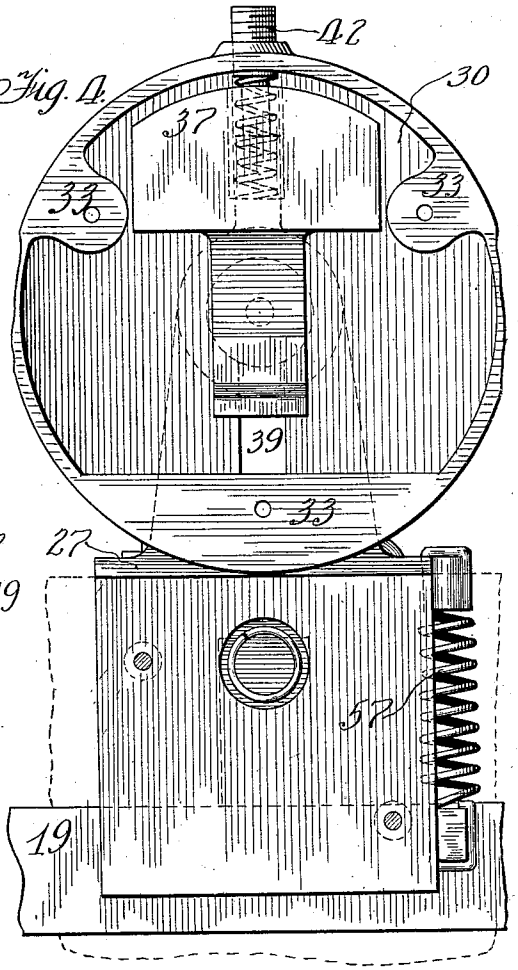
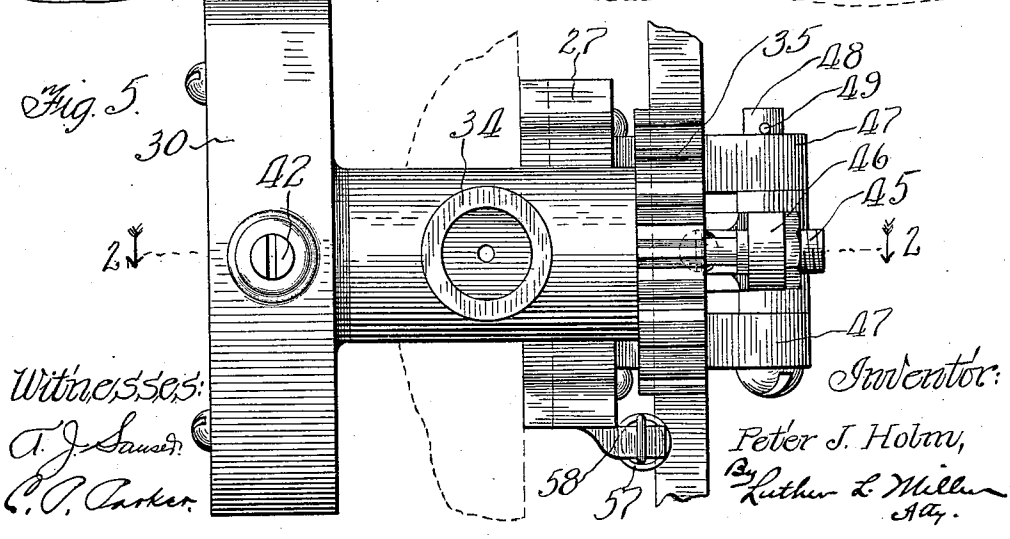


Fig. 5.



Witnesses:
C. J. Sauer.
C. O. Parker.

Inventor:
Peter J. Holm,
By Luther L. Miller
Atty.

UNITED STATES PATENT OFFICE.

PETER J. HOLM, OF EAU CLAIRE, WISCONSIN; JOHN H. HOLM AND CHARLOTTE C. HOLM, OF EAU CLAIRE, WISCONSIN, EXECUTORS OF SAID PETER J. HOLM, DECEASED.

GOVERNOR FOR INTERNAL-COMBUSTION ENGINES.

1,015,889. Specification of Letters Patent. Patented Jan. 30, 1912.

Application filed January 27, 1911. Serial No. 604,952.

To all whom it may concern:

Be it known that I, PETER J. HOLM, a citizen of the United States, residing at Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented certain new and useful Improvements in Governors for Internal-Combustion Engines, of which the following is a specification.

The present invention relates to governors for internal combustion engines. In engines of this type, a movable member is provided for coöperation with other parts to control combustion in the engine cylinder, in some forms by controlling the exhaust valve, in others the igniter, and in still other forms, both the exhaust valve and the igniter. This movable member is actuated from the engine shaft during normal speeds of the engine, but is held from normal operation through the agency of the governor mechanism whenever the speed becomes excessive.

