Dec. 27, 1927. 1,653,687

A. E. WILSHUSEN

AUTOMOBILE SPEED CONTROL

Filed Jan. 28, 1924 3 Sheets-Sheet 1

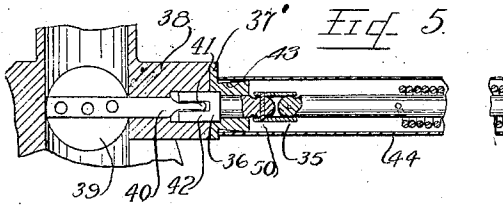
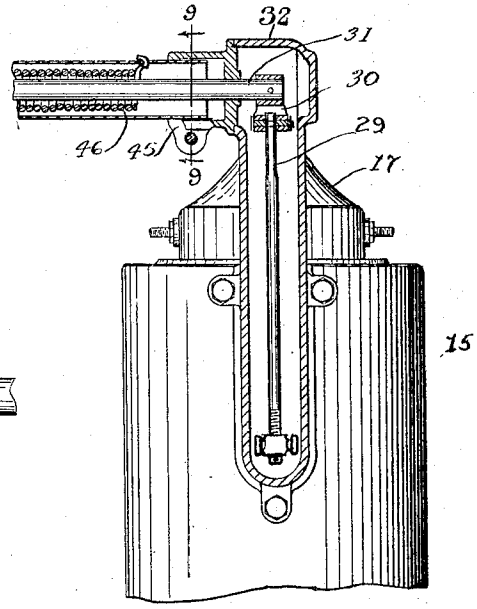


Fig. 5.



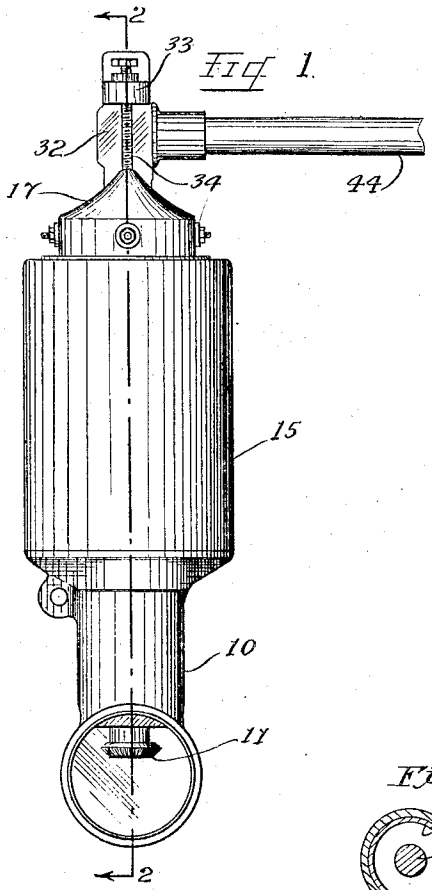


Fig. 1.

Fig. 4.

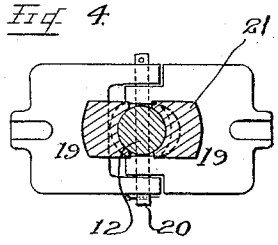
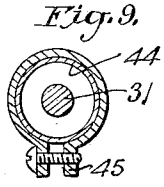


Fig. 9.



