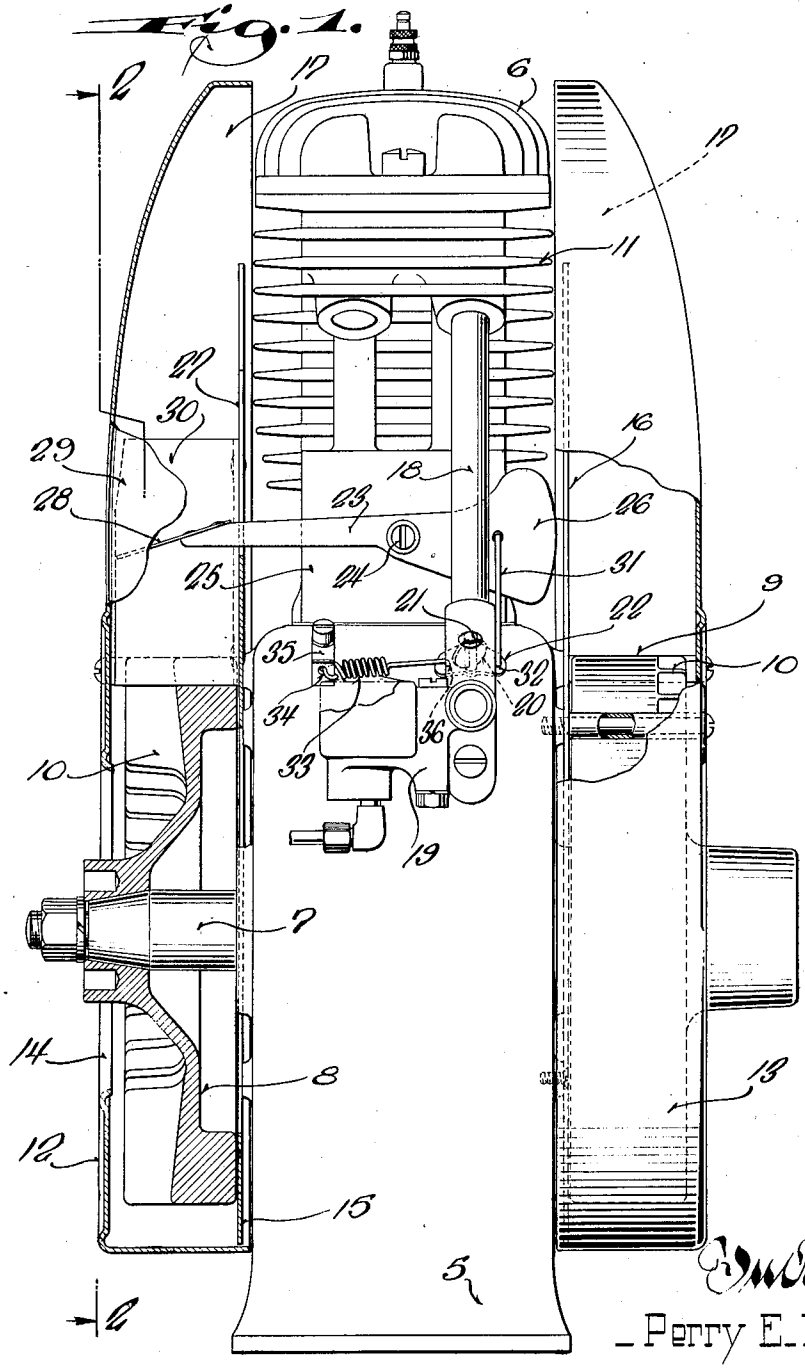
Feb. 21, 1928. 1,660,079

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GOVERNOR FOR MOTORS

Filed May 13, 1925 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

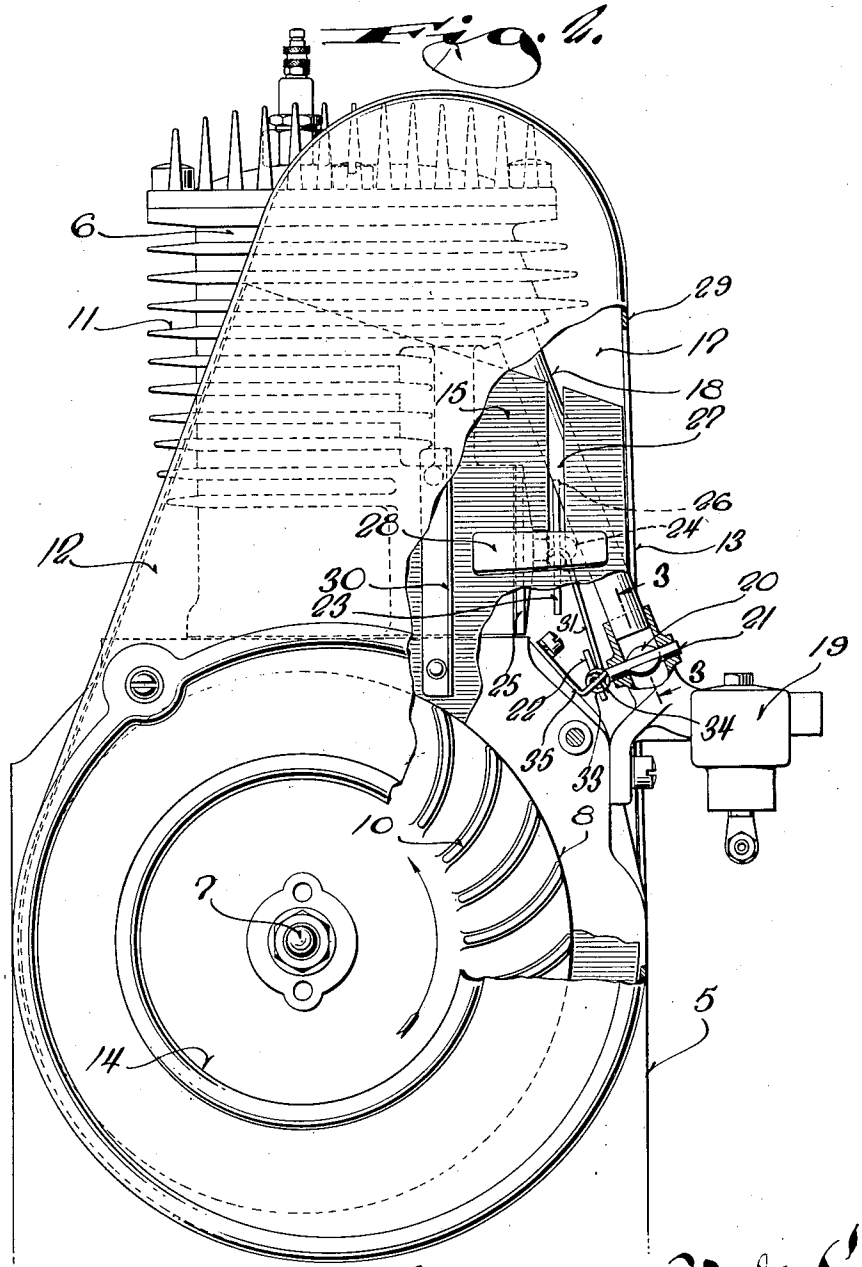
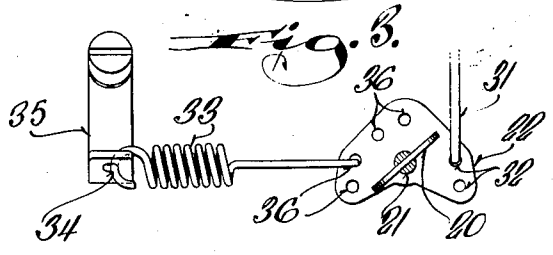


Fig. 3.



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Patented Feb. 21, 1928. 1,660,079

UNITED STATES PATENT OFFICE.

PERRY E. MACK, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO BRIGGS & STRATTON CORPORATION, OF MILWAUKEE, WISCONSIN, A CORPORATION OF DELAWARE.

GOVERNOR FOR MOTORS.

Application filed May 18, 1925. Serial No. 31,102.

This invention relates to certain new and useful improvements in governors for controlling the speed of motors of various types and has as one of its objects to simplify and generally improve the construction of motor governors.

Another object of this invention resides in the provision of a governor for motors which is influenced by the velocity of the motor cooling fluid.

