

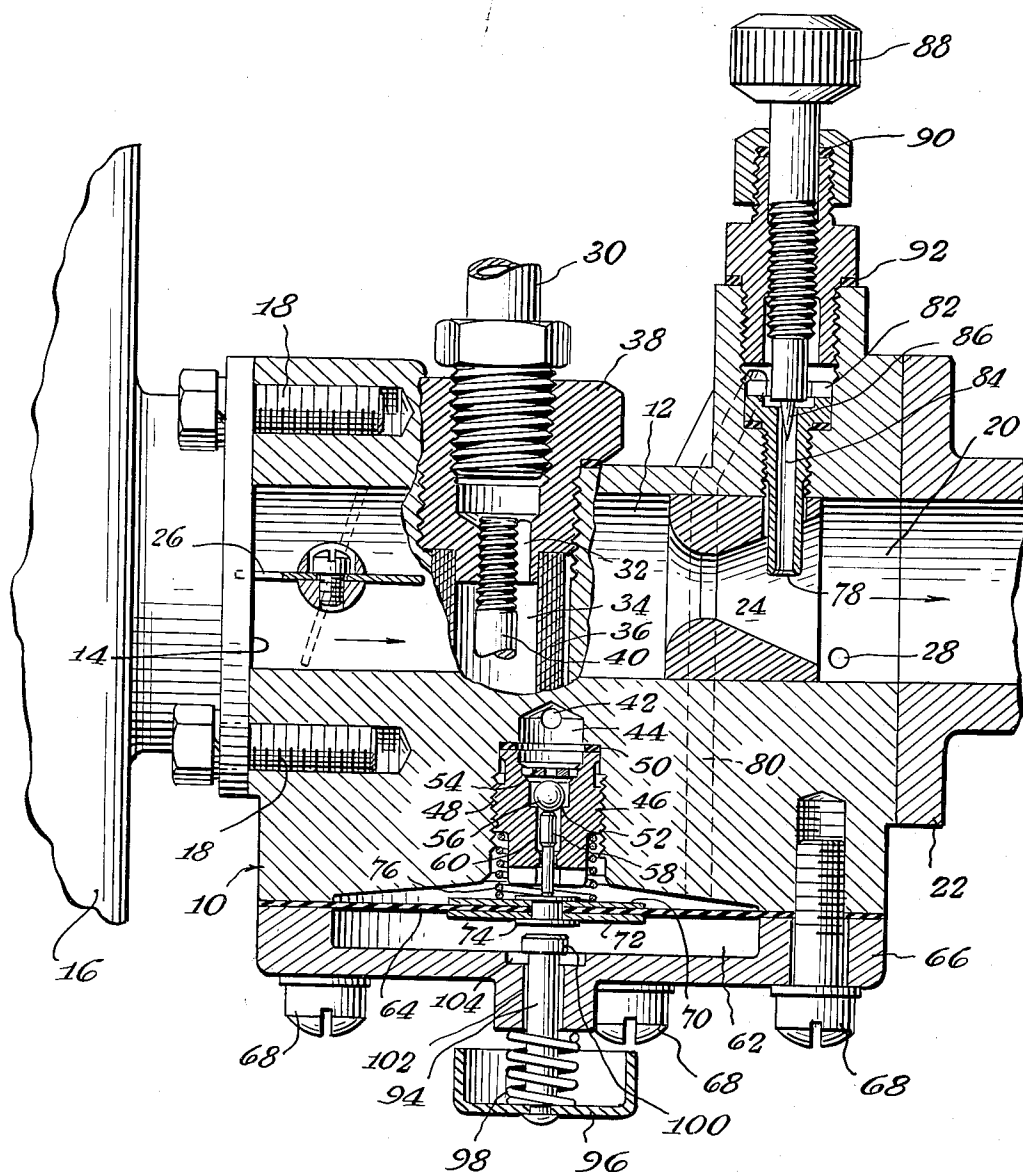
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R. F. BRACKE

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CARBURETOR

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Inventor
Robert F. Bracke
By
Mann, Brown & Hannemann
Attorneys

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2,728,564

CARBURETOR

Robert F. Bracke, Arlington Heights, Ill., assignor, by mesne assignments, to Mall Tool Company, a corporation of Illinois

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2 Claims. (Cl. 261—69)

My invention relates to carburetors and is more particularly directed but not limited to a carburetor for an engine having a constant power demand such as the free piston engine of a gasoline power operated hammer.

