July 2, 1929. C. F. FREAY 1,719,263

THROTTLE GOVERNOR

Filed April 24, 1928

Fig. 1.

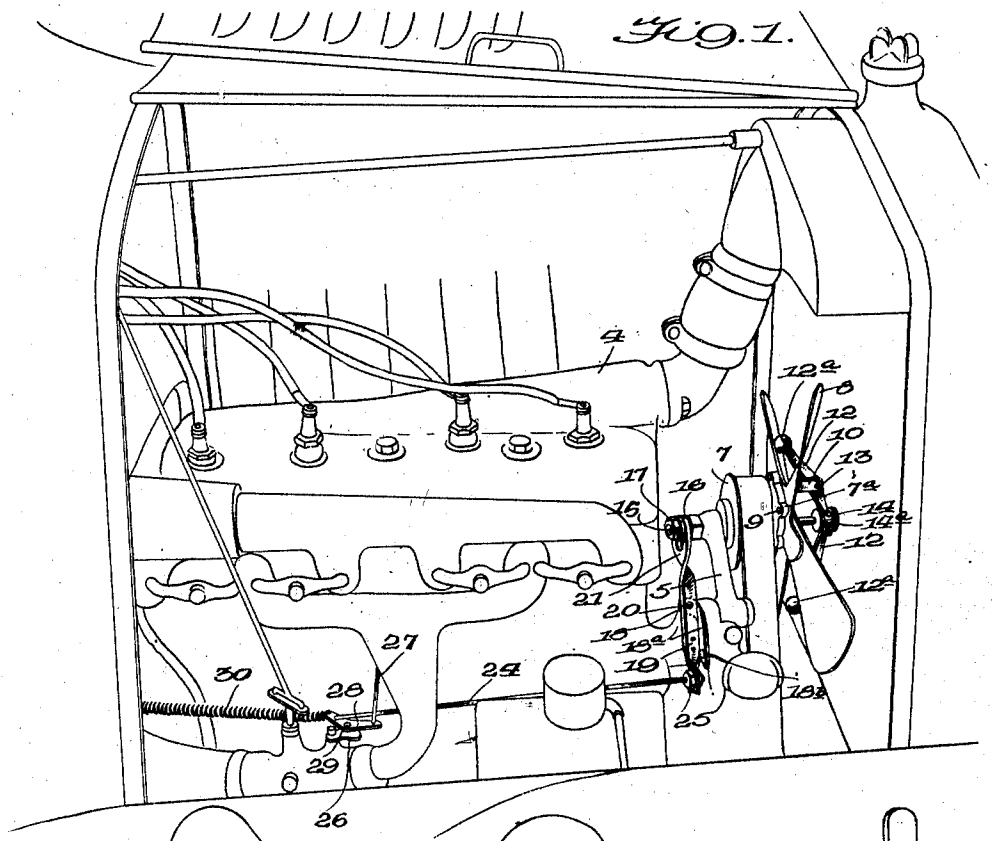


Fig. 4.

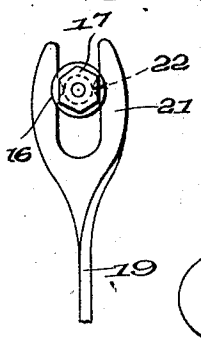
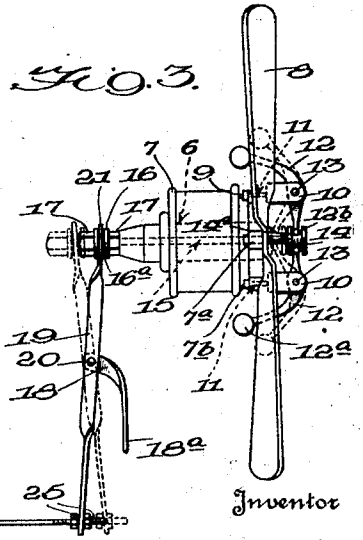


Fig. 2

Fig. 3.



Inventor

Charles F. Freay

By Miles B. Stevens & Co.

Attorneys

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UNITED STATES PATENT OFFICE.

CHARLES F. FREAY, OF KENNEDY, NEW YORK.