And a still further object of this invention is to provide an improved speed governor for motors which is in the nature of a vane or blade mounted on a counter-balanced arm and arranged to be influenced by the velocity of the motor cooling medium, the counter-balanced arm being in turn connected with the motor control.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawings, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a side view, partly in section and partly in elevation, of a motor equipped with my invention;

Figure 2 is a view, partly in section and partly in elevation, said view being taken through Figure 1 on the plane of the line 2—2, and

Figure 3 is a detail, fragmentary view of the yieldable means for setting the average maximum speed of the motor, said view being taken through Figure 2 on the plane of the line 3—3.

In the accompanying drawings, my invention is illustrated as applied to a single cylinder motor of the internal combustion type, comprising a base and crank case 5 and a cylinder 6 in which the usual piston, not shown, is engageable and is connected with a crank shaft 7 in the usual manner. The ends of the crank shaft 7 extend beyond the opposite sides of the crank case 5 and mount a pair of fly wheels 8 and 9.

While the wheel 8 functions as a fly or balance wheel, in the type of motor illustrated, it is primarily a blower equipped with fins or blades 10 for impelling cooling currents of air into contact with the radiating fins 11 of the engine cylinder. The wheel 9 also functions as a fly or balance wheel and may have a magneto, not shown, incorporated therewith. The wheels 8 and 9 are enclosed within blower housings 12 and 13, respectively, which extend upwardly to a point adjacent the top of the cylinder, the housings being provided with air inlets 14 adjacent the axes of the fly wheels. The housings 12 and 13 are preferably stamped from sheet material and have their inner ends closed by back plates 15 and 16, respectively, which extend upwardly to a point short of the housing upper ends to form air outlets 17 arranged to discharge the air impelled therethrough onto the engine cylinder.

The engine illustrated is equipped with the usual intake 18 with which a carburetor 19 is connected, the supply of fuel from the carbureter to the engine cylinder being controlled by a throttle valve 20 mounted on a throttle shaft 21, one end of which has a throttle plate 22 fixed thereto. The throttle valve 21 governs the speed of the motor and this invention contemplates the adjustment or actuation of the throttle by a governor influenced by the velocity of the cooling fluid through the housing 12.

The governor comprises an arm or lever 23 which is medially pivoted, as at 24, to a part 25 of the motor and has its inner end 26 enlarged or weighted to provide a counter-balance and its outer end extended into the blower housing 12 through a slot 27 in its plate 15. A vane or blade 28 is formed on the end of the governor arm extended into the housing 12 and is movable in a passageway formed in the housing by its adjacent side wall 29 and a baffle plate or partition 30. The blade 28 is so arranged as to intersect the currents of air passing through the housing 12 from the blower to the engine cylinder.

The weighted or counter-balanced end of the governor arm or lever is connected with the throttle plate 22 by a control link 31 hav-

ing one end pivotally connected with the governor arm or lever and its other end pivotally connected with the throttle plate at either of the several points 32. The throttle 20 is yieldably held in a set position by a spring 33 having one end 34 connected with a bracket 35 fixed to the crank case and its other end pivotally connectable with the throttle plate at any one of a number of points 36, the point 36 to which the spring is connected setting the maximum opening of the throttle.

The bracket 35 is frictionally held rigid by a mounting screw 37 so that it may be swung radially by loosening the screw, as will be apparent. In production, the aperture 36 in which the adjacent spring end is to be secured is decided upon and in testing the engines prior to shipping, the finer adjustments are made by means of the bracket. This affords a very quick and efficient adjustment.

The operation of my improved invention when applied to an internal combustion engine of the character described is as follows:

The spring 33 is connected with the throttle plate at the desired point and the engine started, the cooling fluid being impelled through the housings 12 and 13 onto the cylinder by the blower fins or blades 10. The speed of the motor has a direct ratio to the velocity of the cooling fluid through the housing 12 and should this velocity exceed a predetermined degree, i. e., impress a pressure on the under-side of the blade 28 sufficient to raise the adjacent end of the governor arm against the tension of spring 33, the throttle plate is rotated in a clockwise direction with respect to Figure 3. This rotation of plate 22 moves the throttle toward closed position and diminishes the speed of the motor to a point where the velocity of the cooling fluid drops sufficiently to permit the return of the governor arm and throttle to their normal set positions by the spring 30.

The governor blade or vane 28 working in the passage formed by the baffle plate 30 and the adjacent straight housing wall 29 prevents the occurrence of eddy currents which tend to disturb the action of the governor. This construction also permits the accurate setting of the governor arm and insures ready response of the governor to variations in the velocity of the cooling medium.

