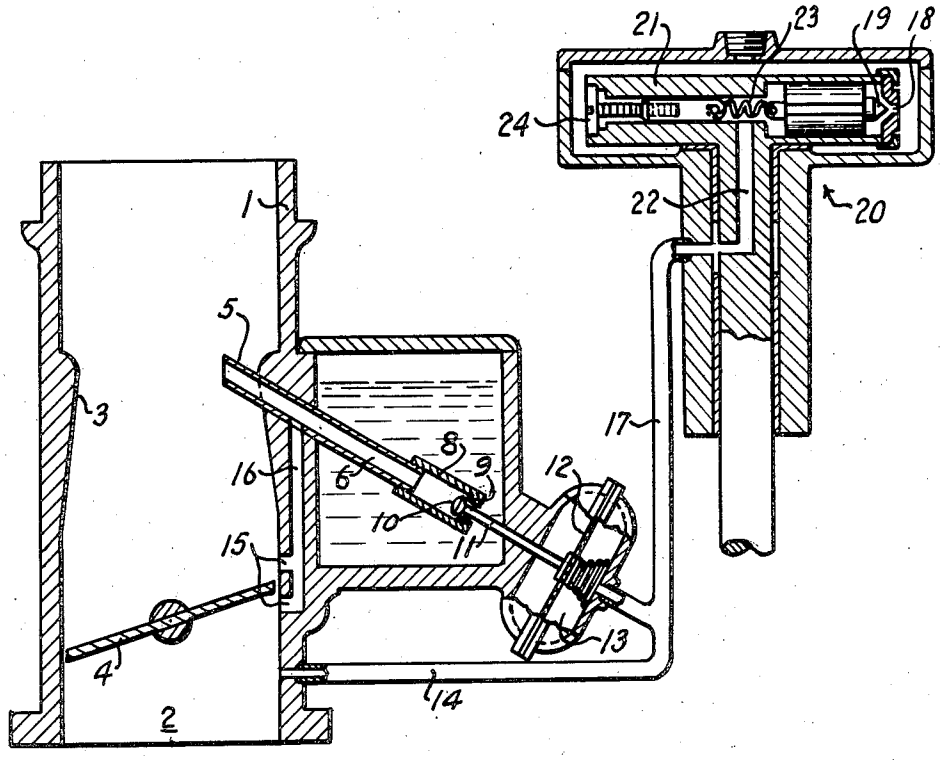
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SPEED CONTROL FOR INTERNAL-COMBUSTION ENGINES

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SPEED CONTROL FOR INTERNAL-COMBUSTION ENGINES

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This invention relates to means for stopping or slowing down the running of an internal combustion engine when a predetermined speed has been attained.

It has heretofore been the practice to control the speed of internal combustion engines by speed governors which actuated the carburetor throttle or a central throttle to reduce the fuel supply to the engine when a predetermined speed has been reached. This form of control is objected to by automobile fleet owners for the reason that the horsepower of the engine is reduced before the speed limit is reached, whereas it is desired to maintain the full horsepower right up to the point where the permissible engine speed is reached.

The object of the present invention is to obviate this objection to the use of speed control governors for internal combustion engines by the provision of means in connection with the carburetor that is automatically actuated to completely stop the flow of fuel to the carburetor throat when, and not until, a predetermined engine speed has been reached so that full engine horsepower is maintained right up to the engine speed limit desired.

The invention is fully described in the following specification and one embodiment thereof illustrated in the accompanying drawing, which is a central longitudinal section of an apparatus embodying the invention with parts in full and with both the fuel feed control valve and the air vent control valve open.

Referring to the drawings, 1 designates a carburetor casing forming a fuel feed throat or passageway 2 to an associated engine (not shown) and having the customary venturi restriction 3 therein. Inward from this restriction is the customary throttle valve 4. A fuel feed nozzle 5 is projected into the fuel feed passageway 2 adjacent to the inlet end of the restriction 3 and the channel 6 of this nozzle extends into the carburetor fuel bowl 7 and is provided therein with a valve casing 8 having an internal valve seat 9 therein. A valve 10 operates in the casing and seats outwardly against the seat 9 to close the bowl communication with the nozzle tube or channel 6.

The stem 11 of the valve 10 is attached to a diaphragm 12 in a suction chamber 13 and normally holds the valve in open position. The outer side of this diaphragm is subjected to suction from the interior of the passageway 2 to the engine at the engine side of the throttle valve 4 through a tube or channel 14 so that the rush of

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the fuel mixture through the passageway 2 to the engine cylinders during the running of the engine will create a suction in said channel 14 and chamber 13, tending to draw the diaphragm 12 outward. This movement of the diaphragm draws the valve 10 outward against the seat 9 and stops the flow of fuel to the nozzle 5 and also to the idler jets 15 which are fed through a channel 16 from the nozzle channel 6.

