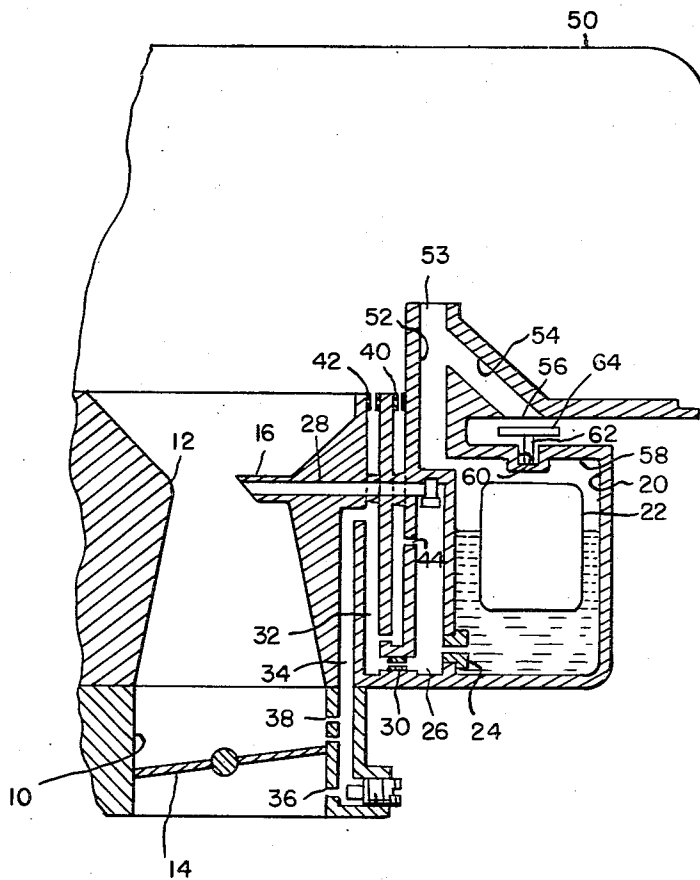


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CARBURETOR ASSEMBLY
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CARBURETOR ASSEMBLY

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The present invention relates to a carburetor assembly, and more particularly to a carburetor assembly adapted to avoid difficulties previously encountered as a result of percolation resulting from hot soaking.

More specifically, it is an object of the present invention to provide in a carburetor having an air cleaner, an air passage extending from the float bowl to a point within the air cleaner adjacent the inlet to the carburetor barrel, and a check valve controlled vent in the air passage communicating with atmosphere.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings, wherein:

The figure is a diagrammatic sectional view of a portion of a carburetor.

Referring now to the drawings the invention is illustrated in conjunction with a carburetor of conventional type herein illustrated as comprising a barrel 10 provided with a venturi the throat of which is indicated at 12. Flow of air through the barrel is controlled by a throttle 14 and a main nozzle 16 is provided adjacent the throat of the venturi.

The carburetor construction comprises a bowl or float chamber 20 having a float 22 therein controlling an inlet valve (not shown) adapted to maintain the level of fuel substantially as illustrated in the drawing.

Adjacent the bottom of the bowl 20 is a main jet 24 providing a restricted inlet into the main well 26. At its upper end the main well communicates with a main fuel supply passage 28 extending to the nozzle 16. An idle jet 30 communicates with an idle well 32 which in turn communicates with the idle fuel supply passage 34 extending to idle and transfer ports 36 and 38 respectively. Main and idle air bleeds are indicated at 40 and 42 respectively, the main air bleed communicating with the main well by a transverse passage indicated at 44.

Associated with the carburetor is an air cleaner 50 of usual type which is filled with air filtering material adapted to filter dust and other particles out of air as it is drawn into the inlet end of the barrel 10. As a result of substantial air flow through the air cleaner, it will be appreciated that there is a substantial drop in pressure of air as it passes through the air cleaner. In other words, the pressure of air at the inlet to the bowl or venturi of the carburetor is appreciably below atmospheric pressure. Moreover, this pressure differs from atmospheric pressure by an amount which is a function of air flow through the carburetor.

