Oct. 25, 1960 P. F. JETTINGHOFF 2,957,759

GASEOUS FUEL CARBURETOR

Filed Jan. 17, 1957

2 Sheets-Sheet 1

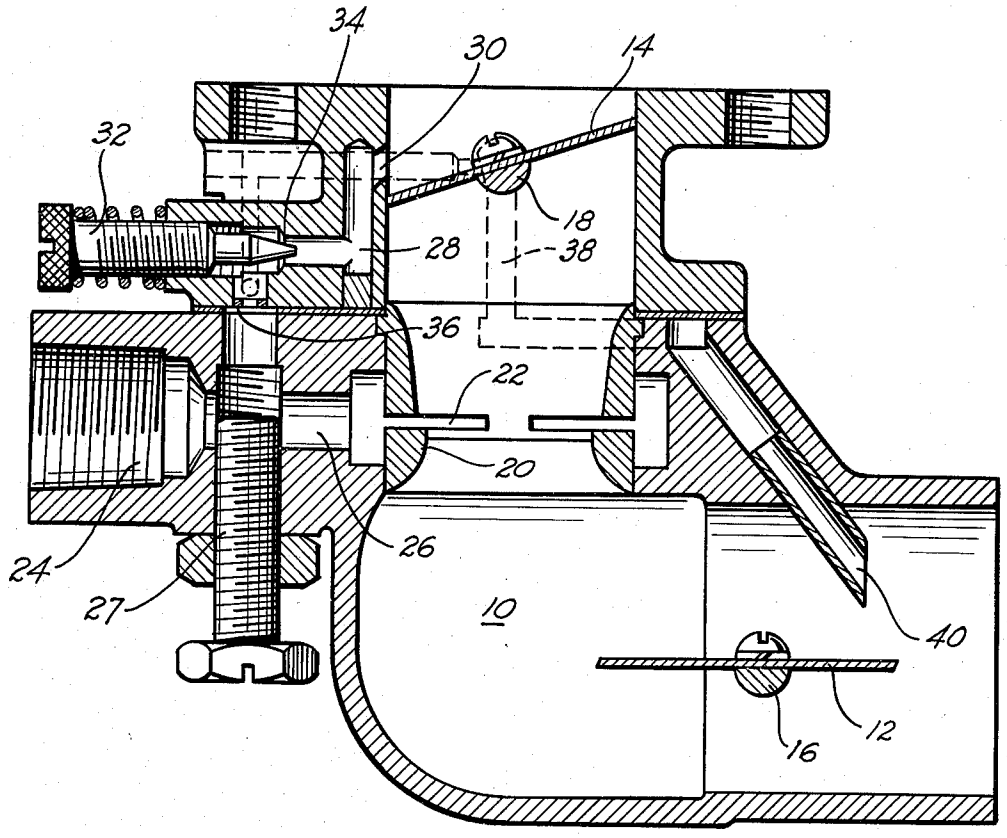

Fig. 1.

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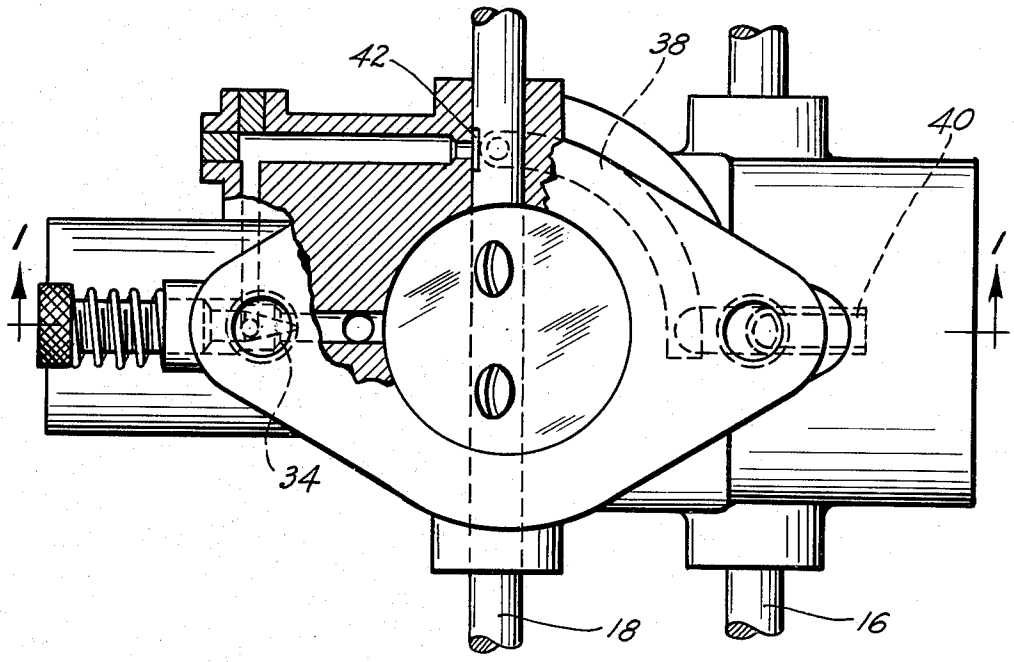

