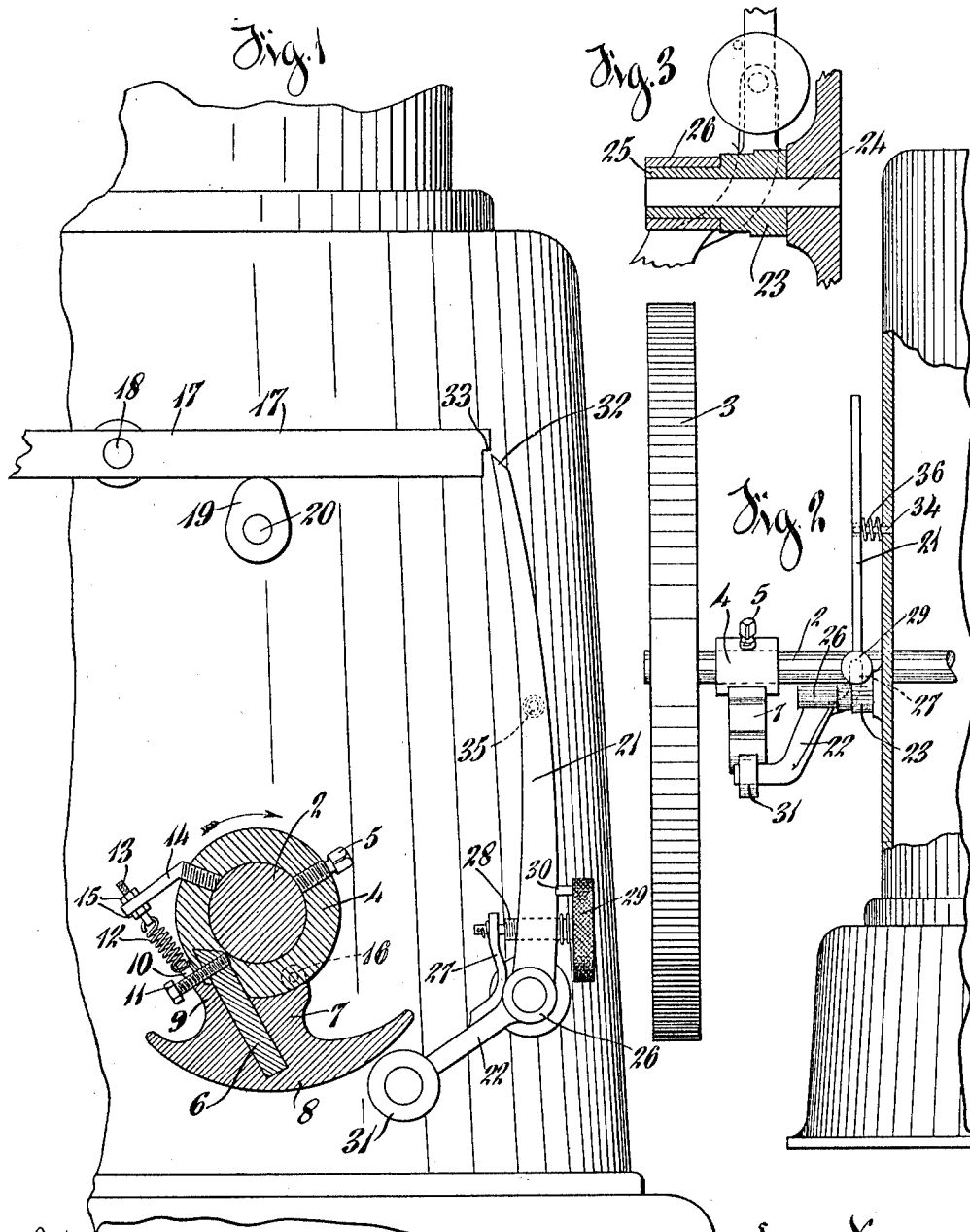


J. W. BENTLER.
GAS ENGINE GOVERNOR.
APPLICATION FILED NOV. 6, 1909.

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Patented Aug. 29, 1911.



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GAS-ENGINE GOVERNOR.

1,001,607.

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To all whom it may concern:

Be it known that I, JOHN W. BENTLER, a citizen of the United States, and residing in Erlanger, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Gas-Engine Governors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to provide a simple, cheap and effective governor for internal combustion engines, comprising a minimum number of parts and which can be readily and easily applied to the various constructions of engines, and in which the engine speed can be effectually and correctly regulated within very narrow limits.

The invention consists of the certain novel constructions and arrangements of parts hereinafter pointed out.

In the drawings,—Figure 1 is a side elevation partly in cross section of my improved governor mechanism. Fig. 2 is a front elevation of the same. Fig. 3 is a longitudinal section in detail of the pivotal portion of the detent lever.

1 is a portion of the engine casing in a gas engine. 2 is the main driving shaft with fly-wheel 3. Mounted on the driving shaft 2 is a collar 4, held in any desired position by the set screw 5.

6 is a stud mounted in the collar 4, preferably at an angle to the radial lines of the collar and tangentially of the cylindrical surface. On this stud is mounted a weight 7, the stud being inserted in the socket in the weight, so as to be free to move on the stud within certain fixed limits. The weight 7 is provided with a segmental contact surface 8, preferably extended to include about a quadrant of a circle. The heel 9 of the weight is provided with a slot 10 through which passes a pin 11, by means of which pin the stud 6 is secured to the collar 4.

It will be evident from this construction, that the play of the weight on the stud 6 will be limited by the slot and pin construction.

Hooked over the heel of the weight at the base of the slot 10 is an expansion coil spring 12, which is secured at its opposite end to the screw 13, mounted in the plate 14 secured to the collar, the screw being adjustable to give proper tension to the spring 12 by the nuts 15, 15.

