

G. O. TOBIAS.
GOVERNOR FOR INTERNAL COMBUSTION ENGINES.
APPLICATION FILED APR. 22, 1910.

1,044,105.

Patented Nov. 12, 1912.

3 SHEETS—SHEET 1.

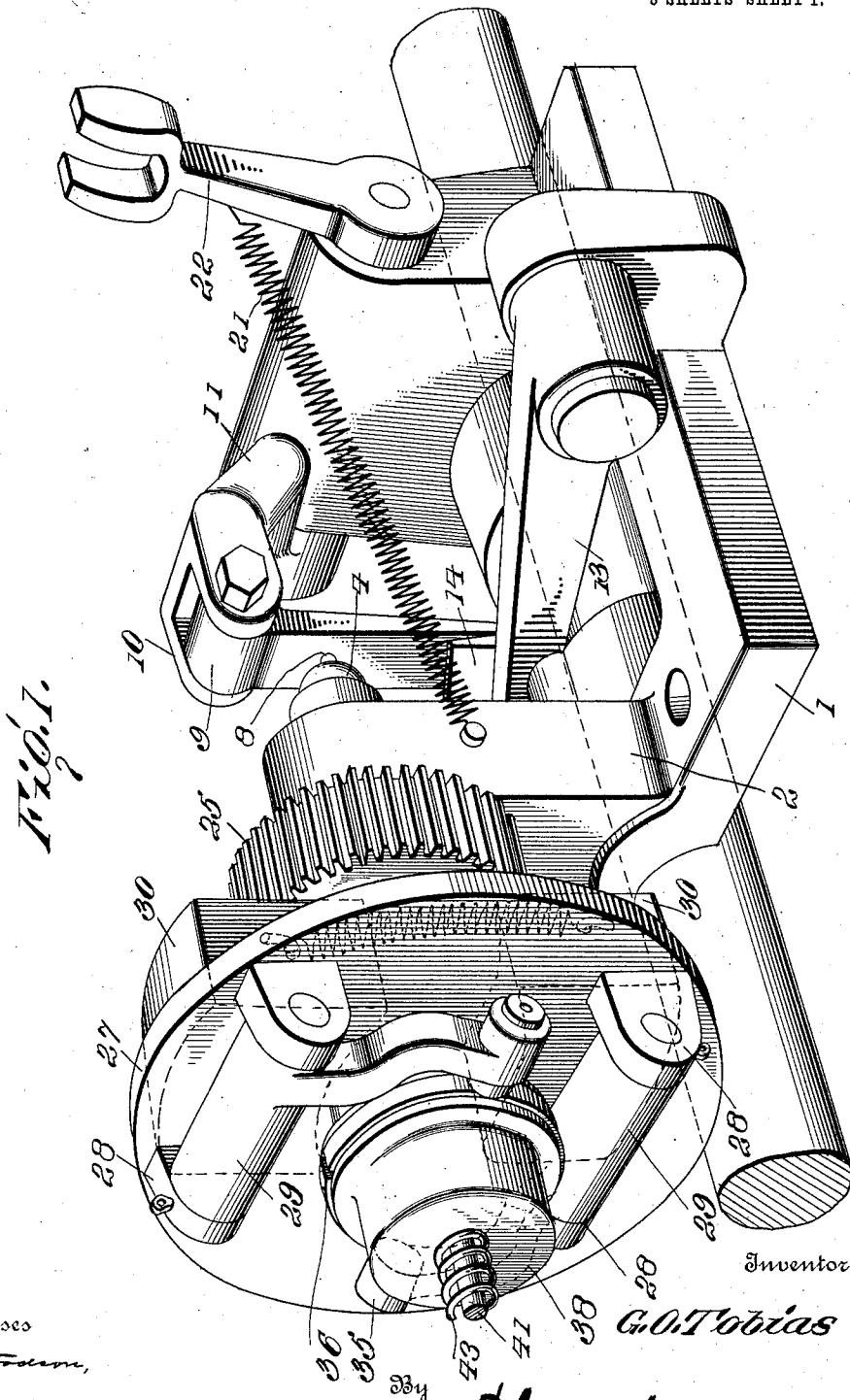


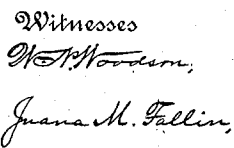
Fig. 1.

