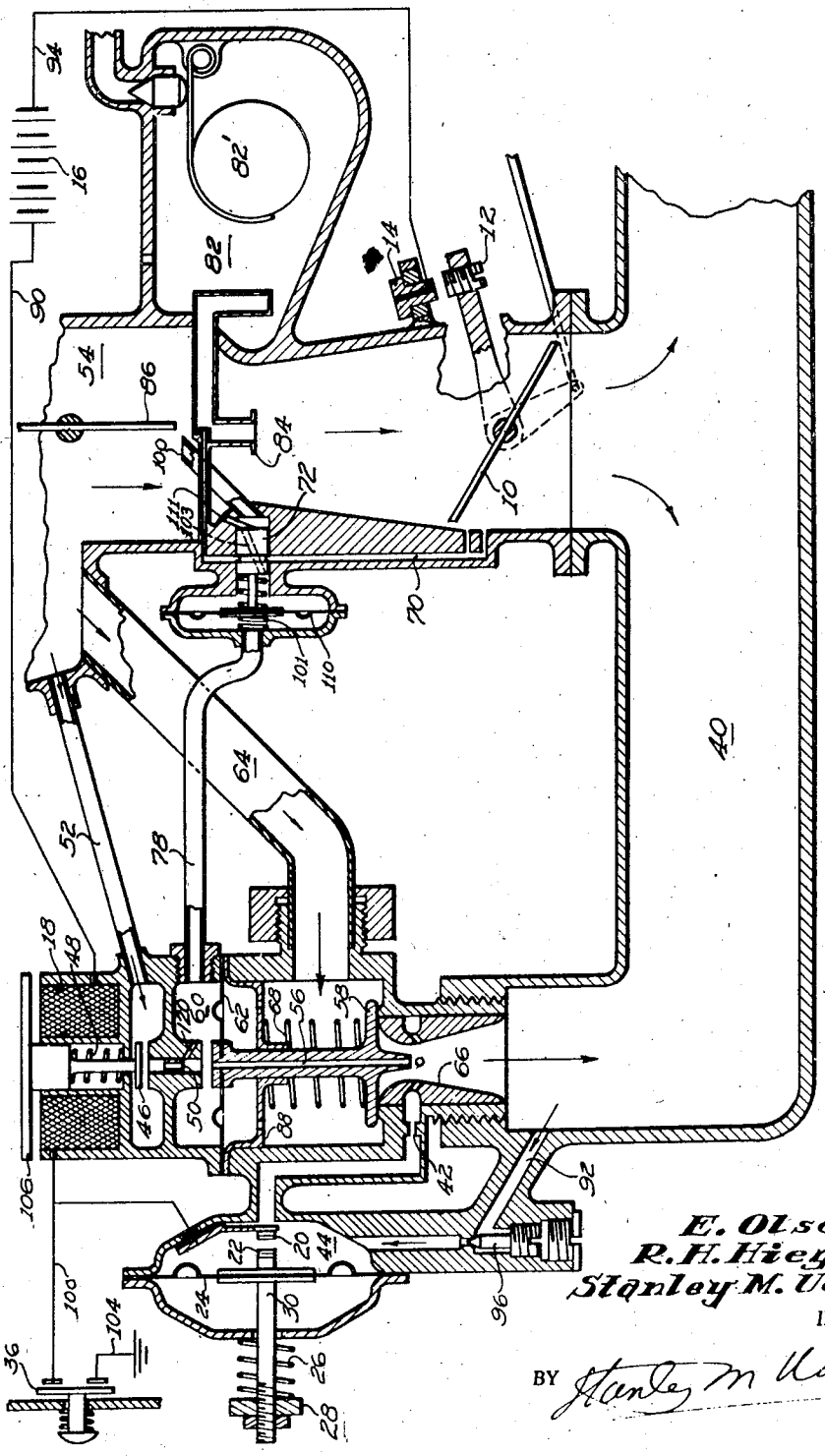
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DECELERATOR

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DECELERATOR

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The object of this invention is to supply air to the inlet manifold of an automobile engine whenever the throttle is closed and the car is running at some considerable speed so as to create a high vacuum in the inlet manifold and to hold the valve open that admits the air to the manifold until the depression in the inlet manifold has dropped considerably below the suction at which the decelerating valve is first opened to admit air during deceleration.