An object of my invention is to provide a simple, efficient, and inexpensive carburetor which will automatically and effectively compensate for differences in head of fuel in a supply tank to which the carburetor is connected.

Another object of my invention is to provide a carburetor having a new and improved fuel valve.

Another object of my invention is to provide a carburetor having new and improved fuel control means.

Other objects and advantages will become apparent as the description proceeds.

The single figure of the drawing is a general vertical, sectional, elevational view of a preferred embodiment of my invention.

Referring to the drawing it will be seen that my invention comprises a body 10 having an air passage 12 therethrough. This air passage has an inlet end 14 which may be provided with an air cleaner 16 if desired, such air cleaner being attached to the body 10 by means of bolts 18. The outlet end 20 of the air passage 12 is in communication with an intake manifold 22 or directly with the intake port of an engine to which the carburetor is attached by suitable bolts or in any other desired manner.

A Venturi 24 is located in the air passage 12 and a choke valve 26 is provided adjacent the inlet end of this air passage. It will be understood that this choke valve 26 may be provided with any usual controls for adjusting the choke between the full line position and dotted line position and all intermediate points. The air passage 12 is also provided with a drain opening 28 which serves to prevent flooding. Since the carburetor is designed for use with an engine having a constant power demand, no throttle valve is provided.

Fuel is supplied to the carburetor through a pipe 30 connected with a fuel tank or any other suitable source of supply. The incoming fuel flows through a passage 32 into the central portion of a filter chamber 34 containing a cylindrical filter 36 clamped to the inlet fitting 38 by a bolt 40. By removing inlet fitting 38 the filter 36 may be readily inspected and replaced if desired.

Fuel which is passed through the filter 36 flows through a passageway 42 to the upper end of a valve chamber 44 partly defined by the body 10 and partly by a valve seat member 46 threadedly secured to the body 10 as indicated at 48. A gasket 50 is preferably clamped between the upper end of the member 46 and an adjacent shoulder provided by the body 10 to effect a fluid-tight seal therebetween. The member 46 provides a valve seat 52 and a perforated valve retainer 54 spaced from the seat 52. A ball valve 56 is located between the seat 52 and retainer 54 and normally engages the seat 52 when the engine is not running to prevent flow of fuel therepast. It will be noted that the ball valve 56

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is not acted upon by any spring or other restricting member and is free to rotate as fuel flows therepast. Such rotation causes the valve to wipe itself and its seat free of any dirt deposited thereon and is important in maintaining the valve in perfect operating condition at all times.

The ball valve 56 is moved away from its seat 52 by a push rod 58 fitting loosely in a passageway 60 in the lower end of the valve member 46. This passageway 60 provides communication between the valve chamber and the upper portion of a diaphragm chamber 62. A diaphragm 64 divides the chamber 62 into upper and lower portions and is clamped between the body 10 and a cover 66 secured to the body by screws 68.

The diaphragm 64 is made of material which is impervious to gasoline and water and which is capable of flexing in response to differentials in pressures on opposite sides thereof. The central portion of the diaphragm 64 is provided with metal plates 70 and 72 clamped to opposite sides of the diaphragm by a rivet 74. This rivet engages the lower end of push rod 58 and transmits valve opening force thereto when the diaphragm flexes upwardly. A spring 76 confined between diaphragm plate 70 and a shoulder provided by valve seat member 46 urges the central portion of the diaphragm downwardly.

My novel carburetor is provided with a single jet 78 located in the Venturi 24. Fuel from the upper portion of the diaphragm chamber is drawn upwardly through passageway 80 to a needle valve chamber 82 and thence flows through passageway 84 to the discharge jet 78. A needle valve 86 controls communication between chamber 82 and passageway 84 and can be adjusted to regulate the flow of fuel by turning knob 88. Sealing glands 90 and 92 prevent leakage of air into the needle valve chamber 82 and friction between the needle valve and its cooperating parts retain the valve in adjusted position.

I have provided what is commonly known as a tickler mechanism for manually opening the fuel valve 56. This tickler mechanism comprises a rod 94 having a cap 96 secured to its lower end. A spring 98 confined between this cap and a part of the cover 66 holds the rod 94 in the retracted position shown. In this position the enlarged upper end 100 serves to limit withdrawal of the rod and is spaced below the rivet 74 of the diaphragm 64. By pushing upwardly on the cap 96 the central portion of the diaphragm and push rod 58 are moved upwardly to open the fuel valve 56.

