

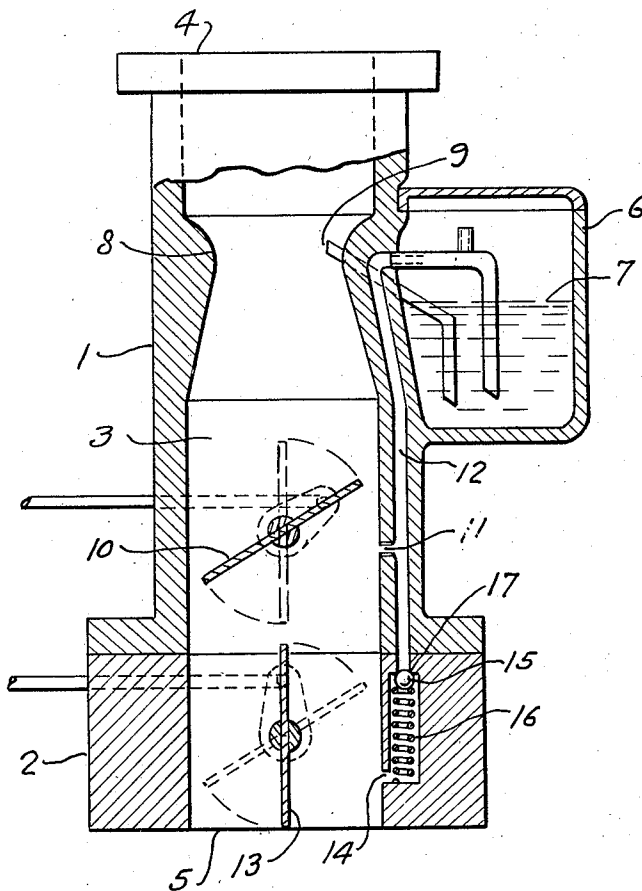
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M. MALLORY

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CARBURETOR FOR INTERNAL-COMBUSTION ENGINES

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INVENTOR.

Marion Mallory

BY

Barnes, Kisselle, Laughlin & Laisch
Attorneys

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CARBURETOR FOR INTERNAL-COMBUSTION ENGINES

Marion Mallory, Detroit, Mich.

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5 Claims. (Cl. 123—123)

This invention relates to a carburetor for an internal combustion engine.

In the conventional carburetor an idle jet is provided on the engine side of the throttle valve which supplies all the fuel when the engine is idling because there is not enough air flowing by the main jet in the venturi to draw fuel therefrom. When the throttle is moved toward open position the velocity of the air flowing by the main jet in the venturi increases and draws fuel from the main jet but the idle jet continues to flow fuel until the throttle has moved toward open position a considerable distance. The fuel feeding from the idle jet as the throttle opens adds to the fuel feeding out of the main jet in the partly opened throttle range to make a mixture of proper proportions for the engine. When a sandwich governor is positioned between the carburetor and the engine, under certain conditions the feeding of fuel from the idle jet is upset and the mixture becomes too lean. For example, if the main carburetor throttle is held wide open and the governor valve closes, there will be little or no suction around the idle jet and the only fuel fed to the engine will come from the main jet. Further, since the air velocity by the main jet will be low, insufficient fuel will be drawn from the main jet and the mixture will become too lean.

It is an object of this invention to produce a carburetor which can be used with an engine speed governor and which will remedy the above pointed out defects and at all times supply correct fuel mixtures to the engine as required by operating conditions.

This object is obtained by the provision of an idle bypass fuel jet between the governor valve and the engine through which fuel is supplied to the engine when the governor is almost closed.

The drawing is a vertical section showing my carburetor.

The parts of my carburetor are as follows: carburetor housing 1, governor body 2, intake passageway 3 having air inlet 4 and fuel mixture outlet 5 to the engine, float bowl 6, fuel level 7, venturi 8, main jet 9, manually controlled throttle 10 preferably of the butterfly type, idle jet 11, fuel passageway 12 between the idle jet and the float bowl, automatically controlled governor valve 13, idle bypass jet 14 on the engine side of governor valve 13, check valve 15, compression spring 16 tending to hold valve 15 against seat 17.

It is understood that governor valve 13 is automatically operated and may be any of the known automatically operated types of governor such as the unbalanced velocity type governor valve, the

engine driven centrifugal weight actuated type of governor, or the intake passageway pressure actuated governor such as shown in my copending application Serial No. 466,961, filed November 25, 1942.