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AUTOMOBILE SPEED CONTROL

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Fig. 2

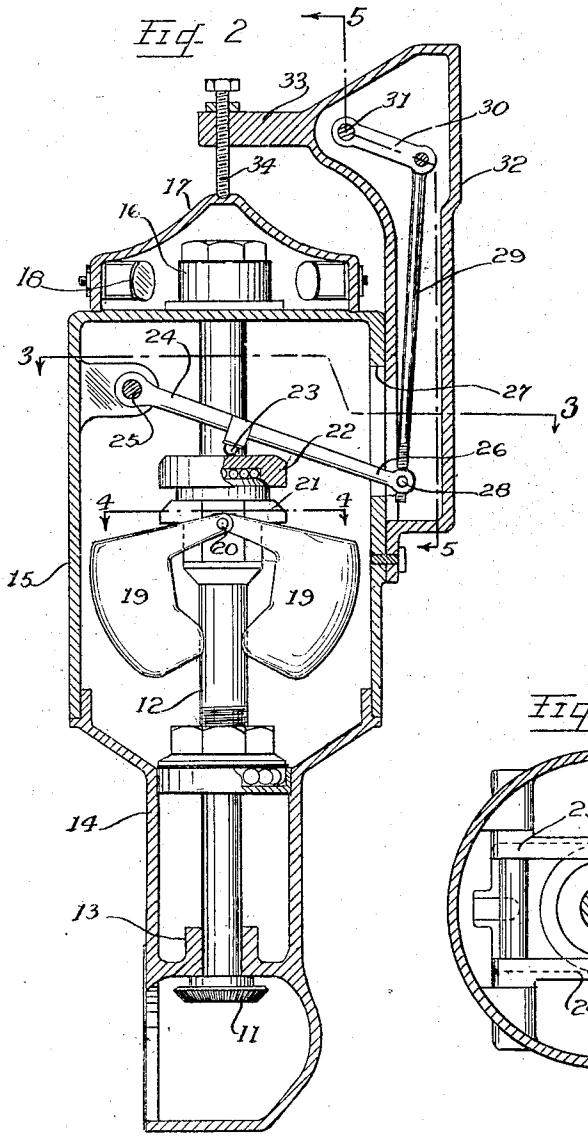
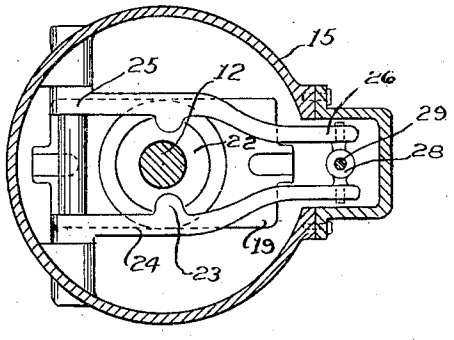


Fig. 3



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AUTOMOBILE SPEED CONTROL

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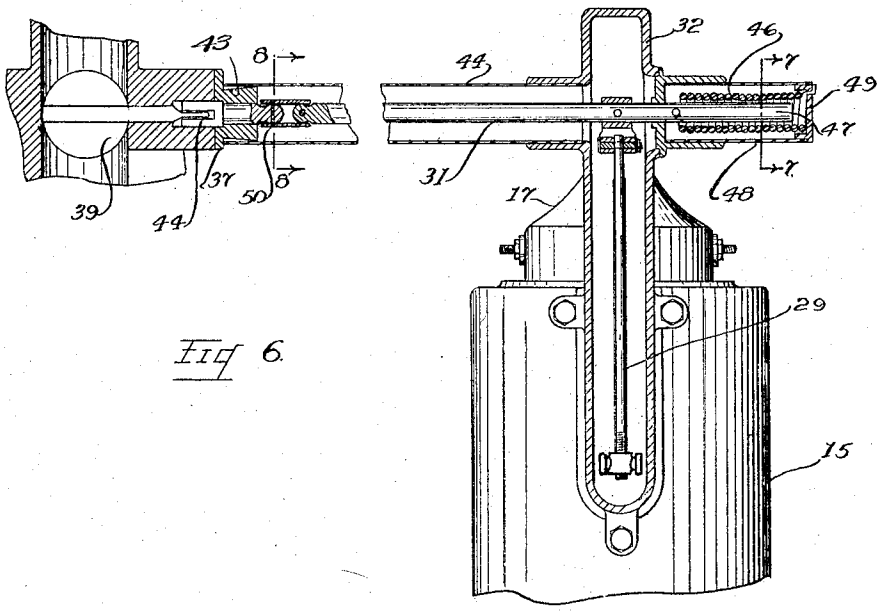


Fig 6.