The suction tube 14 also has a vent passage 17 that is normally open to the atmosphere through a vent opening 18 that is controlled by a normally open centrifugally operated governor valve 19. It is thus apparent that the relief valve 19 is normally open so that bleeding of the suction line occurs and the carburetor valve 10 is permitted to remain open until the engine reaches a predetermined speed. When this occurs, the relief valve 19 closes and suction is built up in the chamber 13 to draw the carburetor valve 10 into engagement with the seat 9 and to stop the fuel feed to the carburetor nozzle.

The governor 20 which controls the closing of the vent 18 has a rotatable member 21 driven by the engine and has the vent opening 18 therein to which a vent passage 22 leads. The passage 22 is provided within said member with a valve chamber in which the weighted portion of the valve 19 operates, and the outer end of this chamber is provided with vent opening 18. The valve 19 is normally held in inwardly retracted open position by a spring 23 tensioned to permit the valve to move outward and close the vent opening when a predetermined engine speed has been reached. A tension adjusting screw 24 is mounted in the member 21 and connected to the spring.

It is apparent that under normal operating conditions of the engine below a speed of say 3,000 R. P. M., the vent valve 19 remains open so as to bleed the suction channel 14 and the suction side of the chamber 13. This permits the diaphragm 12 in said chamber to remain in normal position with the carburetor valve 10 open. When the engine speed reaches the speed limit at which the governor spring 23 is set, the valve 19 will move outward by centrifugal action and close the vent opening 18. This stops the admission of atmospheric air to the suction passages 14 and 17 and the chamber 13 so that suction quickly builds up in the chamber 13 sufficient to draw the valve 10 to its seat 9, thereby closing the passage 6 to the main and idler jets 5 and 15 of the carburetor and completely stopping the flow of fuel therethrough.

It is apparent that with this control, full horsepower operation of the engine is possible right up to the point where the engine checking speed is reached, which is an important feature.

Upon a stoppage of the fuel flow to and from the main and idler feed orifices, the fuel that had gone into the engine would all be burned and there would be no fuel in the muffler to cause backfire or explosions. The engine would simply quit or slow down every time the operator tried to overspeed, the same as if he ran out of gasoline, but there would be no effect whatever on the power below the limit speed.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

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

1. The combination with an internal combustion engine having a fuel feed passageway to its cylinders, and a carburetor for feeding fuel to said passageway and comprising a fuel supply source, a main nozzle orifice opening into the passageway with a channel communicating with said source and through which fuel is drawn to said orifice by suction action in the passageway, and a throttle at the suction side of said nozzle, of a valve for closing said channel and normally standing in open position, and means operable by suction action in said passageway and by engine speed to close said valve and stop the fuel flow to the nozzle when the engine has reached a predetermined open throttle speed.

2. The combination with an internal combustion engine having a fuel feed passageway to its cylinders and a carburetor for feeding fuel to said passageway and comprising a fuel supply bowl and a nozzle orifice into the passageway from said bowl with a channel communicating therewith and through which fuel is drawn by suction action in the passageway, of a valve for closing said channel and normally standing in open position, means connected to said valve and operable by suction action in said passageway to close said valve and stop the flow of fuel to the nozzle, and means operated by the engine for preventing said last means from acting to close the valve short of a predetermined speed of the engine.

3. The combination as called for in claim 2

wherein said last means comprises a relief channel in communication with said valve closing means, a normally open relief valve for closing said relief channel, and means rotatably driven by the engine and carrying said relief valve to cause it to act by centrifugal action to close the relief channel when the engine reaches a predetermined open throttle speed.

4. The combination with an internal combustion engine having a fuel feed passageway to its cylinders and a carburetor for feeding fuel to said passageway and comprising a fuel supply source and one or more nozzle jets having their channels in communication with said source and through which fuel is drawn by suction action in the passageway, of a normally open valve for closing said channel, a suction chamber having communication with said passageway, a diaphragm in said chamber connected to said valve and operable by suction in the passageway to close said valve, and means operable by the engine to relieve the valve closing suction action on the diaphragm until the engine reaches a predetermined open throttle speed.

5. The combination as called for in claim 4 wherein said last means includes a centrifugally operated valve for closing a relief from said chamber when a predetermined engine speed is reached.

6. The combination with an internal combustion engine having a carburetor with a fuel bowl and a nozzle with its channel in communication with said bowl and through which fuel is drawn to the engine by suction action, of a normally open valve movable to close said channel, means operable by an engine created suction action to close said valve, and means operable by the engine for preventing said last means to act to close the valve until the engine has reached a predetermined speed.

7. The combination as called for in claim 6 wherein the last means includes a centrifugally operated pressure relief valve.

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