

Aug. 4, 1953

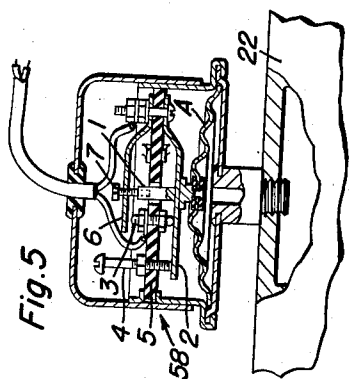
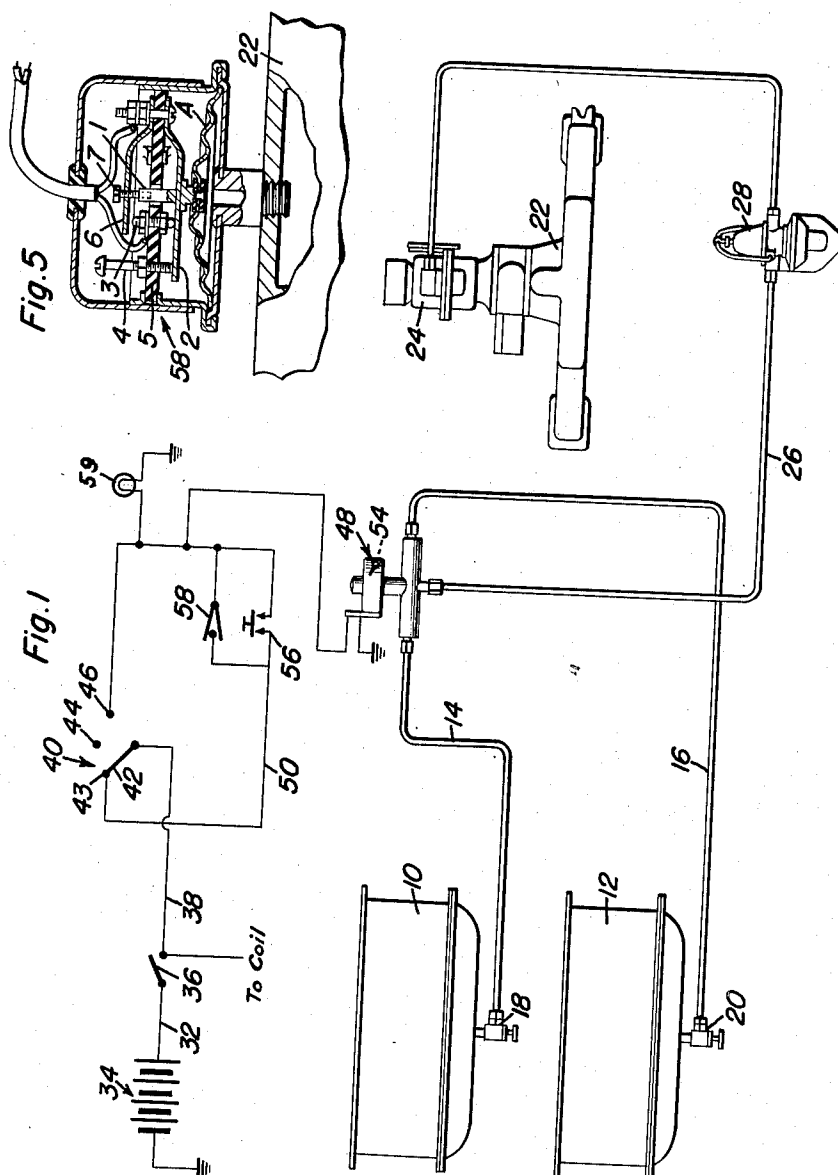
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2,647,735