An additional object is to cut off the supply of low-speed fuel during deceleration.

The drawing shows the preferred form of our invention.

In the drawing, 10 is the throttle controlling the outlet from a carburetor and the inlet to an inlet manifold 40, 12 is the adjustable low-speed stop, which also acts as a ground for the fixed stop 14, which is insulated. The ground 14 is connected through an electrical connection 94 to the right-hand side of a battery 16. The left-hand side of this battery is connected through a conductor 90 through coil 18 to another ground connection 100, which is either grounded at 104 or at 22. An armature 106, when the coil is active, is drawn down by the action of the coil 18; a spring 48, which normally lifts a valve 46, is thus compressed, causing the valve 46 to seat. The valve 46 controls the flow of air through a restricted opening 50. Pipe 52 conveys clean air from the air entrance 54 to the restriction 50 when the valve 46 is lifted off its seat by spring 48. An inclined passage 120 places the chamber 60, above the diaphragm 62, at all times in communication with the passageway 56 in the center of the valve 58.

The chamber 60, above a flexible diaphragm 62, is subjected to the suction in the inlet manifold 40 through the restricted passage 56, which is located in the center of the valve 58. The lower side of diaphragm 62 is subjected to atmospheric pressure through partition 88. The valve 58 is controlled by spring 68 and it, in its turn, controls the entrance to the venturi 66. Venturi 66 discharges into the inlet manifold 40 and is supplied with clean air from the air entrance 54 through the passage 64. The throat of the venturi 66 communicates through a restriction 42 with a chamber 44; chamber 44 also communicates directly with the inlet manifold 40 through a passage 92. The connection through the passage 92 is restricted by an adjustable needle 96. The needle valve 96 is adjusted so that there is a very slight flow of air from the inlet manifold 40, past the valve 96, into the chamber 44 down the passage 42, into the throat of the venturi 66 when the valve 58 is open. The depression acting on the right hand side of the diaphragm 24, when the valve 58 is open, is thus less than the depression existing in the throat of the venturi 66. If the valve 58 remains open too long the engine may stall. Hence, to prevent "stalling" the valve 96 is opened slightly but never at any time is the valve 96 opened wide. A stationary contact 20 is insulated and connected through a conductor to the ground connection 100 of the coil 18. The movable contact 22 is carried by the diaphragm 24, and when it moves to the right under the influence of the suction in the venturi 66, it compresses the spring 26 by means of the adjustable nut 28 and the rod 30. The connection to contact 20 may also be grounded through the conductor 100 and the ground connection 104 whenever an element 36 is manually pushed to the right.

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The float chamber 82 supplies fuel to a fuel nozzle 84 and to a low-speed fuel passage 70; a diaphragm 110 controls a valve 72. The left-hand side of the diaphragm 110 is connected through pipe 78 to chamber 60. The right-hand side of the diaphragm 110 is connected through pipe 100 to the pressure of the air in the air entrance 54. A spring 101 pushes the diaphragm 110 to the right against a stop 111, under normal operating conditions. An inclined passage 103 is provided in valve 72 for the purpose of transmitting atmospheric pressure in the air entrance 54, from the tube 100, to the right hand side of the diaphragm 110.

Operation

When the throttle 10 closes, the car drives the engine and creates a high degree of suction in the manifold 40. At the same time, the adjustable stop 12 engages with the insulated stop 14 and thus grounds the right-hand end of the battery 16. The left-hand end of the battery 16 is connected through the conductor 90 to the solenoid 18 to the stationary contact 20, which is grounded by the movable contact 22, which is moved by the diaphragm 24, which is moved to the right by the suction in the manifold 40. This action compresses the spring 26, which engages with the cap 28 of the rod 30.

The manually-operated switch 36 grounds the connection 100 through the ground connection 104. Hence, the coil 18 is operated whenever the throttle 10 is closed and the contact 22 engages with the contact 20. The solenoid 18 is also operated when the switch 36 is pushed to the right whenever the throttle 10 is closed. When the throttle 10 is shut quickly, a high degree of suc-

tion is formed in the inlet manifold 40. This high degree of suction if conveyed past the restriction 42 to the chamber 44, and the diaphragm 24 responds to this suction and moves the contact 22 to the right so that it engages with the contact 20 and thus grounds the left-hand side of the solenoid 18. Immediately the suction in the inlet manifold 40 is transmitted through the passage 56 in the center of the valve 58 to the chamber 60. The diaphragm 62 rises and air is admitted from the air entrance 54, through the passage 64, through the venturi 66, to the manifold 40. The suction in the throat of the venturi 66, which is higher than the manifold suction in 40, is conveyed through the passage 56 so as to maintain the suction in the chamber 60 during the time valve 46 is held down.