The present invention has to do with this governor mechanism and it has for its object the provision of a governor which is simple in construction, positive and sensitive in action, readily adjustable to give different speeds and to take up the natural wear of the parts, which is dust proof, and applicable to engines in which the movable member is either pivoted or slidable.

The character of the invention will be understood from the following detailed description taken in connection with the accompanying drawings, and its scope will be particularly pointed out in the appended claims.

In the drawing, Figure 1 illustrates an engine of the type in question, having a governor constructed in accordance with the present invention; Fig. 2 is a vertical section of the governor taken on a plane indicated by the line 2—2 of Fig. 5; Fig. 3 is an end elevation of the same, as viewed in Fig. 1; Fig. 4 is an elevation viewing the governor from the end opposite to that viewed in Fig. 3 and having the cover plate of the governor casing removed; and Fig. 5 is a plan view of the governor.

Throughout these figures, like characters refer to like parts.

Referring to the drawing in detail, and more particularly for the present, to Fig. 1, 10 designates the engine base to which the cylinder 11 is secured and upon which the engine shaft 13 is journaled. This shaft is provided with a fly-wheel 14 and a crank 15. The crank is connected by a connecting rod 16 to a piston operating within the cylinder 11. The fuel supply to the cylinder is controlled in the usual manner and its exhaust is controlled by an exhaust valve in the exhaust valve chamber 17. This valve is in turn controlled by a spring 18 and a movable member 19. In the form of the invention illustrated herein, this member 19 is a lever pivoted at an intermediate point 20 to the base 10 of the engine. This member 19 is provided with an upturned end in which is journaled a roller 21, upon which a cam 22 operates as the engine is in motion. The cam 22 rotates with the gear-wheel 23, which is in mesh with a pinion 24 mounted upon the shaft 13. The shaft which carries the cam 22, also carries a terminal 25 which coöperates with a resilient terminal 26 to close a circuit for the igniter by which the charge in the engine cylinder is exploded. From the description thus far, it will be seen that, as the engine shaft 13 is rotated, the movable member 19 is oscillated to actuate the exhaust valve in the chamber 17, and the circuit is closed for the igniter at the proper times. This much describes one type of engine to which my invention is applicable. In applying my improved type of governor to this type of engine, I preferably mount the several parts upon a bracket 27, suitably supported upon the engine base 10. In the present instance, the bracket is shown attached to the engine base by means of screws 28. This bracket is broadened out at its upper end so as to form a bearing for the stem 29 of the governor body, which includes a casing formed by the head 30 and the removable cover 31. This cover is preferably secured in place by screws 32 threading into lugs 33, as clearly illustrated in Fig. 4. The upper portion of the bracket 27 is provided with an oil or grease cup 34. The governor body, comprising the stem 29, the head 30 and the cover 31, is rotated through the agency of a gear-wheel 35, keyed to the end of the stem 29 by a key 36. This gear-wheel is adapted to mesh with the gear-wheel 23 by which the cam 22 is actuated and consequently the governor body rotates whenever the engine shaft

13 is rotated. The casing formed by the head 30 and the cover 31 incloses a centrifugal weight 37, which is guided through the agency of projections 38 extending from it into a slot 39 formed in the head 30. As illustrated in Fig. 2, this centrifugal weight is in its extreme outer position. It is brought to this position, as is well known, by the centrifugal force acting upon it as a result of the rotation of the parts. This weight 32 is provided with a socket 40 into which extends a coiled compression spring 41. This spring acts between the bottom of the socket 40 and an adjustable screw 42, threaded into the periphery of the head 30 in line with the slot 39. This screw 42 is reduced at its inner end so as to form a guide for the spring 41. The weight 37 is provided at a point near the axis of rotation of the parts with an inclined face 43 which operates upon the inward and outward movement of the weight to reciprocate a longitudinally movable rod 44, which extends through a suitable opening in the center of the stem 29. This rod engages, at its opposite end, with one end of an adjustable screw 45 threaded into one end of the latch lever 46, which is pivoted at an intermediate point to lugs 47 extending outward from the bracket 27, by means of a pivot 48, suitably held in place by a cotter-pin 49, or other suitable means. By adjusting the screw 45, the relative positions of the rod 44 and the latch lever 46 can be determined. This latch lever is the one which controls the reciprocatory member 19 and it has at its lower end a wear-plate 50 of steel or other suitable material, which may be adjusted in position initially, and to take up wear, by means of an adjusting screw 51, threaded through a lug 52 on lever 46 and held in such adjusted position by tightening screw 53 extending through a slot 54 in the adjacent portion of the lever 46. A coiled compression spring 55 tends to force the latch lever 46 out of a position in which it would engage the movable member 19. As illustrated, it is contained in a suitable opening 56 in bracket 27 and acts between the engine base 10 and the wear-plate 50. A tension spring 57, illustrated in Figs. 1, 3 and 4 co-acts between a fixed lug 58 on the bracket 27 and the reciprocatory member 19 to maintain the cam roller 21 in engagement with the cam 22.