Witnesses
W. H. H. H. H.
J. H. H. H. H.

Inventor
G. O. Tobias
H. H. H. H. H., Attorneys.

1,044,105.

3 SHEETS—SHEET 2.



By

H. A. Kacey Attorneys.

UNITED STATES PATENT OFFICE.

GUY O. TOBIAS, OF CLINTON, MISSOURI.

GOVERNOR FOR INTERNAL-COMBUSTION ENGINES.

1,044,105.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed April 22, 1910. Serial No. 557,036.

To all whom it may concern:

Be it known that I, GUY O. TOBIAS, citizen of the United States, residing at Clinton, in the county of Henry and State of Missouri, have invented certain new and useful Improvements in Governors for Internal-Combustion Engines, of which the following is a specification.

This invention comprehends certain new and useful improvements in internal combustion engines, that are governed on the "hit or miss" principle, and relates particularly to an improved governor.

The invention has for its primary object, a simple, durable and efficient construction of governor of the centrifugal type designed to regulate the fuel supply by admitting only a sufficient number of charges necessary to maintain normal speed.

The invention also has for its object the provision of a governor, which possesses to a maximum degree the characteristics of sensitiveness and capability of close speed regulation, and the invention has for its further object to generally improve this class of devices and promote their commercial usefulness.

With these and other objects in view as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings in which:

Figure 1 is a rear perspective view of my improved governor; Fig. 2 is a longitudinal sectional view thereof with parts in side elevation; Fig. 3 is a face view of the device shown in operative relation to an engine cylinder; Fig. 4 is an end view; and, Fig. 5 is a perspective view of a portion of a lever hereinafter specifically referred to.

Corresponding and like parts are referred to in the following description and accompanying drawings by the same reference characters.

My improved governor mechanism embodies a bracket 1 which may be secured in any desired way to the casing of an internal combustion engine and which embodies a post or standard 2 formed with a bearing in which a relatively stationary shaft 3 is mounted. This shaft is tubular as shown,

and at its rear extremity is screw threaded for engagement with a nut 3^a.

The stem 4 is mounted for a longitudinal movement in the tubular shaft 3, and is preferably held against any rotary movement by means of a key 5 formed on the stem and working in a longitudinal slot 6 formed in the exteriorly threaded end 7 of the shaft 3. The stem 4 projects slightly from the shaft 3, as clearly illustrated in the drawing and is preferably provided at such protruding end with a centrally disposed nib or protuberance 8 designed to bear upon a blade 9 which is preferably of tool steel and which is pivotally suspended at one end, such end being mounted within the forked end 10 of the arm 11 of the fuel valve lever. In the normal relation of the parts, the lower edge of the blade 9 engages a shoulder 12 formed on a lever 13, said lever being also preferably formed with a lug 14 at one side of the shoulder, the lug being designed to guide the blade onto the shoulder and to limit the swinging movement of the blade in one direction. This lever 13 is fulcrumed at one end on a stud projecting from an apertured ear 15 formed on the bracket 1, and the opposite end of the lever carries a roller 16 designed for engagement by a cam 17 secured to or formed on the side rod 18 of the engine. A spring 19 tends to move the blade 9 toward the shoulder 12, the guide lug 14, and the protruding end of the stem 4, said spring in the present instance, being secured on a pin 20 formed on the arm 11 near the fork 10. 21 designates another spring, the last named spring being a contractile spring and secured at one end to a stud 23 on the other arm 22 of the fuel valve lever, while the opposite end of the spring 21 is connected to the post or standard 2.