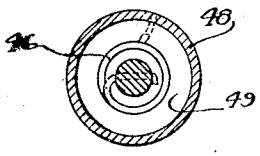


Fig 7.

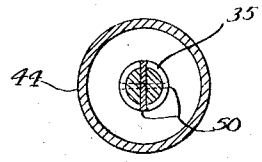


Fig 8.

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Patented Dec. 27, 1927. 1,653,687

UNITED STATES PATENT OFFICE.

AUGUST E. WILSHUSEN, OF KOKOMO, INDIANA.

AUTOMOBILE SPEED CONTROL.

Application filed January 28, 1924. Serial No. 689,190.

This invention relates to throttling speed governors for attachment to internal combustion engines and more particularly to an improved form of operating linkage between centrifugal governor weights and a throttle valve in the intake manifold of the engine.

It is an object of this invention to provide an improved governor of the class described which will be adapted to be attached to existing engines in place of the usual ignition distributor, which distributor is relocated as a part of the governor assembly. I have previously disclosed such a governor in my application filed April 8th, 1921, Serial No. 459,782. The present invention relates to simplified and improved throttle control linkage operated by the governor mechanism.

It is an object of this invention to provide an operating linkage for the purpose mentioned that will permit a small amount of angular displacement or misalignment between the throttle and the governor while maintaining a direct and unalterable relationship between the governor and the throttle.

It is a further object of the invention to provide an entirely enclosed operating mechanism whereby the governor cannot easily be disconnected from the throttle by an operator afflicted with speed mania. It has frequently happened that with exposed operating connections the operator has disconnected some link after leaving the owners place of business and left the governor disconnected until just before his return, thus rendering the vehicle and its load liable to injury due to the increased shocks resulting from over-speeding.

It is also an object of this invention to provide such a form of linkage wherein the limiting speed at which the governor closes the throttle valve may be adjusted within a given speed range.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in the preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is an elevation of a governor embodying features of this invention with some parts fragmentarily shown.

Figure 2 is an enlarged section on the line 2—2 of Figure 1 with parts in elevation.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a section on the line 4—4 of Figure 2, with parts omitted.

Figure 5 is a sectional view of a preferred form of the throttle operating linkage taken on the line 5—5 of Fig. 2.

Figure 6 is a sectional view of a slightly modified form of linkage.

Figure 7 is a section on the line 7—7 of Figure 6.

Figure 8 is a section on the line 8—8 of Figure 6.

Figure 9 is a section on line 9—9 of Figure 5.

As shown on the drawings:

A two part governor casing is shown in the figures, the lower part 10 serving to replace the common commutator mounted adjacent the end of the engine camshaft. The commutator segment is removed from the camshaft and a bevel gear substituted therefor which drives a bevel gear 11 on the lower end of a governor drive shaft 12 journalled in the casing at 13. A thrust bearing 14 is provided to take the downward thrust of the governor mechanism. The upper half 15 of the casing supports the upper end of the shaft 12 which projects therethrough to receive a commutator rotor or segment 16, the top of the casing being formed to receive a commutator shell 17 containing contacts 18.

The governor mechanism proper comprises a pair of lobed centrifugal weights 19 pivoted to the shaft 12 at 20 and serving to lift a collar 21 on the shaft. The collar is provided with a ball thrust bearing 22 the top of which is intended to be stationary when in engagement with the lugs 23 of a bifurcated lever 24 pivoted at one end 25 to the casing. The other end 26 of this lever projects through an aperture 27 in the wall of the governor casing and is provided with a threaded wrist pin 28 in which is threaded a link 29 which operates a crank 30 on a horizontal throttle operating shaft 31. The link 29 and crank 30 operate within a housing 32 bolted to the side of the governor casing and serving as a support for one end of the operating shaft 31. This housing 32 is provided with an arm 33 carrying a screw 34 which serves to hold the commutator shell 17 in place.

