July 28, 1925. 1,547,474

G. R. WELCH

CARBURETOR

Filed July 21, 1919

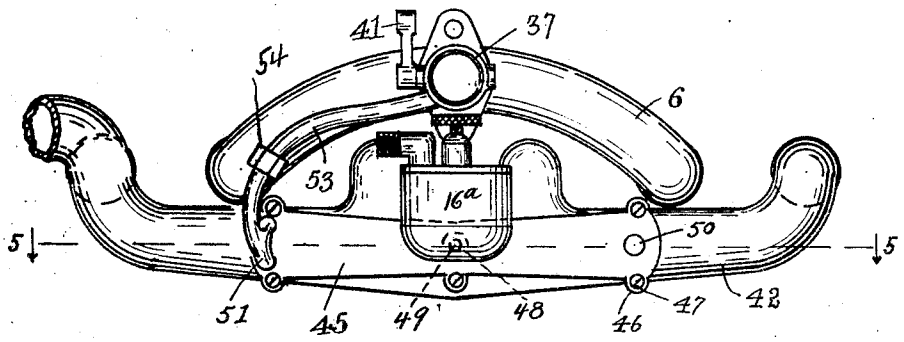


Fig. 1.

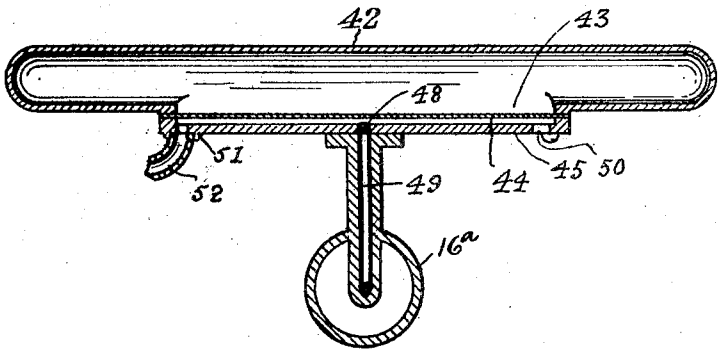


Fig. 2.

INVENTOR.
George R. Welch
BY
Dunphaine
ATTORNEY

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UNITED STATES PATENT OFFICE.

GEORGE R. WELCH, OF LOS ANGELES, CALIFORNIA.

CARBURETOR.

Application filed July 21, 1919. Serial No. 312,304.

To all whom it may concern:

Be it known that I, GEORGE R. WELCH, a citizen of the United States, residing at the city of Los Angeles, county of Los Angeles, State of California, have invented new and useful Improvements in Carburetors, of which the following is a specification.

My invention relates to a carburetor for use in an internal combustion engine in which low grade fuel may be used, and the object thereof primarily is to provide an efficient carburetor particularly intended for use with a low grade fuel although capable of highly efficient use with a high grade fuel.

In the drawings forming a part of this application,—

Figure 1 is a side elevation of my device disclosing it in use with an intake and exhaust manifold of the engine and the carburetor with which it is associated;

Fig. 2 is a section on the line 5—5 of Fig. 1.

Referring now more particularly to the drawings, 42 is the exhaust manifold of an internal combustion engine of any conventional type. In the outer portion of the casing thereof is an elongated opening or port 43 caused by eliminating or removing a portion of the manifold, which port is closed by a thin sheet metal plate 44. The plate 44 is covered by a detachable plate 45 which has lugs 46 receiving fastening screws 47 which hold the plates 44 and 45 to the manifold. As these screws are, of course, detachable, one or both of the plates can be removed at any time from the manifold for cleaning or replacement. Plate 45 is preferably tapered toward its middle or intermediate portion and has a port 48 in the center thereof into which the fuel inlet passage 49 from the carburetor float chamber 16^a opens. This plate also has flanges at the sides thereof for providing a passage between the plate and the thin plate 44. The float chamber is of any desired construction, being provided, however, with a gasoline port or passage leading to the port 48 in the plate 45. The plate 45 also has an air port 50 at one end and a boss 51 at the other end in which a pipe 52 is secured. From port 48 the passage formed between the spaced plates 44 and 45 gradually increases to provide a gradually enlarging passageway for the fuel mixture. A tube 53 is connected by a coupling 54 to the pipe 52 and opens into the air inlet casing 37 which is provided with valves and is connected to the intake manifold 6 as clearly shown.