The suction in the venturi 66 is conveyed through the restriction 42 to the chamber 44 to maintain the suction in the chamber 44. Although air at atmospheric pressure is admitted through the venturi 66, and, therefore, the suction in the inlet manifold 40 falls rapidly, the suction in the chambers 44 and 60 is maintained, and, thus, the suction in the inlet manifold 40 can drop from 22" of mercury to 11" of mercury before the spring 26 separates the contact 22 from contact 20. When the suction falls to such a degree that the suction in 44 no longer maintains the contact between 22 and 20, the solenoid 18 quits functioning and then the spring 48 opens the valve 46 and atmospheric air flows down the passage 52, through the restriction 50, into the chamber 60, and the spring 68 closes the valve 58.

Meanwhile, during the period of deceleration, when air was admitted through the passage 66, the fuel flowing down the low-speed passage 70 is interrupted by the piston 72, which is moved to the left by the suction in the chamber 60, acting on the diaphragm 110 through the passage 78. The passage 100 admits atmospheric pressure to the right of the diaphragm 110, compressing spring 101. A passage 103 through the piston 72 permits the pressure in the air entrance 54, transmitted through the pipe 100, to move the piston 72 by acting on the diaphragm 110 and compressing the spring 101. The float chamber 82 is vented to the atmosphere and contains the float 82^1, which supplies fuel to the nozzle 84 and also to the low-speed passage 70. An ordinary choke valve 86 is shown located in the air entrance 54.

The carburetor itself forms no part of this invention, and, hence, only a conventional drawing of the carburetor is made.

This application is based in part on an abandoned application bearing the Serial Number 439,777 and filed April 20, 1942.

What we claim is:

1. In combination with an internal combustion engine, a carburetor having an air entrance, an air passage connected therewith, a fuel supply means, a fuel nozzle connected therewith and discharging into the air passage, a throttle valve controlling the flow of mixture out of said passage, an additional air entrance on the engine side of said throttle, a venturi in said air entrance, an air valve controlling the air entrance to said venturi, means responsive to the suction on the engine side of said throttle valve for opening the air valve controlling the air entrance to said venturi, said means being adapted to also respond to the suction in the throat of said venturi after the air valve controlling the flow through said venturi has been opened to hold said air valve open.

2. A device as set forth in claim 1 in which there is a low-speed fuel passage leading from the fuel nozzle to the engine side of said throttle valve, a fuel valve in said passage, means responsive first to the suction on the engine side of the throttle and then to the suction in said venturi for first moving said fuel valve into the closed position, and, when the air valve controlling the air entrance to said venturi is open, holding the fuel valve in its closed position during the deceleration period of said engine.

3. In combination with a carburetor for an internal combustion engine having an air entrance, an air passage connected therewith, a fuel supply means, a fuel nozzle connected therewith and discharging into the air passage, a throttle valve controlling the flow of mixture out of said passage, an additional air entrance located on the engine side of said throttle, a venturi in said air entrance, an air valve controlling said air entrance, a chamber, a moving wall therein connected to said air valve, a passage connecting the said chamber with the throat of said venturi whereby the suction in said venturi acts on said moving wall so as to open said air valve, spring means adapted to close said air valve, a port for admitting air to said chamber, a valve for said port, electromagnetic means connected to said port valve, an electric battery, an electric circuit connected thereto and to said electromagnetic means, a throttle operated first switch, a second switch operated by the inlet manifold suction, said second switch being adapted to be closed by venturi suction, said first switch being closed when the throttle is closed, said first and second switch being located in series in said electric circuit.

4. A device as set forth in claim 3 in which there is a low-speed fuel passage leading from the fuel nozzle to the engine side of said throttle valve, a fuel valve in said passage, means responsive first to the suction on the engine side of the throttle and then to the suction in said venturi for first moving said fuel valve into the closed position, and, when the air valve controlling the air entrance to said venturi is open, holding the fuel valve in its closed position during the deceleration period.

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