The shaft 31 terminates in a coupling 35 which is fastened to a stub shaft 36 having a bearing in a flanged member 37 which is

intended to be bolted to a section of an intake manifold 38 carrying a throttle valve 39 and shaft 40. The throttle shaft 40 ends in a tongue having an enlarged or bulb tip 41 which engages in a slot 42 in the end of the stub shaft 36. The purpose of the enlarged tip 41 is to allow for possible small errors of alignment between the throttle shaft and the stub shaft. The flanged member 37 is provided with a tapered shoulder 43 to receive a tube 44 encasing the operating shaft 31.

Up to this point the two forms of Figures 5 and 6 are practically identical. In Figure 5 the other end of the tube 44 is secured in a split clamp 45 formed as a part of the housing 32. Incorporated with the clamp is a bearing or support for the operating shaft 31. A torsional spring 46 within the tube 44 has one end attached to the operating shaft 31 and the other end is passed through an aperture in the tube. The spring is so wound as to normally hold the throttle open, i. e. to oppose the governor action, and the tension of the spring may be adjusted by loosening the clamp 45 and rotating the tube 44 in its supports and re-clamping at the desired spring tension.

The modification of Figure 6 differs from the foregoing in that the spring 46 is mounted on an extension 47 of the shaft 31 together with a supplemental tube 48 with an end cap 49 is mounted on the side of the housing opposite the tube 44 which in this case does not have to be rotated as the supplemental tube 48 and cap 49 care for the adjustment of the spring tension.

The coupling 35 is secured to the operating shaft 31 and stub shaft 36 by pins 50 at right angles to each other so that the coupling serves as a universal joint for small angles. Further the tapered shoulder provided on the member 37 allows the tube 44 to seat thereon at a small angle so that the operating shaft and tube may be assembled at a small angle to the throttle shaft to allow for variation in the level of the governor as a whole relative to the intake manifold.

The operation of this device will be clear from the foregoing with the possible exception of the following points. The torsion spring 46 serves to restrain the operation of the governor below the speed corresponding to a balance between the centrifugal forces created by the governor weights and the initial spring tension. When the governor forces increase above this point the governor controls the throttle, below the point the engine speed is ungoverned and would be controlled in practice by a hand throttle or foot accelerator of well known type. Inasmuch as the spring tension is adjustable the governed speed of the engine is adjustable. A peculiarity of this construction is that the governor does not come into action until the critical speed range is reached so that the full power of the engine may be used at any point in the speed range below the desired maximum.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim as my invention:

1. A throttle valve control for internal combustion engines including the combination with a governor driven by the engine, of a lever receiving the governor motion, an adjustable link leading therefrom, an operating shaft having a crank connected to said link, a housing for said crank and link, a connection between said operating shaft and said throttle valve, a rotatable enclosure for said operating shaft, a torsional spring wound around said shaft and connected to the enclosure and the shaft whereby the tension on the spring may be varied by rotating the enclosure, and means adapted to permit rotation of said enclosure to vary the tension of said spring.

2. A governor operated throttle valve comprising a governor, an operating shaft connected between said governor and said throttle valve, a rotatable tube enclosing said operating shaft, a torsion spring wound upon said shaft and connected to said shaft and tube whereby the tension on the spring may be varied by rotating the tube, and means adapted to permit rotation of said enclosing tube to adjust the tension of said spring.

3. A governor operated throttle valve comprising a governor, an operating shaft connected between said governor and the throttle valve, a rotatable tube enclosing said operating shaft, a coiled spring disposed around said shaft and connected to the shaft and enclosing tube, whereby the tension on the spring may be varied by rotating the tube.

In testimony whereof I have hereunto subscribed my name.

AUGUST E. WILSHUSEN.