Fig. 2.

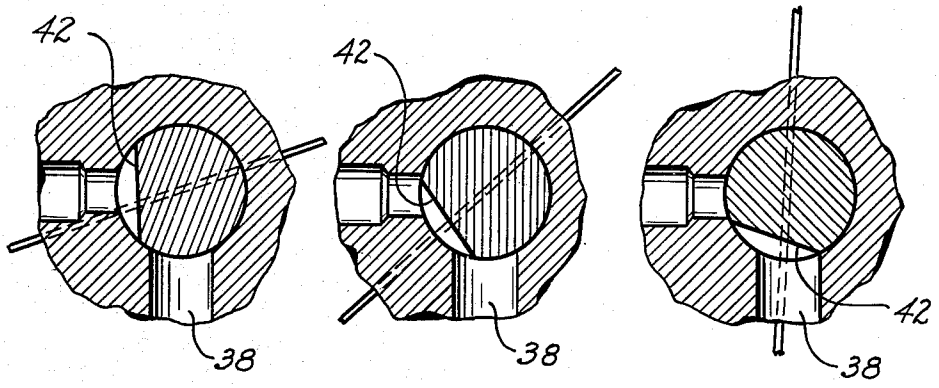

Fig. 3. Fig. 4. Fig. 5.

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GASEOUS FUEL CARBURETOR

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8 Claims. (Cl. 48—180)

The present invention relates to a control for the idle system of a liquified petroleum carburetor.

In a gasoline carburetor the idle system may be simply controlled by regulating the height of fuel in the idling well whereby a predetermined manifold vacuum will be required to pull the fuel out of the well to the idle discharge port. Not so in the liquified petroleum carburetor however, since even a very small manifold vacuum is sufficient to cause the gaseous fuel to be discharged from the idle port. Without some type of control the idle system of the liquified petroleum or LP carburetor would discharge continuously during the operation of the engine and thereby produce an excessively rich mixture during at least some conditions of engine operation.

The present invention has for an object the provision of a simplified control for a liquified petroleum carburetor whereby discharge from the idle system may be prevented as desired.

Other objects and advantages of the present invention will be readily apparent from the following detailed description taken in connection with the accompanying drawings in which:

Figure 1 is a vertical sectional view of a carburetor embodying the invention;

Figure 2 is a top view of the carburetor shown in Figure 1; and

Figures 3, 4 and 5 are fragmentary sectional views of the throttle shaft and adjacent passages showing the position of parts at different positions of the throttle valve.

Referring now to the drawings there is shown an updraft carburetor having an induction passage **10** with a choke valve **12** and a throttle valve **14** mounted respectively therein on shafts **16** and **18**. A venturi **20** is provided with an annular main discharge orifice **22** which is adapted to be connected to a source of fuel (not shown) by a conduit **24**. The flow of fuel through conduit or passageway **24** is regulated by main metering restriction **26** and a coacting valve **27**. An idle conduit **28** is connected to the main fuel conduit **24** at restriction **26** and is connected to the induction passage downstream of throttle **14** through idle port **30**. Flow through the idle conduit **28** is regulated by means of an adjustable needle valve **32** which coacts with a restriction **34**. The idle conduit is provided with a fixed restriction **36** upstream of the needle valve **32**.

An air conduit **38** is connected to the idle conduit intermediate restrictions **34** and **36** and to the induction passage anterior the choke valve by means of impact tube **40**.

As best shown in Figures 2–5 throttle shaft **18** intersects air conduit **38** and is formed with a valve **42** to control the flow therethrough. As shown in Figures 3 and 5 when the throttle valve is in closed or fully opened position the valve **42** closes conduit **38** preventing flow therethrough. As shown in Figure 4 when the throttle

is in a predetermined range of intermediate positions valve **42** is located to permit flow through passage **38**.