It will be observed that in this construction the passageway through which the air and fuel flows to the engine is on the outside of the exhaust manifold and that the inner wall of this passageway is very thin and is subjected to the heat of the exhaust gases passing through the exhaust manifold. This thinness of at least one of the walls of the air and fuel passageway is important as the temperature thereof increases in proportion to the speed of the engine, it having been discovered that if the walls are thick, excess heat would be stored therein when the engine is running at high speed so that the engine would not properly function when running at a slow speed, at which speed cool walls are required. By making this wall of the fuel and air passage exceedingly thin, the heat therefrom is always proportionate to the speed of the engine as the wall does not store up excessive heat.

Other forms of passageways can, of course, be adopted depending upon the engine to which the device is applied.

The plate or thin wall 44 is preferably made of brass from .010″ to .10″ in thickness, and in actual operation usually this plate is of a thickness of .015″. By reason of its increased conductivity, plates formed of aluminum alloy (e. g. duralumin) may be substituted for the brass plates, and these aluminum alloy plates may have a thickness of .015 to .050″.

In operation air enters through the opening 50 in the outer plate 45. It flows through the restricted passageway formed by the plates 44 and 45. Fuel enters this passageway through the port 49 from a conventional type of float chamber. This fuel is, of course, atomized by the air sweeping through the passageway admitted through the port 45. By reason of the narrow passageway the atomized fuel is more or less in constant contact with the heated thin plate 44 so that it is thoroughly vaporized while sweeping through this passageway to the outlet through boss 51 at one end thereof. This passageway, as clearly disclosed, is of a reduced width intermediate its ends and as the fuel rushes through the passageway toward the gradually enlarged end thereof expansion is permitted so that the velocity of

this fuel is somewhat reduced. After passing through the passageway and undergoing most efficient vaporization the fuel passes through the line into the intake manifold 6, where it is transmitted on to the engine cylinders.

To clean the thin plate 44, it is only necessary to remove the fastening screws 50, whereupon the outer plate 45 can be removed and carbon or other deleterious substance removed from both the plate 45 and the surface of the plate 44. The carbon is preferably removed from both surfaces of the plate 44 inasmuch as accumulations occur thereon by reason of the vaporization of gases on one side of the plate and contact with exhaust gases on the opposite side. As clearly disclosed, this thin plate can be removed with ease.

Having described my invention I claim:—

1. The combination with an internal combustion engine having an exhaust conduit provided with an opening in the outer wall thereof, a thin metallic plate secured to said conduit and fitting over said opening, an outer detachable wall spaced from said thin metallic plate and attached to said exhaust conduit to provide a passageway having a large surface heating area proportionate to the cross sectional area, means for delivering fuel and air to the passageway whereby atomized fuel is swept over the thin metallic plate, a fuel outlet leading from said passageway, the thin metallic plate being of a material and thickenss to possess a low thermal capacity and high thermal conductivity.

2. The combination with an internal combustion engine having an exhaust conduit provided with an opening in one wall thereof, a thin metallic plate closing said opening, an outer wall secured to said exhaust conduit and spaced from said metallic plate to provide a confined passageway therebetween, means for admitting fuel and an atomizing medium to said passageway whereby the fuel is swept over said thin metallic plate, means for conveying a vaporized fuel to an engine, said thin metallic plate being of a material and thickness to possess a low thermal capacity and high thermal conductivity.

In witness that I claim the foregoing I have hereunto subscribed my name this 3rd day of July, 1919.

GEORGE R. WELCH.