Dec. 26, 1967 L. C. PARKER 3,360,003

CARBURETOR FLOAT VALVE

Filed May 14, 1965

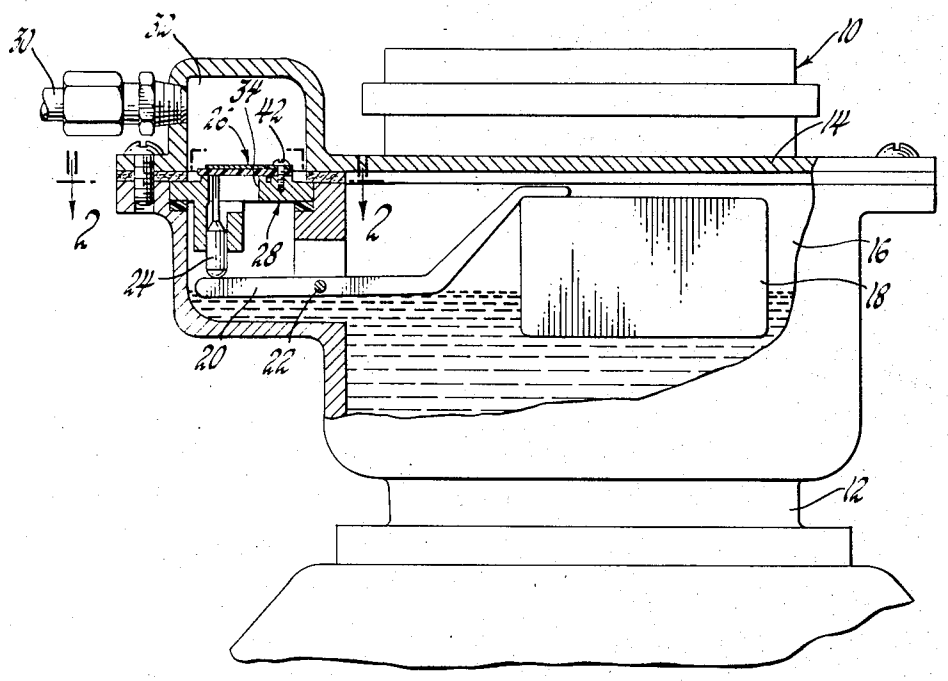


Fig. 1

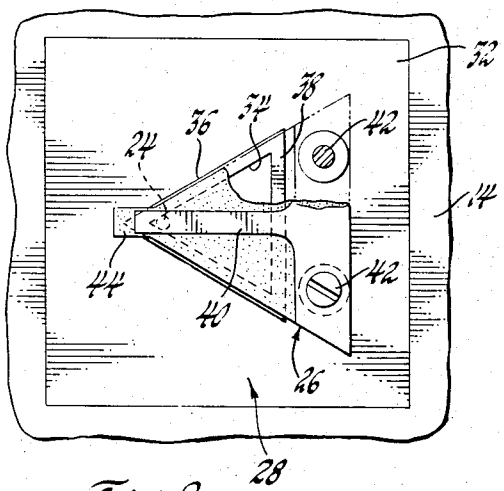


Fig. 2

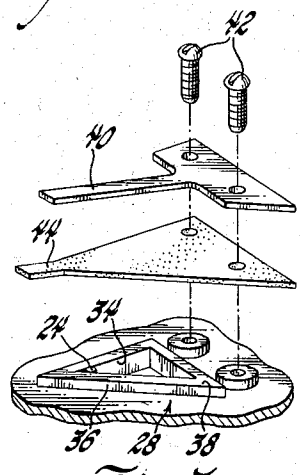


Fig. 3

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CARBURETOR FLOAT VALVE

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ABSTRACT OF THE DISCLOSURE

A triangular valve member operated by a fuel level responsive float flexes against incoming fuel pressure and the force of a biasing spring to provide increasing areas for fuel flow.

This invention relates to carburetors and more particularly to a flexible float valve for a carburetor fuel bowl.

The flow of fuel into the fuel bowl of a carburetor is normally controlled by a valve which is operated by a float located within the fuel bowl. The float is adjusted to close the valve when the fuel in the bowl reaches the desired level and to open the valve when the fuel drops below this level. When the valve is arranged to be biased closed by the pressure of the incoming fuel, the force produced by the weight of the float and increased by suitable linkage must be sufficient to open the valve against this pressure.

Present day automotive engines require carburetors which will supply an air fuel mixture at a high rate of flow. This requirement can be met by increasing the size of the fuel bowl and the size of the valve which admits fuel to the bowl. However, in some applications, space limitations or other factors limit the increase in size of the fuel bowl to less than required.

Limitations on the size of the fuel bowl also limit the size of the float and linkages which may be used to operate the valve. In some cases the force exerted by the float may be insufficient to open the large area valve needed to satisfy the fuel requirements of the carburetor.

The present invention overcomes this difficulty by providing a flexible float valve member which may be opened by a very small opening force applied by the float and linkage since only a portion of the valve member need be opened to admit fuel.

When a rigid valve member is made large enough to supply the fuel requirements, initial movement of the valve to open position often permits excess fuel to flow to the fuel bowl before the regulating valve is closed. This difficulty is also overcome since the entire valve member of this invention need not be opened to admit fuel to the fuel bowl but only a portion thereof need be opened to permit a small amount of fuel to flow into the fuel bowl and thus accurately control the level of the fuel.

One feature of this invention is that it provides an improved float valve for controlling the flow of fuel to the fuel bowl of a carburetor.

Another feature of this invention is that it provides a float valve for a carburetor which may be opened by a small opening force and yet permit a high rate of fuel flow.