In operation when the engine is started and the throttle closed fuel will be discharged through the idle port **30** downstream of the throttle. As the throttle is gradually opened and a depression created at the venturi **20** fuel will be discharged both through the idle port **30** and the main discharge orifice **22**. Upon further opening of the throttle, valve **42** opens passage **38** permitting air to be bled into the idle conduit **28** thus causing flow of fuel through port **30** to cease. Restriction **36** is effective during this range of operation to substantially prevent air being bled from conduit **38** into the main fuel conduit **24**. When the throttle has reached the substantially fully opened position as shown in Figure 5, conduit **38** is again closed and fuel will again be discharged from idle port **30** to provide an enriched power mixture.

While in the preferred embodiment above described, the air conduit **38** is connected to an impact tube **40** in the induction passage upstream of the choke valve. In other installations suitable control may be provided by connecting the passage **38** with a source of air at a pressure higher than the pressure that exists at port **30**. Other modifications may be made to suit requirements.

I claim:

1. In a carburetor having a source of fuel and an induction passage with a throttle mounted therein, a shaft for said throttle, a main discharge orifice in said passage, a passageway connecting said source and said orifice, an idle port in said passage downstream of said throttle, means connecting said port to said passageway, a conduit connecting said port to said passage upstream of said throttle, and a valve formed on said shaft and disposed in said conduit to close said conduit when said throttle is in closed and fully opened positions and to open said conduit when said throttle is in a predetermined range of intermediate positions.

2. In a carburetor having a source of fuel and an induction passage with a throttle mounted therein, a main discharge means in said passage, an idle discharge means in said passage downstream of said throttle, means connecting said main and idle discharge means to said source, a conduit connecting said idle discharge means to said passage upstream of said throttle, a shaft for said throttle adapted to intersect said conduit, and a valve formed on said shaft to control the flow through said conduit, said valve being formed to close said conduit when said throttle is closed and to open said conduit when said throttle is opened a predetermined amount.

3. In a carburetor having a source of gaseous fuel and an induction passage with a venturi, a choke valve and a throttle therein, an idle port in said passage downstream of said main discharge port in said venturi, means connecting said ports with said source, a conduit connecting said idle port with said passage upstream of said choke valve, and a valve operatively connected to said throttle for controlling the flow through said conduit, said valve being formed to close said conduit when said throttle is in closed and fully opened positions and to open said conduit when said throttle is opened a predetermined amount.

4. In a carburetor having a source of gaseous fuel and an induction passage with a throttle therein, an idle discharge port in said passage downstream of said throttle, a conduit connecting said port to said passage upstream of said throttle, and a valve operatively connected to said throttle for controlling the flow through said conduit, said valve being formed to close said conduit when said throttle is closed and to open said conduit when said throttle is opened a predetermined amount.

5. In a carburetor for an internal combustion engine having a source of gaseous fuel and an induction passage with a throttle therein, an idle discharge port in said passage downstream of said throttle, an air conduit connecting said port with a source of higher pressure than exists at said port during the operation of said engine, and a valve operatively connected to said throttle for controlling the flow through said conduit, said valve being formed to close said conduit when said throttle is closed and to open said conduit when said throttle has been opened a predetermined amount.

6. In a carburetor having a source of gaseous fuel and an induction passage with a venturi and a throttle therein, a first conduit connecting said source with said venturi, a second conduit connecting said first conduit to said induction passage downstream of said throttle, a restriction in said second conduit, a passageway connecting said induction passage upstream of said venturi to said second conduit downstream of said restriction and a valve operatively connected to said throttle for controlling the flow through said passageway, said valve being formed to close said passageway when said throttle is closed and to open said passageway when said throttle is in a predetermined opened position.

7. In a carburetor having a source of gaseous fuel and an induction passage with a throttle therein, a first conduit connecting said source with said passage upstream of said throttle, a second conduit connecting said first conduit to said passage downstream of said throttle, a pair of restrictions in said second conduit, a passageway connecting said induction passage upstream of said throttle to said second conduit intermediate said restrictions and a valve in said passageway and connected to said throttle and movable therewith for controlling the flow through said passageway.

8. In a carburetor having a source of gaseous fuel and an induction passage with a choke valve and a throttle mounted therein, an idle port in said passage downstream of said throttle, means connecting said port to said source of fuel, an impact tube projecting into said passage upstream of said choke valve, a passageway connecting said tube with said port, and a valve in said passageway connected to said throttle and movable therewith for controlling the flow through said passageway.

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