

Jan. 22, 1946.

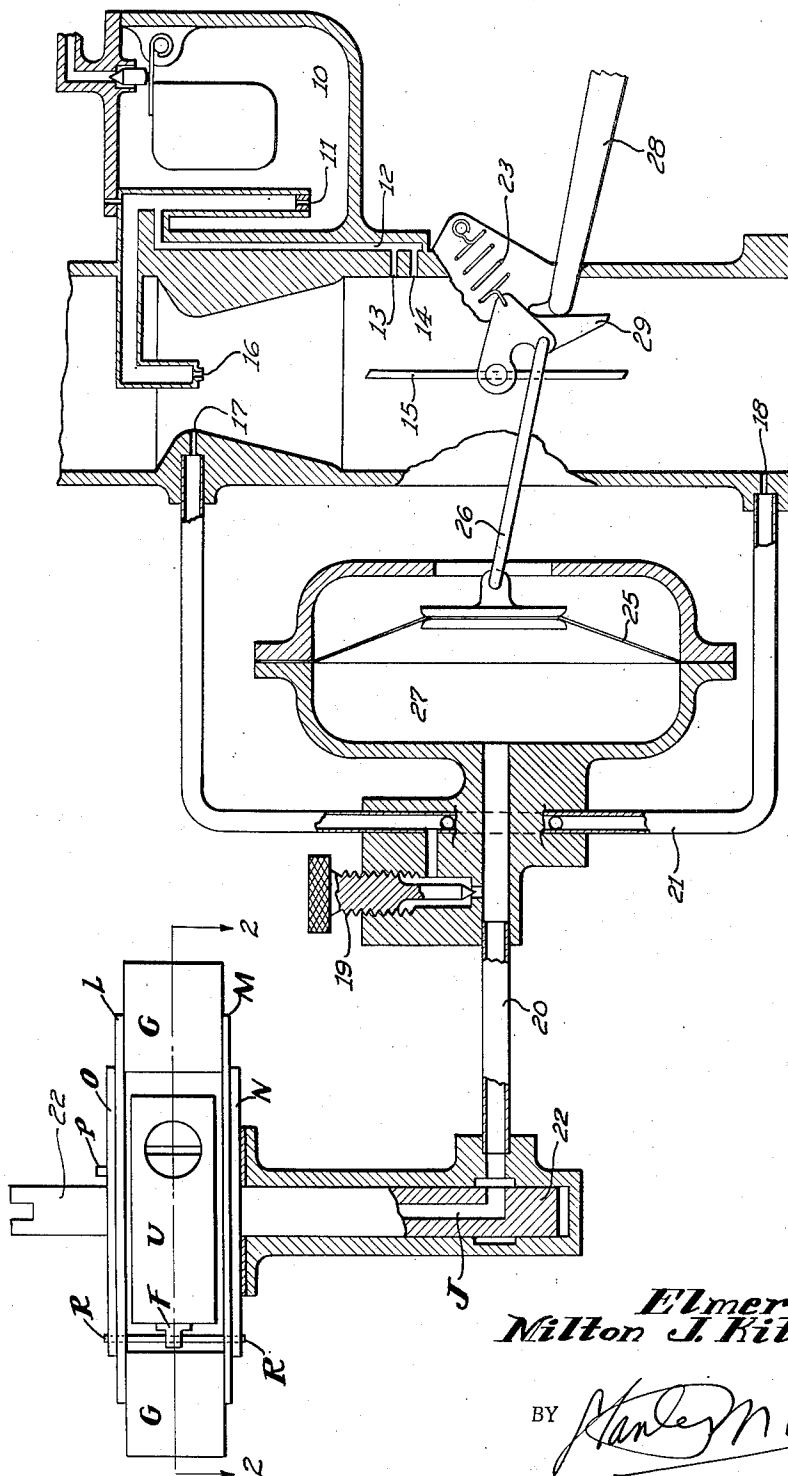
E. OLSON ET AL

2,393,556

GOVERNOR

Filed Jan. 8, 1944

2 Sheets-Sheet 1



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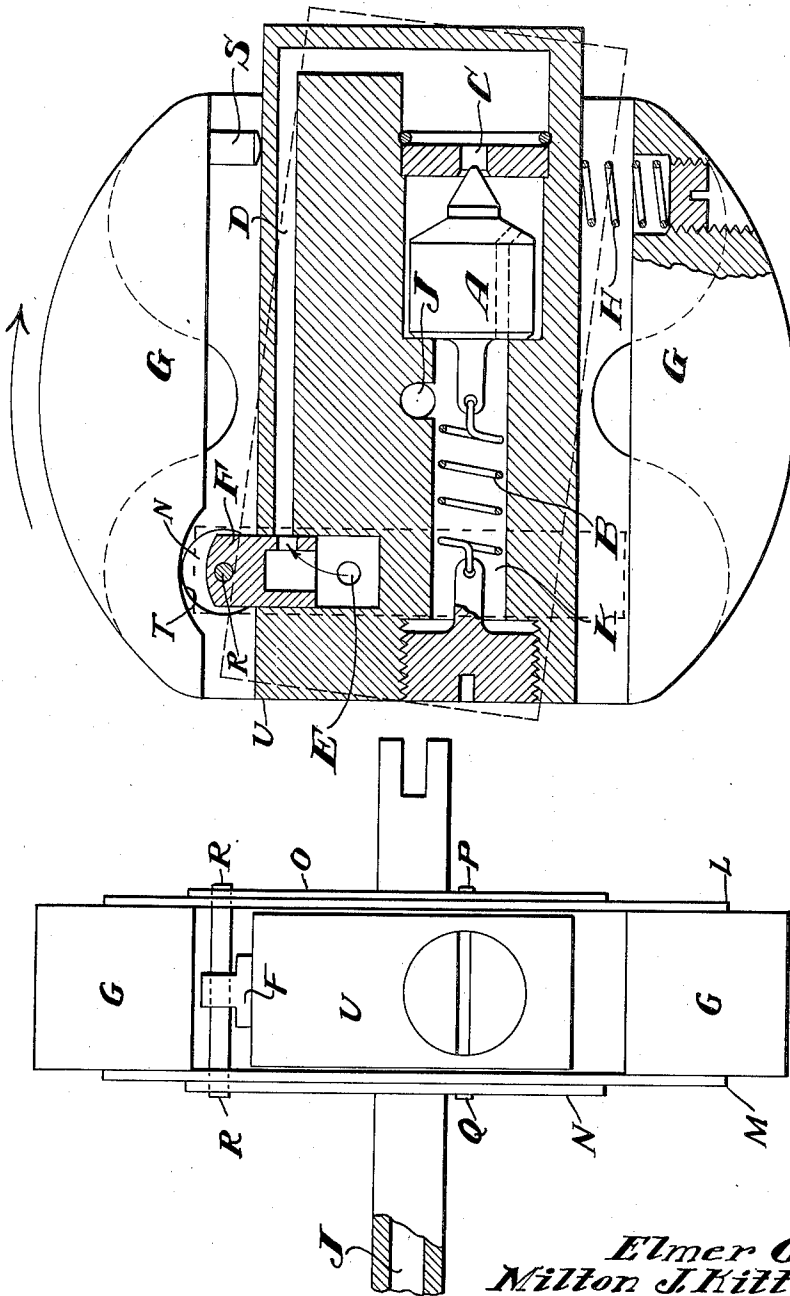


Fig. 2

Fig. 3

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GOVERNOR

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Application January 8, 1944, Serial No. 517,592

1 Claim. (Cl. 123—103)

The object of this invention is to modify the action of a centrifugal governor so that it is responsive to both the revolutions per minute of the engine and to the rate of change of the number of revolutions per minute. If a centrifugal governor is subjected to a severe test, that is to say, if the load is completely thrown off at a given instant, the engine necessarily increases beyond the governed speed because when the engine reaches the governed speed, it is accelerating and therefore during the period of time that the governor acts, the engine speed exceeds the governed speed. This difference between the governed speed and the actual speed at which the engine is checked by the governor when the load is thrown off is known as the over-run. Obviously it is desirable that the normal governed speed should not differ greatly from the governed speed when the engine is accelerated.

