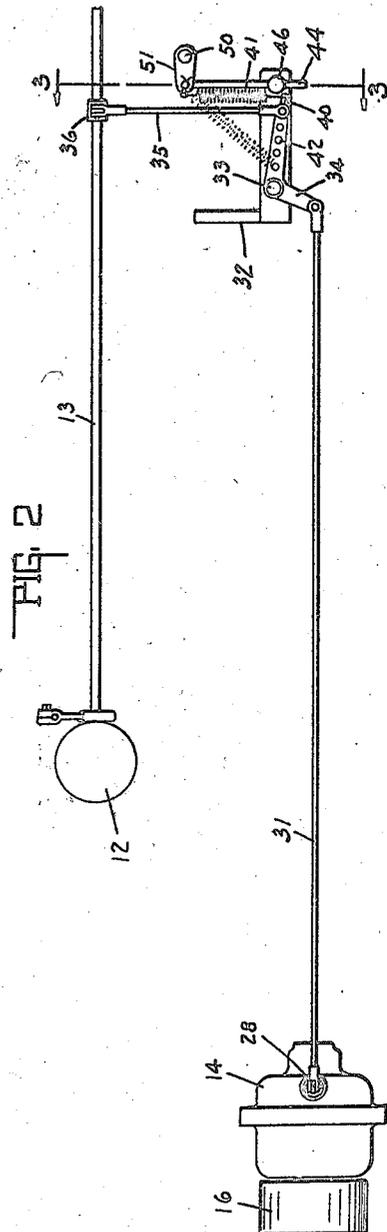
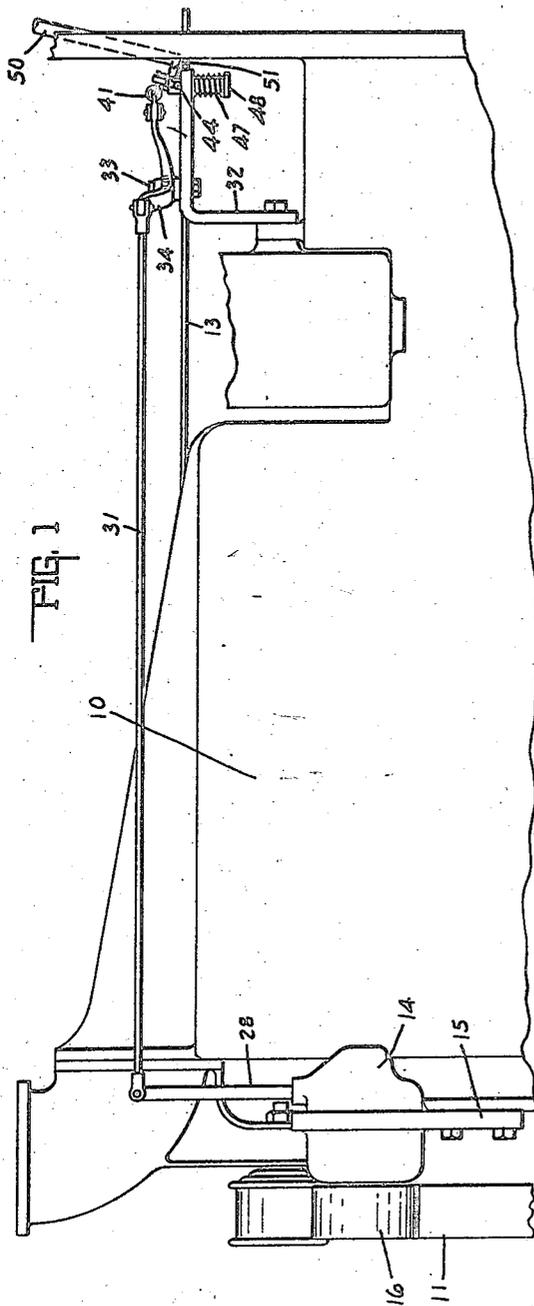


Jan. 2, 1923.

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G. W. PIERCE.  
GOVERNOR FOR INTERNAL COMBUSTION ENGINES.  
FILED NOV. 1, 1920.

2 SHEETS—SHEET 1.



INVENTOR.  
GEORGE W. PIERCE.