ATTACHMENT FOR CARBURETORS

Filed Nov. 21, 1950

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

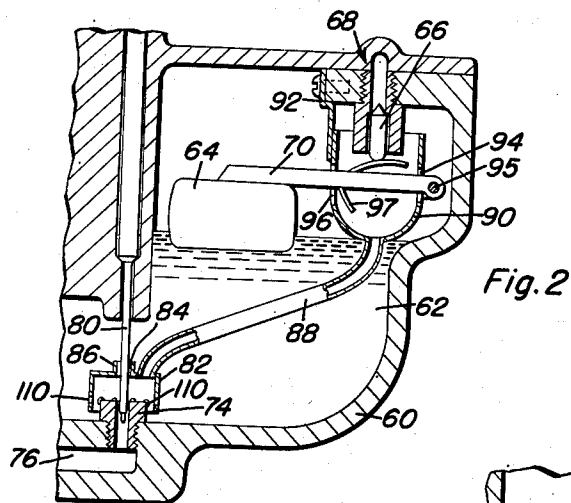


Fig. 2

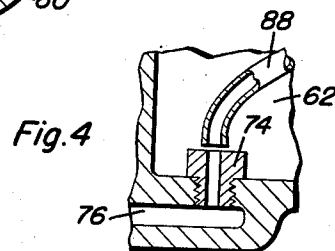


Fig.4

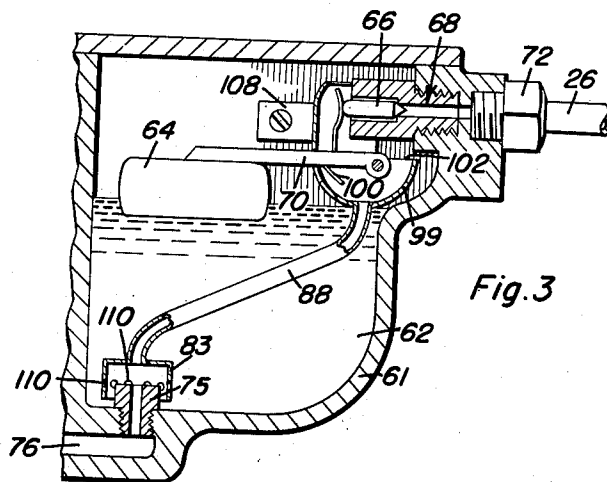


Fig.3

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2,647,735

ATTACHMENT FOR CARBURETORS

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Application November 21, 1950, Serial No. 196,829

6 Claims. (Cl. 261-72)

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The present invention relates to a carburetor attachment and contains subject matter similar to that disclosed in my copending application, Serial No. 196,830, filed on November 21, 1950.

An object of this invention is to provide an improved carburetor by virtue of an attachment to it which is located in the bowl thereof in order to conduct fuel substantially directly from the float-operated valve to the bowl outlet jet, whether it be controlled by a metering rod or not, whereby when using a multi-fuel supply system, the lag of engine performance, when switching from one fuel to the other caused by the necessity of using all of the fuel from the bowl of the carburetor before the new fuel enters the jet, is almost completely obviated.

Other objects and features of importance will become apparent in following the description of the illustrated form of the invention.

In the drawings:

Figure 1 is a diagrammatic view showing one multi-fuel system for an internal combustion engine wherein the improved carburetor and its attachment is used;

Figure 2 is an enlarged fragmentary sectional view of a part of a carburetor showing the attachment applied;

Figure 3 is an enlarged fragmentary sectional view showing the attachment applied to another type of carburetor;

Figure 4 is a fragmentary sectional view showing a slight modification of the attachment; and

Figure 5 is a sectional view of a suction-operated switch used in the invention.

Attention is first invited to Figure 1. There is a fuel tank 10 which is adapted to contain one type or grade of fuel. The fuel tank 12 is adapted to contain a second grade or type of fuel. Conduits 14 and 16 extend from outlets of the tanks 10 and 12 and standard valves 18 and 20 are interposed in the conduits 14 and 16 for manual control of the fuel flowing from the tanks.

A standard intake manifold 22 is illustrated in this figure and has a carburetor 24 located thereon. A pipe 26 having the fuel pump 28 interposed therein is connected to the inlet of the carburetor.

The wiring appurtenant to the assembly includes an electrical conductor 32 extending from the source 34 and having the standard ignition switch 36 therein. A wire 38 extends from the standard ignition switch and connects to the selector switch 40. This selector switch has a switch arm 42 arranged to engage the contacts 43, 44 and 46, respectively. When the switch

arm engages the contact 43 selectivity of operation of the selector valve assembly 48 is obtained, inasmuch as the wire 50 extends from the contact 43 and is attached to a contact of the electric motor 54, forming a part of the selector valve assembly. The preferable type of motor is a solenoid. Interposed in the wire 50 is a switch 56 which is adapted to be actuated by the choke and idle linkage of the carburetor, this switch being appropriately located. A suction responsive switch 58 is operatively connected to the intake manifold 22 so that suction beyond a predetermined value causes the switch to operate. Therefore, the switch 56 may be so arranged that at idling speeds or while choking, the switch is closed, thereby causing operation of the selective valve 48 and permitting only the better grade of fuel to flow to the carburetor. The same is true at idling speeds when the suction in the intake manifold is high. The switch 58 will remain closed, causing only the better grade fuel to flow into the carburetor. At this time, the signal lamp 59, appropriately wired in the circuit, is illuminated.