During acceleration, in addition to centrifugal force there is available the inertia force and therefore it is desirable to make the centrifugal and the inertia forces cooperate so that the governor acts promptly and before the engine has reached any excessive speed. The acceleration forces are utilized to anticipate the action of the centrifugal forces.

Fig. 1 shows the general arrangement of our invention.

Fig. 2 shows the cross-sectional plan view on the plane 2—2 of Fig. 1.

Fig. 3 shows the elevation of Fig. 2.

In Fig. 1, a carburetor is shown on the right hand side having a float chamber 10, and a fuel nozzle 11 discharging through the low-speed passage 12 into the outlets 13 and 14, and thus into the mixture outlet adjacent to the upstream lip of the butterfly throttle valve 15. The fuel nozzle 16 supplies the fuel for high speed operation. A restriction 17 in the throat of the venturi in the air entrance, communicates with the restriction 18 located in the mixture outlet, through the bypass 21. This bypass 21 communicates with a passage 20, through an orifice which is controlled by an adjustable needle valve 19. The vacuum in the venturi and in the mixture outlet are jointly communicated past this adjustable restriction 19 to a chamber 27, the right hand wall of which is formed by a diaphragm 25. A link 26 is connected to the throttle 15, which is also controlled by a tension spring 23. The result is that the throttle is held wide open by the spring 23, except when the suction in the chamber 27 is powerful enough to overcome the spring 23.

Shaft 22 is driven proportional to engine speed,

and controls an atmospheric vent C shown in Fig. 2 which supplies atmospheric pressure through the pipe J to passage 20 at low speed and hence permits the throttle 15 to become wide open.

For manual control below governed speed, a rod 28 engages with the element 29 mounted on the throttle 15, and positively closes the throttle. When the critical speed of the engine is exceeded, the air vent leading to passage J is closed, and the vacuum is permitted to build up in the chamber 27 and the throttle 15 is closed automatically.

Fig. 2 shows our specific invention in which a centrifugal weight A stretches a spring B and closes an orifice C. The orifice C communicates through the passage D with the atmosphere at vent E. The valve F is normally open but may be closed by inertia forces. The parts A, B and C, are all contained in a block U rigidly connected to the shaft 22. Loosely mounted on the shaft J are two plates L and M, which hold between them two similar weights GG. A spring H engages with the right-hand side of a block U (Figure 2) which is pushed against a stop S, which engages with the left-hand side of the block U. A pin R is carried by the rocking levers N and O. Lever O is pivoted at P to the plate L. Lever N is pivoted at Q to the plate M. An opening T in the plates L and M permits some movement of the pin R relative to the plates L and M.

Operation

On the plates L and M are mounted the rocking plates N and O, which carry the pin R. The weights GG are also carried by the plates L and M, so that any movement of the weights relative to the shaft 22 and block U, causes the pin R to move the valve F and cut off communication between the opening E and passage D.

In the view shown in Figure 2, rotation is clockwise. Hence, the valve F is closed during acceleration because the weight G lags behind the engine driven parts and moves the valve F downwardly, cutting off communication between the shaft passage J connected to the inlet vacuum and the atmospheric vent E. The spring H is compressed during acceleration, so that during acceleration the vacuum admitted through the center of the shaft passage J into the chamber K, is cut off from the atmosphere just as it is at high speed by the centrifugal weight A, so that the governor responds both to high engine speed and to excessive acceleration. This causes the throttle to close so that when the

load is thrown off and the engine tends to race, the inertia element anticipates the action of the centrifugal element, so that the over-run is reduced.

What we claim is:

In a centrifugal governor for an internal combustion engine having a throttle and a spring adapted to open said throttle, manual means for closing said throttle, automatic means for closing said throttle responsive to the suction in the 10
air entrance to said engine, an atmospheric air

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vent admitting air to said suction responsive means whereby said suction responsive means are rendered inoperative to close the throttle, centrifugally operated means for closing said atmospheric air vent, inertia responsive means adapted to also close said atmospheric vent, so that whenever the rate of acceleration exceeds a given value the throttle is closed.

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