BY

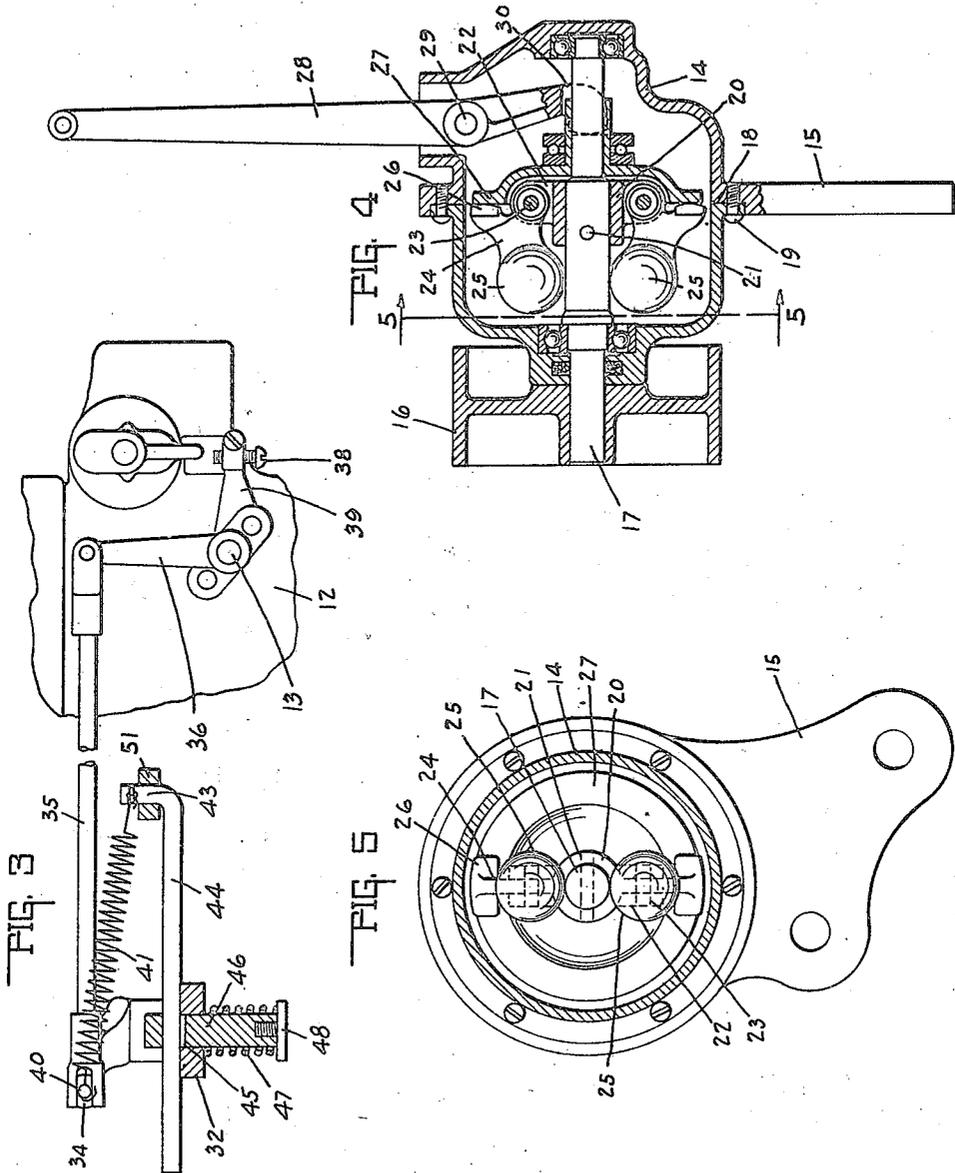
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## UNITED STATES PATENT OFFICE.

GEORGE W. PIERCE, OF ANDERSON, INDIANA, ASSIGNOR TO PIERCE GOVERNOR CO.,  
OF ANDERSON, INDIANA, A CORPORATION.

## GOVERNOR FOR INTERNAL-COMBUSTION ENGINES.

Application filed November 1, 1920. Serial No. 420,907.