It will be evident that as the driving shaft is rotated, the weight will tend to slide outwardly on the stud 6, and the purpose of mounting the stud 6 in a tangential relation to the shaft is to avoid friction, inasmuch as in this position the tendency of the weight under the centrifugal force is to slide vertically along the stud with little or no side pressure thereon.

Instead of mounting the weight on the stud, which is the preferred construction, the weight might be pivotally mounted on the collar 4, as illustrated at 16 in Fig. 1.

While I have illustrated the governor weight as secured to a separate collar mounted on the driving shaft, it will be evident, of course, that the weight could be also secured to the hub of the fly-wheel should the general construction so warrant, or the weight could be secured to an extension hub or sleeve of any driving gear or pinion on the driving shaft. My construction, therefore, so far as this feature is concerned, readily adapts itself to the particular features of construction of the engine to which it is to be secured.

The engine valves are actuated in the usual way, and in the construction of engine to which my governor is applied, 17 is the exhaust lever for controlling the exhaust valve of the engine, pivoted at 18 on a suitable stud and actuated at properly timed intervals to open the exhaust by the cam 19 on the shaft 20, connected by gearing or otherwise (not shown) with the driving shaft. For the purpose of controlling this exhaust lever by the governor and holding open the exhaust at abnormal speeds, I provide a detent lever which comprises a long arm 21 and a short arm 22. The hub 23 of the long arm is pivotally mounted on the stud 24, projecting from the framework, and the hub 23 is provided with a sleeve 25 upon which is pivotally mounted the hub 26 of the short arm 22.

27 is an arm integral with or secured to the short arm 22, and this arm 27 has screw threaded engagement with the screw 28 which is secured to the arm 21 and is in screw threaded engagement therewith, and operated by a knurled head 29. 30 is a pin on this head of the adjusting screw, projecting inwardly toward the arm 21, so that the arm serves as a stop for the adjusting screw.

The outer end of the short arm 22 car-

ries a roller 31 arranged to come in contact with the segmental surface of the weight 7 at abnormal speeds, and the angularity of the detent lever is so adjusted that the segmental contact surface of the weight will just clear the roller 31 at all proper speeds. The outer end of the long arm 21 of the detent lever is provided with a tooth 32 to engage the notch 33 in the outer end of the exhaust lever 17. The play of the detent lever is confined within narrow limits by the pin 34 which is secured to and projects from the framework, and the outer end of which engages in the slot or enlarged opening 35 in the side of the detent lever. A torsional spring 36 is mounted on this pin 34, one end secured to the pin and the other end engaging the detent lever, so that normally the detent lever is held away from and out of engagement with the end of the exhaust lever.

While I have illustrated the detent lever as comprising a long and a short arm, of course it will be understood that the lengths of the arms both singly and with reference to each other is not of consequence. The important feature in this connection is that the detent lever shall be made of two portions which can be adjusted angularly with reference to each other, one end of the lever being engaged by the governor and the other arranged to engage the exhaust lever.

By reason of the mounting of the governor weight as heretofore described, there is very little friction in the centrifugal movement of the governor, and the movement of the weight responds very delicately to the rotation of the driving shaft. The center of the contacting surface of the governor weight is not concentric with the driving shaft, so that the weight in its rotation comes gradually in contact with the roller 31 on the detent lever.

The construction for adjusting the angularity of the detent lever also enables me to adjust the lever for contact with the governor weight at any desired speed, and this gives me complete control of the exhaust lever.

The surface of the knurled head of the adjusting screw 29 can be graduated, so that by turning this screw any desired speed of the engine may be easily maintained.

What I claim as new, and of my invention and desire to secure by Letters Patent, is:—

1. In a gas engine governor, the combination with the driving shaft, and the valve controlling lever, of a detent lever to hold said valve lever out of operation, a stud

mounted on the driving shaft tangentially of the surface thereof and extending in a direction opposite the direction of rotation, a weight to contact with said detent lever, said weight provided with a segmental contact surface eccentric of the driving shaft, and the weight being loosely mounted on said stud to shift centrifugally with the rotation of the driving shaft, whereby friction in the movement of the weight will be diminished upon acceleration of the movement of the driving shaft and at increasing speeds beyond the normal the weight shall come gradually into contact with said detent lever to lock the engine valve out of operation.

2. In a gas engine governor, the combination of the driving shaft, the valve controlling lever, and a detent lever to hold said valve lever out of operation, the said detent lever comprising a pair of arms with means for adjusting the angular relation of said arms, a weight with segmental contact surface mounted on the driving shaft to shift centrifugally with the rotation of said shaft, and to contact with said detent lever for its various abnormal adjustments.

3. In a gas engine governor, the combination of the driving shaft, the valve controlling lever, and a detent lever to hold said valve lever out of operation, the said detent lever comprising a pair of arms pivotally mounted, with one arm pivotally mounted on the other, an adjusting screw carried by one arm with engagement therefor with the other arm, for changing the angular relation of the detent lever arms, a weight with segmental contact surface mounted on the driving shaft to shift centrifugally with the rotation of said shaft and to contact with said detent lever at abnormal speeds.

4. In a gas engine governor, the combination of the driving shaft, the valve controlling lever, and a detent lever to hold the said valve lever out of operation, the said detent lever comprising a pair of arms, with means for adjusting the angular relation of said arms, a weight with a segmental contact surface, and a stud mounted tangentially on the driving shaft and upon which said the weight is loosely mounted with a spring to check the centrifugal movement of the weight, the segmental surface of the weight arranged to contact with the detent lever at abnormal speeds.

JOHN W. BENTLER.

Attest:

J. H. GRAVES,

W. H. BLANTON.