The actual supply of fuel to the venturi occurs as a result of partial vacuum or sub-atmospheric pressure existing at the throat of the venturi and the pressure of air on the upper surface of the fuel in the float chamber.

Where atmospheric pressure was admitted directly to the bowl, the pressure differential effective on the main nozzle was not dependent solely on air velocity, since a

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variable and substantial pressure drop occurred across the air cleaner.

In accordance with the present invention the bowl 20 is provided with an air passage 52 extending from the upper part of the float bowl to a port 53 within the air cleaner in proximity to the air inlet from the air cleaner to the upper end of the barrel 10. As a result of this construction the air pressure acting on the fuel contained in the bowl is the same or substantially the same as the pressure of air existing at the inlet to the barrel of the carburetor. Thus, any pressure drop occurring across the air cleaner is ineffective to produce variations in the pressure differential which acts to force fuel through the nozzle 16.

However, the construction as thus far described is not satisfactory as a result of its functioning during hot soaking. If the engine has been running a substantial time and has reached relatively high temperature and is then shut off, the transfer of heat by conduction or otherwise to all parts of the engine including the carburetor, results in vaporizing or in some cases actual percolation of the liquid fuel contained in the bowl. With the construction as thus far described, the liquid fuel or its heavy vapors would be forced through the air passage 52 into the air cleaner. Since the upper end of the air passage 52 is adjacent the upper or inlet end of the carburetor barrel, these vapors would in general flow down through the venturi and unless the throttle 14 were completely closed, they would flow into the manifold. The result of this is that when an attempt is made to start the engine, the initial supply of fuel to the cylinders would be too rich and the engine would fail to fire until continued cranking exhausted the over-rich mixture.

In accordance with the present invention, a vent passage 54 is provided extending from an intermediate portion of the air passage to atmosphere. The vent passage 54 has at its lower end a port 56 opening to atmosphere. It will be observed from the figure that the port 56 is directly above the upper wall 58 of the bowl. This upper wall is provided with an upwardly open downwardly extending well or recess 60 which receives the guide stem 62 of a very light gravity biased check valve 64. When the engine to which the carburetor is attached is not running, the check valve 64 will occupy the illustrated position at which time the vent passage 54 is open to atmosphere. Accordingly, as gasoline vapors boil off from the bowl 20 to pass out the vent passage 54 to atmosphere, passage of the vapors into the interior of the air cleaner is at a minimum since the nature of air cleaners offers resistance to flow of the vapors, and such flow through the vent passage 54 to atmosphere is totally unrestricted. Moreover, it will be observed that the vent passage 54 is inclined downwardly and the troublesome vapors which lead to difficulties in restarting the engine are in general heavier than air so that they tend to flow by gravity through the downwardly inclined vent passage 54.

When however, the engine to which the carburetor is attached is started there is an immediate substantial flow of air through the carburetor barrel, drawing air from atmosphere through the air cleaner. As a result of resistance to flow through the air cleaner, the air pressure existing at the upper end of the air passage 52 is appreciably below atmospheric. This air pressure is communicated to the interior of the bowl and supplies the major pressure effective to cause fuel to flow out of the nozzle against the reduced pressure of vacuum existing at the throat of the venturi. A second effect of the reduced pressure existing at the port 53 of the air passage 52 is a pressure difference between the port 53 and the port 56 in the vent passage 54. As a result of this, air under atmospheric pressure tends to enter the vent passage 54

and to flow upwardly therethrough into the interior of the air cleaner. However, the check valve 64 is designed to move to closed position upon a minimum flow of air so that during operation of the engine, the check valve is retained by atmospheric pressure in its upper or closed position against the port 56.

The drawings and the foregoing specification constitute a description of the improved carburetor assembly in such full, clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claims.