*To all whom it may concern:*

Be it known that I, GEORGE W. PIERCE, a citizen of the United States, and a resident of Anderson, county of Madison, and State of Indiana, have invented a certain new and useful Governor for Internal-Combustion Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

This invention relates to governing means for self propelled internal combustion engines. The chief object of the invention is to provide governing means which will automatically regulate the power generated by the internal combustion engines with which the same is associated, and when said engine is associated with a self propelled vehicle said governing means is adapted to control the speed thereof as well.

The chief feature of the invention consists in the manner of operating and controlling the governor and in installing and operating the controlling mechanism and governor on the motor vehicle whereby the supply of gas or fuel to the motor will be controlled by the speed of the motor or vehicle so as to maintain the speed constant as predetermined and set by the operator. In other words if it is desired that the vehicle travel at a speed of fifteen miles an hour it will be started and automatically attain that speed with the throttle set accordingly. Upon a change in load or traction surface, the governor will automatically operate the throttle by the variation of the engine speed whereby said speed will tend to be kept constant.

Another feature of the invention consists in associating the means for adjusting the limit at which the governing means becomes effective with other means for varying said limit.

Another feature of the invention consists in the construction of the adjusting and operating means and the method and manner of operating the same on the motor whereby the adjustment and control will be effective without any material changes being made in the original arrangement of parts in the motor.

The full nature of this invention will be understood from the accompanying drawings and the following description and claims.

In the drawings Fig. 1 is a side elevational view of an internal combustion engine to which the invention has been applied. Fig. 2 is a semi-diagrammatic plan view of the invention and the parts associated therewith. Fig. 3 is an enlarged sectional view of the invention taken on the line 3-3 of Fig. 2 and in the direction of the arrows. Fig. 4 is an enlarged central sectional view of the governing device. Fig. 5 is a cross sectional view of the governing device taken on the line 5-5 of Fig. 4 and in the direction of the arrows.

In the drawings 10 indicates an internal combustion engine provided with a fan belt 11, a throttle valve construction 12 controlled by the throttle rod 13. The governing device herein illustrated is of the fly ball type, and said governing device is indicated at 14 and is suitably supported upon the engine by the bracket member 15. The pulley wheel 16, in the present instance, is adapted to be associated with the fan belt 11 of the internal combustion engine and be driven thereby. Thus the speed of the governor will be directly proportional to the speed of the internal combustion engine. The governor, in the present instance, (see Figs. 4 and 5) comprises a shaft 17 rotatably supported within the housing portion 14 of the governor, said shaft being provided with suitable bearings within said housing and having one end thereof extending outwardly from the same to support the pulley 16 so as to be rotated thereby. Within the housing member 14, which in the present instance is shown divided at 18 and said sections secured together by suitable bolt or rivet means 19, is a collar portion 20 suitably secured to the shaft 17 as by means of the pin 21. The collar portion 20 is provided with a plurality of ears 22 and between each pair of ears is pivotally supported at 23 a weighted lever 24, one end of which is provided with a ball weight 25 and the other end of which is provided with the bumper 26. Slidably supported upon the shaft 17 is a bearing ring 27, which bearing ring is adapted to engage and bear against one end of the lever 28 pivotally supported at 29 in the housing member 14, said engaging end of the lever being indicated by the dotted lines and the numeral 30 in Fig. 4.

From the foregoing it will be understood that rotation of the shaft 17 through the

belt pulley 11 and the pulley wheel 16, causes the weighted balls 25 to move outwardly from the shaft 17 due to the centrifugal force acting thereon. The bumper 26, therefore, engage the bearing ring 27 to tilt the lever 28 upon its pivot 29, and this tilting movement of the lever is transmitted to the rod 13, shown in Fig. 2, through the means illustrated in Figs. 1, 2 and 3.