The operation of my carburetor is as follows: Assuming that the engine is running at low speed and being controlled by the main carburetor throttle 10, there will be a sufficient vacuum or suction at idle orifice 11 which will draw fuel through channel 12 out of bowl 6. When controlling the engine with the carburetor throttle 10 at idle or partly open throttle condition, the suction at orifice 11 will be as high as it is at orifice 14 and therefore ball check 15 will be held closed against seat 17 by spring 16 because the vacuum or pressure above and beneath the valve will be substantially equal. If throttle valve 10 is now held wide open, as indicated in the dotted lines, and the governor starts to check the engine speed and closes to a position, for example, as shown in the dotted lines, then orifice 11 will be near, or at substantially atmospheric pressure, and orifice 14 will be in the vacuum or sub-atmospheric pressure obtaining in the intake passageway on the engine side of governor valve 13. The vacuum at orifice 14 will now draw check valve 15 downwardly off seat 17 and fuel will now be drawn through passageway 12 and out of bypass idle jet 14 which will be added to the lean mixture coming out of the main jet 9 to give the properly proportioned fuel mixture under such operating conditions. Check valve 15 will remain closed on seat 17 at all times except when the carburetor throttle valve is opened far enough and governor valve 13 is closed far enough whereby orifice 11 is in a higher pressure than the pressure obtaining at orifice 14. In other words, whereby orifice 11 will be in a high pressure area and orifice 14 in a low pressure area.

I claim:

1. In a carburetor for an internal combustion engine having an intake passageway, two throttle valves mounted in series in the intake passageway, an idle jet in the intake passageway between said valves, a second idle jet in the intake passageway on the engine side of said valves, a source of fuel connected to said jets, and means actuated by changes of pressure in the intake passageway for controlling communication between said idle bypass jet and said source of fuel, said pressure actuated means responding to open communication between the bypass fuel jet and its source of fuel when the pressure obtaining in the intake passageway at said bypass jet is lower

than the pressure obtaining at the idle jet whereby fuel is drawn from the bypass jet into the intake passageway.

2. In a carburetor for an internal combustion engine having an intake passageway, first and second independently operatable throttle valves in said intake passageway, said second throttle valve being positioned on the engine side of the first throttle valve, an idle jet in the intake passageway between said throttle valves, an idle bypass jet on the engine side of said second throttle valve, a source of fuel, a passageway connecting said idle jets with each other and with said source of fuel, pressure actuated valve means in said passageway between the idle jet and the bypass jet opening in response to a difference in pressure in the intake passageway at the idle jet and bypass jet such as occurs when the first throttle is substantially wide open and the second valve is partly closed so that the intake passageway pressure at the idle jet is substantially atmospheric and a vacuum obtains in the intake passageway at the bypass jet whereby fuel is drawn into the intake passageway through the bypass idle jet.

3. In a carburetor for an internal combustion engine having an intake passageway, first and second independently operatable throttle valves in said intake passageway, said second throttle valve being positioned on the engine side of the first throttle valve, an idle jet in the intake passageway between said throttle valves, an idle bypass jet on the engine side of said second throttle valve, a source of fuel, a passageway connecting said idle jets with each other and with said source of fuel, a check valve in said passageway between the idle jet and the bypass jet arranged to open in response to intake passageway suction on the engine side of said second valve when the pressure obtaining in the intake passageway at said bypass jet is lower than the pressure obtaining at the idle jet whereby fuel is drawn from the bypass jet into the intake passageway, and resilient means tending to hold said check valve closed.

4. In a carburetor for an internal combustion engine having an intake passageway, two throttle valves mounted in series in the intake passage-

way, an idle jet in the intake passageway between said valves, a second idle jet in the intake passageway on the engine side of said valves, a source of fuel connected to said jets, and means actuated by changes of pressure in the intake passageway for controlling communication between said idle bypass jet and said source of fuel, a venturi in said intake passageway on the atmosphere side of said throttle valves, a main jet positioned in said venturi, a source of fuel connected to said main jet whereby the flow of air through said venturi tends to draw fuel from said main jet at a rate of flow increasing with the velocity of the air flowing through said venturi, said pressure actuated means responding to open communication between the bypass fuel jet and its source of fuel when the pressure obtaining in the intake passageway at said bypass jet is lower than the pressure obtaining at the idle jet whereby fuel is drawn from the bypass jet into the intake passageway.

5. In a carburetor for an internal combustion engine having an intake passageway, a venturi in said intake passageway, first and second independently operatable throttle valves in said intake passageway on the engine side of said venturi, said second throttle valve being positioned on the engine side of the first throttle valve, a main jet in said venturi, an idle jet in the intake passageway between said throttle valves, an idle bypass jet on the engine side of said second throttle valve, a source of fuel, a passageway connecting said idle jets with each other and with said source of fuel, a passageway connecting said main jet with said source of fuel, pressure actuated valve means in said passageway between the idle jet and the bypass jet opening in response to a difference in pressure in the intake passageway at the idle jet and bypass jet such as occurs when the first throttle is substantially wide open and the second valve is partly closed so that the intake passageway pressure at the idle jet is substantially atmospheric and a vacuum obtains in the intake passageway at the bypass jet whereby fuel is drawn into the intake passageway through the bypass idle jet and commingles with fuel drawn from the main jet.

MARION MALLORY.