The sleeve 24 is mounted for a revoluble movement on the shaft 3 and carries a spur pinion 25 which meshes with a gear wheel 26 secured on the side rod 18, the governor being thereby gear driven. The said sleeve 24 has formed on it or secured to it, intermediate of its ends a disk 27, the disk being formed on one face with oppositely disposed pairs of ears 28 between which the tubular bosses or hubs 29 of the governor weights 30 are pivotally mounted, the weights being connected to the hubs by relatively short shanks 31 which pass through slots formed in the disk 27. The sleeve 24 is so

proportioned that the pinion 25 is spaced from the adjacent face of the disk 27, the space thus formed accommodating the weights which are preferably formed with curved recesses in their opposing edges whereby to partially surround the sleeve. The weights are drawn together by means of contractile springs 33, the springs being secured to hooks 34 formed on the side edges of the weights.

Inwardly extending shipper levers 35 are formed on or secured to the respective hubs 29 of the weights, said levers extending parallel to the adjacent face of the disk 27, and each shipper lever carrying a substantially semicircular yoke 36. Each yoke is preferably provided with a stem 37 which is mounted for a slight turning movement in a bearing formed for it on the inner extremity of the lever 35 which carries it and the two yokes encircle the periphery of a cap 38, being received in a groove 39 formed therein.

The stem 4 is formed with an annular shoulder 40 which bears against the inner wall of the end of the cap 38 and with a reduced threaded end 41 which passes out through an opening formed in the end of a cap, a nut 44 screwing on this end of the stem beyond the end of the cap, as clearly illustrated in the drawings. Preferably a regulating spring 43 encircles the threaded end of the stem 4 and the adjusting nut 44 is secured to the extremity of the reduced end 41 and bears against the spring.

From the foregoing description in connection with the accompanying drawings, it will be understood that until the engine attains its normal speed, the blade 9 will be held in operative engagement with the lever 13 so as to intermittently and regularly actuate the fuel admission valve. When the normal speed has been attained, the centrifugal action of the weights 30 will tend to push the cap 38 inwardly on the end of the sleeve 24 upon which it is mounted and will consequently move the stem 4 against the blade 9, thereby resulting in pushing the blade away from the shoulder on the lever 13 and preventing the admission of more fuel until required by the reduction of the speed.

In the preferred construction of the parts a very slight movement of the stem 4, say

a movement of $\frac{1}{32}$ of an inch, is sufficient to cut out or admit fuel, and this, particularly in connection with the simplicity, durability and efficiency of the construction of the parts produces a very sensitive and durable governor.

Having thus described the invention, what is claimed as new is:

1. In an engine, the combination with a fuel valve lever and an actuating lever therefor, of means for operatively connecting said levers together, said means being detachable from one of the levers, a tubular shaft, a stem longitudinally movable in said shaft and adapted to move the lever connecting means to an inoperative position, a sleeve mounted to rotate on said shaft, means for turning the sleeve, a disk carried by the sleeve, centrifugally acting weights connected to the disk, a cap movable on the sleeve and adapted to engage the stem and move the same in one direction, and shipper levers operatively connecting said cap to the weights.

2. In an engine, the combination with a fuel valve lever and an actuating lever therefor, of means for operatively connecting said levers together, said means being disengageable from one of said levers, a tubular shaft, a stem mounted for a longitudinal movement in said shaft and adapted to move the lever connecting means to an inoperative position, a sleeve mounted to rotate on the shaft, a cap fitting over one end of the sleeve and movable longitudinally thereon and adapted to engage the stem and move it in one direction, a disk secured to the sleeve intermediate the ends thereof, weights disposed on one side of said disk, shanks connected to the weights and passing through the disk to the opposite side thereof, the shanks being provided with hubs pivotally connected to the disk at the last named side of the latter, shipper levers connected to the respective hubs and extending inwardly toward each other in planes parallel to the adjacent side of the disk, and yokes carried by said shipper levers and operatively connected to said cap.

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

GUY O. TOBIAS. [L. S.]

Witnesses:

FRANK M. HART,
WILLIAM KIMBALL.