What I claim as my invention is:

1. A carburetor for an internal combustion engine having a barrel including a venturi, a fuel bowl, a nozzle in the venturi of said barrel, a passage connecting said bowl and nozzle, an air cleaner disposed at the inlet end of said barrel, an always open air passage extending upwardly from the upper part of said bowl to a position within said air cleaner adjacent the inlet end of said barrel to subject the fuel in said bowl to an air pressure equal to atmospheric pressure less the pressure drop through said air cleaner, a vent passage connecting said air passage at a point below the top thereof to atmosphere, and a check valve in said vent passage disposed to prevent entrance of air into said air cleaner through said vent whenever the engine is running and irrespective of throttle position.

2. A carburetor as defined in claim 1 in which said check valve is gravity biased toward open position.

3. A carburetor as defined in claim 1 in which the vent passage extends downwardly from its port connecting to the air passage to its port to atmosphere.

4. A carburetor for an internal combustion engine having a barrel including a venturi, a fuel bowl, a nozzle in the venturi of said barrel, a passage connecting said bowl and nozzle, an air cleaner disposed at the inlet end of said barrel, an air passage extending upwardly from the upper part of said bowl to a position within said air cleaner adjacent the inlet end of said barrel and to a point appreciably above the bottom of the air cleaner to subject the fuel in said bowl to an air pressure equal to atmospheric pressure less a pressure drop substantially equal to that through said air cleaner, a vent passage connecting said air passage at a point below the top thereof to atmosphere, said vent passage extending downwardly from its point of connection to the air passage to its port to atmosphere, the port of said vent passage connecting to atmosphere being located at the bottom of said air cleaner, and a check valve in said vent passage disposed to prevent entrance of air into said air cleaner through said vent when the engine is running.

5. A carburetor for an internal combustion engine having a barrel including a venturi, a fuel bowl, a nozzle in the venturi of said barrel, a passage connecting said bowl and nozzle, an air cleaner disposed at the inlet end of said barrel, an air passage extending from the upper part

of said bowl to a position within said air cleaner adjacent the inlet end of said barrel to subject the fuel in said bowl to an air pressure equal to atmospheric pressure less the pressure drop through said air cleaner, a vent passage connecting said air passage to atmosphere, and a check valve in said vent passage disposed to prevent entrance of air into said air cleaner through said vent when the engine is running, said air cleaner being located directly over said bowl, the upper wall of said bowl having an upwardly open valve retaining recess therein, said vent passage having a port directly above said recess, said check valve having a guide portion in said recess and a valve portion movable upwardly by atmospheric pressure when pressure within said air cleaner is reduced by flow of air therethrough.

6. A carburetor for an internal combustion engine having a barrel including a venturi, a fuel bowl, a nozzle in the venturi of said barrel, a passage connecting said bowl and nozzle, an air cleaner disposed at the inlet end of said barrel, an air passage extending from the upper part of said bowl to a position within said air cleaner adjacent the inlet end of said barrel to subject the fuel in said bowl to an air pressure equal to atmospheric pressure less the pressure drop through said air cleaner, a vent passage connecting said air passage to atmosphere, and a check valve in said vent passage disposed to prevent entrance of air into said air cleaner through said vent when the engine is running, said air passage extending upwardly at the side of said carburetor barrel to a point substantially above the inlet end of said carburetor but substantially removed from the area of air admission into said air cleaner, and said vent passage extending from adjacent the upper end of said air passage to an atmosphere port located at the bottom of said air cleaner.

7. A carburetor for an internal combustion engine having a barrel including a venturi, a fuel bowl, a nozzle in the venturi of said barrel, a passage connecting said bowl and nozzle, an air cleaner disposed at the inlet end of said barrel, an air passage extending from the upper part of said bowl to a position within said air cleaner adjacent the inlet end of said barrel to subject the fuel in said bowl to an air pressure equal to atmospheric pressure less the pressure drop through said air cleaner, a vent passage connecting said air passage to atmosphere, and a check valve in said vent passage disposed to prevent entrance of air into said air cleaner through said vent when the engine is running, the atmosphere port of said vent passage being located directly above the top wall of said bowl, and said check valve being partly disposed in a locating recess provided in said top wall.

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