In normal operation, the latch member 46 does not engage the movable member 19, but the latter is free to perform its accustomed functions. During such operation, the centrifugal weight 37 would not be moved far enough outward to actuate the rod 44 sufficiently to bring the latch lever 46 into a position to engage member 19. However, it will be apparent that if the speed of the engine increases beyond that for which the various parts have been set, the inclined face 43 of the weight 37 will, by reason of the outward movement of the weight, force rod 44 against the adjacent end of the lever 46 to bring its opposite end into a position to engage the movable member 19, thereby causing said lever to discontinue its normal functions and to bring about those changes, such as the opening of the exhaust valve, which will cause the engine to reduce its speed. As the speed is caused thus to drop off, the weight 37 will move inward under the tension of the spring 41 and the rod 44 and latch lever 46 will be free to move under the action of spring 55 so as to bring the lever 46 out of operative relation with the member 19.

In carrying out my invention, it will be apparent, as before indicated, that it may be modified to apply to engines in which the movable member 19 is not a lever, as illustrated, but is of the push-rod or reciprocating rod type, such as is illustrated, for example, in my prior Patent, No. 973,505, granted October 25, 1910. It will also be apparent that many alterations and modifications may be made in the structure without departing from the spirit and scope of my invention. I therefore do not wish to be limited to the precise matter illustrated, but aim to cover such alterations and modifications by the terms of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a governor for internal combustion engines, a rotary device, a centrifugal weight slidable thereon transversely of the axis of said device, a cam surface on said weight at the center of said device, a slidable rod positioned concentrically within said rotary device and arranged to be directly engaged and moved by said cam surface, and a locking means operable by said rod.

2. A governor for an internal combustion engine having a movable control member, including a latch for holding said member against normal operation, a rotary governor body consisting of a journaled stem and an enlarged casing at one end of said stem, a longitudinally movable rod extending through said stem and operative to move said latch into holding position, and a weight in said casing slidable therein under centrifugal action and having an inclined face operative to directly engage said rod to move it.

3. A governor for an internal combustion engine having a movable control member, including a latch for holding said member against normal operation, a rotary governor body consisting of a journaled stem and an enlarged casing at one end of said stem, a longitudinally movable rod extending through said stem and operative to move

said latch into holding position, a weight in said casing slidable therein under centrifugal action and having an inclined face positioned at the center of said casing and adapted to directly engage said rod to move it, and an adjustable spring for resisting the outward movement of said weight.

4. A governor for an internal combustion engine having a movable control member, including a bracket secured to the engine base, a latch lever pivoted to said bracket and operative to engage said control member to hold it against normal operation, an adjustable wear-plate on said latch lever for taking up the wear between it and said movable control member, a governor body consisting of a casing and a stem journaled in said bracket, a longitudinally movable rod extending through said stem into operative relation to said latch lever, an adjustable screw in said lever in line with said rod, a coiled spring normally operative to hold said latch lever in its non-engaging position, a centrifugal weight slidably mounted in said casing and having an inclined face positioned so as to engage one end of said rod and shift it longitudinally against said latch lever when said weight moves outward, and an adjustable spring acting between said casing and said weight to resist its outward movement.

5. In a governor for internal combustion engines, a bearing, a governor casing comprising a stem rotatably mounted in said bearing and a housing at one end of said stem, a weight slidable transversely in said housing and adapted to be moved by centrifugal force, an adjustable spring resisting such movement of said weight, a cam face movable with said weight and positioned at the center of said housing, and a rod positioned concentrically within said stem, one end of said rod being arranged to be engaged and moved by said cam face.

6. In a governor for internal combustion engines, a bearing, a stem rotatably mounted in said bearing, a housing fixed on one end of said stem, a weight slidable under the action of centrifugal force transversely within said housing, a cam surface movable with said weight, a rod positioned concentrically within said stem and having one end adapted to be engaged and moved by said cam surface, and means tending to hold said rod in engagement with said cam surface.

7. In a governor for internal combustion engines, a bearing, a stem rotatably mounted in said bearing, a housing at one end of said stem, a rod positioned concentrically within said stem and slidable therein, a weight slidable transversely in said housing and arranged to be moved by centrifugal force, a cam surface on said weight arranged to engage said rod and move it, a spring acting between said casing and said weight to resist movement of said weight, and means for adjusting the tension of said spring.

8. In a governor for internal combustion engines, a bearing, a stem rotatably mounted therein, a rod positioned concentrically within said stem and slidable therein, an enlarged head on one end of said stem, said head having slots therein, a weight having lugs guided in said slots, said weight being slidable under the action of centrifugal force transversely of the axis of the device, a cover plate holding said weight in place, a cam surface on said weight adapted to engage one end of said rod to slide it, a spring acting between said head and said weight to resist centrifugal movement of said weight, and a screw mounted in said head and adapted to adjust the tension of said spring.

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

PETER J. HOLM.

Witnesses:
E. J. LENMARK,
W. WOODRUFF.