As disclosed in Figure 7, there is a switch 58 operatively connected with the intake manifold 22 of the engine whereby suction of the manifold is caused to actuate the diaphragm A of the switch. The construction is such that the switch 58 will remain closed, causing only the better grade of fuel to flow into the carburetor at idling speeds when the suction in the intake manifold is high, and will open when the suction decreases to allow a lower grade of fuel to be used, but will close again at such time that the suction is even lower.

At low vacuum, the diaphragm A will expand, allowing the center stem 1 to force the lower contact finger 2 to engage the bottom end of the terminal 3. The adjustment screw 4 carried by the insulating partition 5 is used to set the lower contact finger to make contact at the desired point of low vacuum. A spring may be used in conjunction with the diaphragm if found necessary in order to insure that the diaphragm will expand properly.

The diaphragm contracts as the vacuum increases in the intake manifold 22 due to the fitting connecting the intake manifold with the switch casing. This draws the center stem 1 down, thereby pulling the upper contact finger 6 down to engage the upper end of the terminal 3 when the vacuum increases to a desired point. The adjustment screw 7 connecting the center post and the upper contact 6 is used to adjust

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the upper contact finger to make contact at the desired point of high vacuum.

The electrical circuit illustrated in Figure 1 is thereby controlled.

The contact fingers 2 and 6 normally will not touch the terminal 3 due to the tension of the fingers unless actuated by the diaphragm A through the center stem 1. Thus, through the range between high and low vacuum the switch would be open. The switch would be closed at high and low vacuum.

When the switch arm 42 is moved to the contact 44, the circuit is open. When the switch arm 42 is moved to engage the contact 46, due to the wiring the switches 56 and 58 are bypassed. Hence, the selective valve motor 54 will be energized holding the selective valve assembly 48 in such condition that the better grade of fuel only will flow to the carburetor.

In operational summation, when the arm 42 is engaged with the contact 43, there is "automatic" selective valve 48 control. When the switch arm 42 is moved off the contact 43 but prior to engagement with the contact 46, the selector valve assembly 48 is inoperative. When the switch arm 42 engages the contact 46, premium fuel flows through the valve assembly 48.

As disclosed, one fuel pump 28 is required. The multi-fuel pump system as disclosed in Patent No. 2,163,241 may be used as an alternative. In that patent, there is a single fuel pump for one tank and the other tank has an individual fuel pump.

Attention is now invited to Figures 2-4, inclusive. The carburetor bowl 60 is provided with the usual fuel chamber 62 in which a float 64 is located, this float being arranged to control the standard needle valve 66 of the needle valve assembly 68. The needle valve assembly is purely conventional and its operation by the float beam 70 is well known in the art.

A coupling 72 is employed to hold the fuel inlet pipe 26 in communication with the chamber 62, all of these elements being absolutely conventional.

Also conventional is the metering jet 74 located in an aperture in the bowl 60 to deliver fuel from the chamber 62 into the passage 76, this passage opening into other passages which ultimately lead to the intake manifold 22 of the engine.

When using a multi-fuel system, the fuel delivered through the pipe 26 enters the chamber 62 through the needle valve assembly 68. However, the fuel is drawn from the chamber 62 near the bottom thereof. Accordingly, when a relatively low grade of fuel has been used, the high grade of fuel introduced into the bowl 62 of the carburetor would not be used until substantially all of the fuel in the chamber 62 has been exhausted. More accurately, the higher grade fuel would, after a short while, mix with the remainder of the low grade fuel in the bowl. During this transition period of one fuel to the other, the better performance desired by the operator of the vehicle, whether it is an automobile, truck, tractor or the like, cannot be obtained. This is of greater importance when starting an engine after having used it previously with a lower grade fuel. Then, the entire system, or at least the system from the fuel pump 28 to the intake manifold, is filled with a low grade fuel.

Therefore, the attachment forming a major part of the present invention comprises a means for conducting fuel almost, but not quite, direct-

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ly to the metering valve 74 from the needle valve 68. The applicant states that the new fuel is only "almost" delivered directly to the metering jet 74, inasmuch as there will be some mixture of the lower grade fuel in the chamber 62 with the higher grade. This amount of mixture is very slight and, therefore, the fuel in the bowl 62 will be changed from a lower grade to a higher grade, or vice versa, rather slowly, the change taking place as would be the case in the absence of the attachment, but at a far reduced rate of speed.