THROTTLE GOVERNOR.

Application filed April 24, 1928. Serial No. 272,555.

My present invention relates to governors for internal combustion engines, and particularly to such as are associated with the cooling fan.

Primarily, the invention contemplates a governor of this kind which is of inexpensive, highly simplified, and durable construction; light in weight; readily applicable to the engine without alteration of its structural arrangement and requires a minimum of working space; capable of being disconnected while motor is running; and which can be applied to vertical and horizontal engines of automobiles or tractors with equal facility.

The foregoing and other objects of the invention are attained by means of a novel combination and arrangement of parts to be hereinafter described and claimed, and in order that the same may be better understood reference should be had to the accompanying drawings forming a part of this specification. The drawings illustrate the now preferred embodiment of the invention but it is to be understood that the structure shown and described may be considerably changed and modified without departing from the spirit and scope of the invention as claimed.

In the drawings,

Figure 1 is a perspective view showing the invention applied to an internal combustion engine of popular make;

Figure 2 is a front elevation of the device;

Figure 3 is a side elevation, and,

Figure 4 is a detail view of a lever and governor rod connection.

Referring specifically to the drawings, wherein identical parts are designated by the same reference characters throughout the several views, numeral 4 indicates generally an internal combustion engine, and 5 the conventional supporting bracket of the stub shaft 6 upon which the fan pulley 7 is journalled and secured as usual. The fan 8 is fastened in standard fashion to the apertured ears 7^a of the forward pulley extension by means of bolts 9.

The front face of the hub portion of the fan 8 is provided with diametrically opposite U-shaped bearings 10 having securing bolts 11 extending through the fan hub and certain of the apertured ears 7^a of the fan pulley 7. Nuts 7^b threaded on the inner ends of bolts 11 serve, not only to hold the U-shaped bearings 10 in place but also cooperate with the bolts 9 to secure the fan to the pulley.

Each of the bearings 10 carries a governor arm 12 in the form of a bell-crank and weighed at its outer end as denoted at 12^a. The governor arms are pivoted in the bearings 10 by means of pins 13 as shown, and the inner ends of the arms terminate in short cross pieces 12^b which are received in opposite edge recesses 14^a of a block 14.

A rod 15 is rigidly fastened to the block 14 in any preferred manner and extends rearwardly through a longitudinal bore of the stub shaft 6. The rear end of the rod 15 which projects beyond the end of the shaft 6 carries an adjustable disk-like block 16,—circumferentially grooved as at 16^a,—and which is interposed between two adjusting nuts 17 threaded upon rod 15.

A metal bracket 18 has its offset end 18^a bolted to the motor as at 18^b, the major portion of the bracket paralleling the fan bracket 5. A strap metal lever 19 right-angularly twisted at each end, is pivoted to the bracket 18 as at 20. The upper end of lever 19 is U-shaped as denoted at 21 and each arm of the U has an inward projection 22 engaging in the circumferential recess of the disk block 16. Thus lever 19 will be swung as rod 15 moves under the influence of governor arms 12.

The lower right-angularly twisted end of lever 19 is provided with a series of holes 23 for selective reception of the end of an auxiliary throttle control rod 24. The holes 23 loosely receive the end of the rod 24, the lever 19 being interposed between two adjusting nuts 25 threaded on the rod which form a convenient means for relatively adjusting the rod and lever as occasion may require.

The throttle valve lever 26 of the carbureter which is provided with the usual controlling connection 27 has secured to its top face an angularly disposed auxiliary lever 28. Small machine screws 29 are em-

ployed for attaching auxiliary lever 28 to lever 26. Lever 28 is provided with two holes,—one for a spring 30 secured to the dash or other convenient part and the other hole receiving the hooked end of rod 24.

From the structure described it will be clear that when the motor and fan are driven at a predetermined speed the governor arms 12 responding to the centrifugal force set up will swing outwardly. The engagement of the ends 12^b of the arms with block 14 moves same with rod 15 inwardly whereby the lever 19 will be moved in a counter clockwise direction to press throttle lever 26 in a direction to cut down the supply of fuel. The purpose of spring 30 is to resist to a certain extent the centrifugal action of the governor arms 12. However its strength is not sufficient to interfere with the ordinary throttle control by the driver through the usual throttle connection 27.