The means for transmitting the tilting movement of the lever 28 comprises a rod member 31 secured at one end to the other end of the lever 28. A suitable bracket 32, see Figs. 1, 2 and 3 pivotally supports at 33 a bell crank lever 34, one end of which is secured to the other end of the rod member 31. Thus, the tilting movement of the lever 28 is transmitted to and through the lever 34. The other end of the lever 34 is suitably connected to one end of the link or rod member 35, the other end of which, see Fig. 3, is connected to a lever 36 secured to the shaft 13, which shaft carries the throttle valve of the internal combustion engine. The throttle valve is not shown in the drawings other than being indicated by the numeral 12 in Fig. 2. In the internal combustion engine with which this invention is associated there is provided an adjusting screw 38 associated with the lever 39 for adjusting the initial position of the throttle valve controlling shaft 13 and, therefore, the throttle valve. This feature, however, is not claimed in the present invention. This movement of the lever 28, which has heretofore been described, is transmitted to the rod 31, bell crank lever 34, link rod 35, lever 36 and shaft 13.

Reference will now be had to Figs. 1, 2 and 3 wherein the yielding or frictional maintaining means and the adjustment thereof and the manual operation thereof will now be described. The lever 34 is provided with an extension 40 adjacent its connection with the link rod 35. A coil spring 41 is secured to the extension 40 of the lever 34, or adjusted by securing it in the intermediate holes 42 of the lever 34. The other end of the coil spring 41 is secured to an angularly extending end 43 of a friction rod 44. The friction rod 44 is frictionally supported by the bracket 32, see Fig. 3. Said bracket is suitably slotted at 45 to receive a rod engaging yoke member 46, which yoke member extends through said opening or slot 45 in the bracket 32 and is adapted to clamp the friction rod 44 to said bracket and frictionally maintain the same in position thereon. The means for frictionally clamping said bracket 32 and the yoke member 46 comprises a coil spring 47 co-axial with the depending portion of said yoke member and a spring retaining cap member 48. Other friction means, if desired, may be substituted for the frictional clamping construction shown. The foregoing is the preferred

construction. Thus, the tension of the spring 41 regulates the initial position of the lever 28 and consequently the initial position of the bearing ring 27 of the governing device. Increasing the tension of the spring 41 tilts the lever 28 upon the pivot 29 and forces the bearing ring 27 into a position such that the fly ball actuated bumpers 26 will engage said ring sooner than otherwise would be the case if the tension of the spring 41 were reduced. Thus, by means of the links 42 the initial tension of the spring 41 may be adjusted to the entire combination of rods, levers and governing device.

The means for varying the tension of the spring 41 during the operation of the internal combustion engine comprises the manually operated rod member 50, see Figs. 1 and 2, which rod member comprises a rock shaft upon which is secured a lever 51, which lever at its other end is associated, as shown in Fig. 3, with the angularly extending end of the friction rod 44 so that said rod may be manually moved when desired by means of the rod 50 in opposition to the frictional clamping engagement of the means hereinbefore described. Thus clockwise rotation of the shaft or rod 50 will increase the tension of the spring member 41 and counterclockwise rotation of the shaft 50 will reduce the tension thereof.

From the foregoing it will be noted that the invention includes two features, one, the driving of the governor by the fan belt of the engine so that the governor pulley wheel acts as a belt tightener, as well as the governor speed being proportional to the engine speed, and second, the connection between the usual manually operable fuel controlling means and the governor, whereby manual control as well as mechanical control is possible as desired.

While the invention has been described in considerable detail, many modifications thereof will readily suggest themselves to those skilled in the art to which the invention applies, and these modifications are all considered to be within the broad purview of this invention, reference being had to the appended claims.

The invention claimed is:

1. A controlling device including a controlled member, a pair of controlling members, a connection between one of said controlling members and said controlled member, and yielding means frictionally retaining said last mentioned controlling member in position but permitting forcible movement thereof.

2. A controlling device including a controlled member, a controlling member, a bell crank connected at one end to said controlling members and its other end being associated with the controlled member, means connecting said association and the other

controlling member, and means frictionally retaining said last mentioned controlling member in position but permitting forcible movement thereof.

5 3. A controlling device including a controlled member, a pair of controlling members, a connection between one of said controlling members and said controlled member, a second connection between the other  
10 controlling member and said first mentioned connection, frictional means for retaining

said last mentioned controlling member in position, but permitting forcible movement thereof comprising a pair of oppositely acting gripping members, frictional means for associating said gripping members together, and a member associated with said gripping members and said second mentioned connection for controlling the position of the latter.

In witness whereof, I have hereunto affixed my signature.

GEORGE W. PIERCE.