This tickler mechanism also provides communication between the lower side of the diaphragm 64 and atmosphere. The push rod 94 fits loosely in bore 102 of cover 66. The space around the rod 94 and the transverse slot 104 provide such communication so that the lower side of the diaphragm is always exposed to atmospheric pressure.

In starting an engine provided with my novel carburetor the choke valve 26 would normally be moved to substantially closed position and the mixture delivered to the engine could be further enriched by pressing upwardly on the tickler cap 96 to manually open the fuel valve 56. The engine is then cranked or otherwise turned over and this creates a flow of air through the air passage 12 and also a suction at the jet 78, thereby producing a flow of fuel to this jet and a discharge of this fuel into the air flowing to the engine intake. As soon as the engine has started, the tickler cap 96 would normally be released and the fuel valve held open solely by the suction created on the upper side of the diaphragm 64 by engine operation, such suction being transmitted to the upper side of the diaphragm through jet 78, passageway 84, needle valve chamber 82, and passageway

80. As soon as the engine warms up, the choke valve 26 is returned to fully open position.

Since the engine is of the constant demand type, it will be readily apparent that the suction created above the diaphragm 64 would be constant if the pressure under which the fuel is supplied to valve chamber 44 remains constant. However, this latter pressure varies with the head of fuel in the fuel tank and the function of the diaphragm 64 is to so regulate the fuel valve 56 that a uniform quantity of fuel is supplied to the engine regardless of variations in the amount of fuel in the fuel tank.

From the foregoing it will be apparent that I have provided a very simple, efficient, and durable carburetor for engines of the constant demand type and that this carburetor can be manufactured inexpensively. The only parts requiring precision manufacture are the ball 56 and its seat 52. Steel balls manufactured to extremely close tolerances are readily available on the open market and it is a simple matter to make the valve seat 52 accurate. The other parts may all be readily manufactured to conventional tolerances by high speed production equipment and methods, and readily assembled to produce the completed carburetor.

While I have illustrated and described only a single embodiment of my invention, it is to be understood that my invention may assume other forms and that my invention includes all variations, modifications, and equivalents coming within the scope of the appended claims.

I claim:

1. A carburetor comprising a body having an air passage therethrough, a Venturi in said passage, a fuel jet discharging into said Venturi, means providing a fuel inlet for said carburetor, passageways including a diaphragm chamber and a valve chamber above said diaphragm chamber connecting said fuel inlet with said fuel jet, a restricted vertical passageway connecting said diaphragm and valve chambers, a valve in said valve chamber including a free ball resting on a seat formed at the mouth of said restricted vertical passageway, said ball being held on said seat by gravity, a diaphragm horizontally disposed in said diaphragm chamber having its under side exposed to atmosphere, and a movable rod supported on said diaphragm to be actuated thereby and extending through said vertical passageway and loosely fitting therein, said movable rod extending to said ball valve connecting said diaphragm and said ball valve, whereby when said diaphragm is displaced said movable rod unseats said ball valve allowing fuel to pass

through said valve chamber, the restricted vertical passageway around said movable rod, and said diaphragm chamber to said fuel jet, and when said diaphragm returns to its original position gravity reseats said ball valve preventing the flow of fuel to the fuel jet.

2. A carburetor comprising a body having an air passage therethrough, a Venturi in said passage, a single fuel jet discharging into said Venturi, means providing a fuel inlet for said carburetor, a diaphragm chamber, passageways including a valve chamber disposed above said diaphragm chamber connecting said fuel inlet with said diaphragm chamber, a restricted vertical passageway connecting said diaphragm and valve chambers, a fuel valve in said valve chamber including a free ball resting on a seat formed at the mouth of said restricted vertical passageway, said valve being gravity actuated to seal the mouth of said passageway, a diaphragm in said diaphragm chamber having one side exposed to fuel therein and the other side exposed to atmosphere through a bore in said body, a movable rod supported on said diaphragm connecting said diaphragm and said fuel valve, said movable rod extending through said restricted vertical passageway and loosely fitting therein, and a passageway extending from said diaphragm chamber to said fuel jet to displace said diaphragm in accordance with the pressure in said Venturi, whereby when said diaphragm is displaced said movable rod unseats said fuel valve allowing fuel to flow from said fuel inlet through said fuel valve and said restricted vertical passageway around the movable rod therein to said diaphragm chamber and to the fuel jet, and when said diaphragm returns to its original position gravity reseats said valve sealing the mouth of said restricted vertical passageway and preventing the flow of fuel to the diaphragm chamber and the fuel jet.

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