It is pointed out that by reversing the governor arms 12 the device is capable of application to a carbureter, the control lever of which extends in a direction opposite to the direction of lever 26,—or wherein the throttle is closed by a clockwise movement of its valve lever instead of the counter clockwise movement as shown.

Inward movement of the rod 15 is limited by the engagement of block 14 with the hub part of fan 8, and outward movement is limited by engagement of the inner adjusting nut 17 with the end of stub shaft 6. Obviously, by adjusting the inner nut 17 of rod 15 the movement of rod 15 can be so limited as to avoid danger of the block 14 or arms 12 contacting with the radiator of the car. Also, the two nuts 17 can be spaced to allow the disk block 16 a certain amount of play on rod 15 so that lever 19 will not be actuated until the governor arms 12 have moved a predetermined distance. The same result can be obtained by spacing the nuts 25 of auxiliary throttle rod 24 to allow a play space for the lower end of lever 19.

The device can be disconnected while the motor is still running by simply unscrewing the outer of nuts 25 so rod 24 can be disengaged from rod 19 and the hooked end thereof slipped out of its hole in the auxiliary throttle lever 28. However, it is not really necessary to disconnect rod 24 to render the governor device inoperative, as this can be accomplished by materially separating each pair of nuts 17, 25.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a fan and governor assembly for internal combustion engines, a fan, a driven pulley to which the fan is secured; a shaft upon which said pulley is journalled and having a longitudinal bore extending therethrough; U-shaped bearings having their ends flatly engaging the outer face of the hub of said fan; fastening elements extending through the ends of said U-shaped bearings and secured to the pulley for holding the bearings, fan and pulley in rigid assembled relationship; centrifugally acting governor arms journalled in said bearings; an axially slidable rod extending through and projecting from both ends of the bore of said pulley shaft; a block fixedly mounted on the end of said rod adjacent said fan and having recesses receiving and operatively connecting the inner ends of said governor arms with the block whereby said shaft will be moved longitudinally through the influence of said arms; a disk like block loosely mounted on the other end of said rod and having a circumferential peripheral groove; stop nuts threaded on said rod on opposite sides of said disk block whereby the latter may be relatively adjusted, the inner of said stop nuts engaging the adjacent end of the pulley shaft to thereby limit the outward movement of said rod and the governor arms; a swingingly mounted lever having a U-shaped end engaging in the circumferential groove of said disk block whereby to operatively connect the lever with said rod; and an auxiliary throttle-controlling element connected to the other end of said lever.

2. In a fan and governor assembly for internal combustion engines, a fan, a driven pulley to which the fan is secured; a shaft upon which said pulley is journalled and having a longitudinal bore extending therethrough; bearings disposed upon the outer face of the hub portion of the fan; securing means associated with said bearings for holding said bearings, fan and pulley assembled; centrifugally acting governor arms journalled in said bearings; an axially slidable rod extending through and projecting from both ends of the bore of said pulley shaft; means for operatively connecting the said governor arms with said rod adjacent one end thereof; adjustable means associated with the other end of said rod for limiting the sliding movement thereof in the direction of said fan; and a throttle controlling means associated with said rod.

3. In a fan and governor assembly, a rotatable fan, a shaft on which said fan is journalled, said shaft having a longitudinal bore extending therethrough, centrifugally acting governor arms transversely journalled upon said fan and exteriorly thereof, a throttle controlling element extending through said bore and operatively connected with said governor arms, and stops carried by said throttle controlling element at each end, one of the stops being engageable with the outer face of the fan and the other with the inner end of said shaft for limiting the movement thereof and the movement of said governor arms whereby to prevent said gov-

ernor arms from contacting with elements that may be associated with said fan.

4. In a fan and governor assembly for internal combustion engines, the combination with the fan, its driven pulley and the securing elements which secure the fan to the pulley, of bearings secured against the outer face of the fan hub by said elements, swingable governor arms journalled in said bearings, and a control element operatively engaged by said governor arms.

In testimony whereof I affix my signature.

CHARLES F. FREAY.