What I claim as my invention is:

1. The combination with a motor having a cylinder closed by a head and a throttle for controlling the speed thereof and an air impeller, of a one piece housing extending along one side of the motor to the head and closing the impeller, a partition in the housing forming air passages from the impeller to the motor, a medially pivoted lever having one end counter-balanced and the other end extended into one passage, a vane on the end of the lever in the passage, a throttle plate connected with the throttle, and a connection between the throttle plate and lever whereby movement of the arm by the influence of the air current on the vane actuates the throttle.

2. The combination with a motor having a cylinder closed by a head and a throttle for controlling the speed thereof and an air impeller, of a housing closing the impeller and having a passage leading therefrom to the cylinder head and open along its inner side in register with the cylinder, a medially pivoted lever having one end counter-balanced and the other end extended into said passage, a vane on the end of the lever positioned in the passage, a connection between the throttle and lever whereby movement of the arm due to the influence of the air current on the vane actuates the throttle, and yieldable means adjustably connected with the throttle to yieldably retain the same in a predetermined position of adjustment.

3. In a motor having a cylinder closed by a head, a speed controller and an impeller for giving velocity to a fluid for cooling the cylinder of the motor, an elongated housing having one end portion enclosing the impeller, said housing extending upwardly along the motor cylinder to the head and arranged to discharge the fluid impelled therethrough onto the cylinder throughout substantially its length to cool the same, means within the housing medially of its ends and in the path of the cooling fluid to be influenced by the velocity thereof, and a connection between said means and the motor speed controller whereby the motor speed is controlled by the velocity of the cooling fluid.

4. In an internal combustion engine including a crank case, a cylinder closed by a head and having radiating fins, a crank shaft extension projected outwardly of the crank case, an engine speed controller and an air impeller on the crank shaft extension and of a greater diameter than the cylinder and with its axis at right angles to that of the cylinder, a housing having its upper portion extended along one side of the cylinder to the head and its lowermost portion shaped to enclose the impeller, the portion of the housing above the impeller being taperingly reduced and having its inner side in communication with the engine cylinder whereby air impelled through the housing by the impeller is discharge onto the engine cylinder to cool the same, a partition within the housing and spaced from but substantially parallel with one side thereof to define an air passage through which a portion of the air from the im-

peller passes, a vane mounted within said passage and influenced by the velocity of air passing therethrough, and means connecting the vane with the engine speed controller whereby the speed controller is actuated according to the velocity of the air passing through the housing, said partition preventing the formation of eddying currents to disturb the functioning of the vane.

5. In a motor, a speed control shaft, a plate connected with the shaft, a controlling member, means adjustably connecting the controlling member with the plate to one side of the shaft, a contractile spring, means adjustably connecting one end of the spring with the plate at the other side of the shaft, a bracket member with which the other end of the spring is connected, and means adjusting the bracket whereby fine adjustments of the spring tension are made.

6. The combination with an internal combustion engine having an air impeller on the crank shaft thereof and a speed controller for the engine, of a housing of elongated shape and enclosing the impeller and extending upwardly along the engine cylinder, an air inlet for the housing adjacent the impeller, an air passage through the housing and through which air from the impeller is discharged onto the engine cylinder, and means located within the housing and connected with the engine speed controller to maintain the engine speed in direct relation with the velocity of cooling air.

7. In an internal combustion engine including a crank case, a cylinder, fly wheels located at opposite sides of the crank case and engine speed control means, air impellers carried by the fly wheels, housings enclosing the fly wheels and air impellers, extensions integral with said housings and extending along opposite sides of the engine cylinder, said extensions forming air passages for discharging air generated by the impellers onto the engine cylinder to cool the same, and means located within one housing and influenced by the velocity of air therethrough to control said engine speed controller.

8. In an internal combustion engine including a crank case, a cylinder, fly wheels located at opposite sides of the crank case and engine speed control means, air impellers carried by the fly wheels, housings enclosing the fly wheels and air impellers, extensions integral with said housings and extending along opposite sides of the engine cylinder, said extensions forming air passages for discharging air generated by the impellers onto the engine cylinder to cool the same, a partition in one housing extension to divide the same into air passages, a vane located within one of said air passages and adapted to be influenced by the velocity of air passing therethrough, and a connection between said vane and the motor speed controller.

In testimony whereof I affix my signature.

PERRY E. MACK.