A further feature of this invention is that it provides a flexible float valve member for a carburetor having gradually increasing areas thereof movable away from gradually increasing areas of a valve seat opening to provide accurately controlled gradually increasing rates of flow.

Yet another feature of this invention is to provide a flexible carburetor fuel bowl inlet valve member having a small portion which will easily bend away from the valve seat opening upon application of a small amount of pressure thereto and permit a low rate of fuel flow to the fuel bowl.

These and other features of this invention will be apparent from the following specification and drawings wherein:

FIGURE 1 is a partly broken away elevational view of a carburetor embodying a valve according to this invention;

FIGURE 2 is an enlarged view taken generally along the plane indicated by line 2—2 of FIGURE 1 with parts broken away to show the valve seat; and

FIGURE 3 is an exploded view illustrating the components of the valve arrangement.

A carburetor designated generally **10** includes a body **12** and cover **14**. A fuel bowl **16** is formed by a portion of the body and cover and contains a float **18**. The float is secured to one end of an arm **20** which is pivotally mounted on body **12** by pin **22**. The other end of the arm engages one end of a plunger **24**, the other end of which is adapted to exert an opening pressure on a flexible valve member designated generally **26** which is part of the carburetor float valve designated generally **28**. Pressurized fuel supplied by a fuel pump, not shown, flows through the fuel line **30** to the fuel inlet chamber **32**. The fuel in the fuel inlet chamber exerts a closing pressure on the valve member **26** and thus increases the pressure needed to open the valve member. As the fuel level in the fuel bowl drops, the float also drops pivoting the arm **20** about the pin **22** and exerting an upward pressure on the valve member **26** through the plunger **24**. When the valve opens in response to pressure of the plunger, fuel flows to the fuel bowl to restore the fuel to its original level and raise the float to its original position so that valve **28** may be closed as will be described later.

The float valve **28** includes the flexible valve member **26** which is generally triangularly shaped and generally complementary in shape to a valve opening **34** which is defined or bounded by a raised wall **36**, the upper surface of which provides a valve seat **38**. A generally T-shaped spring **40** has the head thereof overlying a base portion of the valve member **26**, with the spring and valve member being secured at **42** adjacent a base wall portion of the wall **36**. The shank of the spring **40** biases the valve member **26** to a closed position in engagement with the seat **38**. It will be noted that the valve mmeber **26** has the sides thereof spaced slightly inwardly of the side wall portions of wall **36** and the apex thereof provided with a small generally rectangularly shaped tab or portion **44** which overlies the apex of the side wall portions of wall **36**. The shank of the spring **40** engages only a portion of the tab **44**. The plunger **24** engages the valve member **26** immediately adjacent the tab **44** thereof.

When the fuel level in the fuel bowl drops, the plunger **24** will bend back the tab **44** and an adjacent small area portion of the valve member **26** to thereby permit fuel to flow into the bowl. If the fuel level is only slightly below the desired level, a small amount of fuel will restore the fuel to the desired level. Only a small portion of the valve member **26** need be opened to admit this small amount of fuel and restore the desired level without overfilling the bowl. Since the force exerted by the float **18** depends on the fuel level in the bowl, it can be seen that where only a slight amount of fuel is needed to fill the bowl to the desired level, the arm **20** will exert only a slight force and since only a small area portion of the valve portion **26** need be opened this force is sufficient. Further, since only a small area portion of the valve member **26** is opened, the flow of fuel into the bowl can be accurately controlled.

The shape of the valve member **26** and the opening **34** provide gradually increasing areas to in turn provide

gradually increasing rates of flow to the fuel bowl. Thus, depending on the level of the fuel in the bowl and the relationship of this level to the desired level, the valve member **26** and opening **34** can be opened with respect to each other to provide the desired rate of flow necessary to return the level of the fuel in the bowl to that desired.

It is desirable that the valve member and opening be formed in a triangular shape or other shapes which have gradually increasing areas. This permits the plunger to be located so that it contacts a small area portion of the valve member to open a complementary small area portion of the opening. It is also desirable that the plunger **24** be located so that it will contact the valve member **26** remote from the secured portion thereof. This permits a small area portion of the valve to be opened and results in better regulation of the liquid level in the fuel bowl.

Thus an improved carburetor float valve has been provided.

What is claimed is:

An internal combustion engine carburetor having a body defining a fuel bowl chamber, a fuel inlet chamber and an inlet port opening from said inlet chamber to said bowl chamber, a raised wall extending circumferentially about said port on the inlet chamber side thereof to form a valve seat having a generally triangular shape, a flexible valve member overlying said raised wall, said valve member having a shape which generally conforms to the shape of said valve seat and which coacts with said valve seat to control fuel flowing from said inlet chamber to said fuel bowl chamber, means securing a base portion of said valve member to said body adjacent a base portion of said valve seat, said valve member having an apex portion opposite said base portion and including a tab portion extending outwardly from said apex portion away from said base portion, a leaf spring member overlying said valve member and secured at one end adjacent the base portion of said valve seat and extending over said tab portion of said valve member, fuel level responsive float means disposed in said bowl chamber, a pivotal arm secured at one end to said float means, and a reciprocable plunger operated by said arm for opening said valve member in response to a decrease in fuel level in said bowl chamber, said plunger bearing only against and exerting a force on the apex portion of said valve member for flexing said valve member against the pressure of fuel in said inlet chamber and against the force of said spring member whereby only a small portion of said valve member may be unseated initially to permit fuel to flow at a low rate into said fuel bowl chamber and whereby increasing portions of said valve member may be unseated subsequently to permit fuel to flow from said inlet chamber to said fuel bowl chamber at higher rates of flow.

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