In Figure 2, the metering jet 74 is the type which is controlled by a metering rod 80. This is one type of standard carburetor, now on the market. There is a hood 82 which opens downwardly and which is located directly above the upper part of the jet 74. This hood is preferably made of light-weight sheet material with a cylindrical side wall and an end plate secured to it. In the instance of Figure 2, the end plate is provided with an aperture 84 through which the metering rod 80 passes, and there is a guard 86 located around this aperture.

Means forming a passage for conducting fuel from the needle valve 68 to the hood is provided. The preferable means consists of a conduit 88 which is attached at one end to the hood 82 and which opens into this hood. The other end is attached in communication with an opening in the bottom of a trap 90. This trap is an open-topped housing arranged in communication with the path of travel of the fuel entering the bowl 60 through the valve 66. Any suitable means may be used for holding the trap 90 located in the proper position as disclosed in Figure 2. The means illustrated is a simple bracket 92 which is held fixed to a part of the structure of the carburetor inside of the bowl by means of a screw and which is soldered or otherwise rigidly fixed to a part of the trap 90.

The trap 90 is provided with aligned openings 94 and 96 through which the float beam 70 passes. In this way, the float beam, being mounted at one end of its pivot 95, is free to operate just as if the attachment were not present.

A deflector 97 is secured to the float beam and is of extremely light-weight material. The purpose of the deflector is to close partially the opening 96 so that as much of the fuel entering the chamber 62 as possible is collected by the trap 90 for substantially direct discharge in the vicinity of the metering jet 74.

Attention is now invited to Figure 3. Here, the standard carburetor is of a slightly different type. However, most of the essential elements of the attachment are identical to those described previously. The trap 99 is provided with the deflector 100 and is notched, as at 102, in order to fit in the already-present space near the top of the bowl 61. The mounting bracket 108 is connected to the trap 99 at one end and connected to the structure of the bowl 61 at the other end.

The conduit 88 is identical in each instance, while the hood 83 differs from the hood 82 in that the conduit opens into it centrally of the end wall thereof, and there is no aperture provided for a metering rod inasmuch as this type of carburetor has a metering rod located elsewhere in the structure.

The hood 82 and the hood 83 are provided with apertures 110 in the side walls thereof to allow a proper amount of circulation in the region or vicinity of the metering jets 75 and

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74, respectively, and so that the transition of one fuel in the chamber 62 to the other may take place.

Attention is now invited to Figure 4, the purpose of this view being to show that the conduit 88 may be used if placed close enough to the inlet of the metering jet 74 without the assistance of the hood 83 or the hood 82. This figure merely shows that among other modifications, a sub-combination omitting the hood 82 or the hood 83 may be arrived at.

Having described the invention, what is claimed as new is:

1. In an engine multi-fuel supply system which has a single pipe for conducting at different times more than one variety of fuel, the improvement comprising a carburetor having a bowl with a float valve located therein and a jet to conduct fuel from the bowl, a coupling connecting said pipe with said float valve, and means forming a passage to conduct fuel directly from the float valve to the vicinity of said jet, said means including a trap located in the path of fuel flow from said pipe, a conduit secured to said trap and having a discharge end terminating adjacent the jet.

2. The combination of claim 1 and the discharge end of said conduit having a hood operatively connected therewith and opening over said jet.

3. A carburetor for use with an engine employing a multi-fuel supply system, said carburetor including a single bowl compartment, a fuel inlet control valve, a trap located in said carburetor bowl compartment and arranged to first receive

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fuel delivered into the bowl of the carburetor through said valve, said carburetor having a metering jet, and means for conducting fuel from said trap and delivering it in the region of and to said jet, said means including a conduit which has one end opening into said trap and which has the other end located with its discharge part in communication with the jet.

4. The combination of claim 3 and said other end of said conduit being spaced slightly from said jet and having an apertured hood connected thereto.

5. The combination of claim 3 and said apertured hood having a side wall which extends below the upper edge of said jet.

6. In an engine multi-fuel supply system having a single fuel line for conducting at different times more than one variety of fuel, the improvement comprising a carburetor having a bowl with a float valve therein, and a jet to conduct fuel from the bowl, a coupling connecting the fuel line to the float valve to control the ingress of fuel to the bowl, and means forming a passage to conduct fuel directly from the float valve to the vicinity of the jet.

EARL L. HAYNIE.

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