E. J. MANNING & H. B. WARNE.

CARBURETER.

APPLICATION FILED JUNE 17, 1916.

1,281,044. Patented Oct. 8, 1918.

Fig. 1.

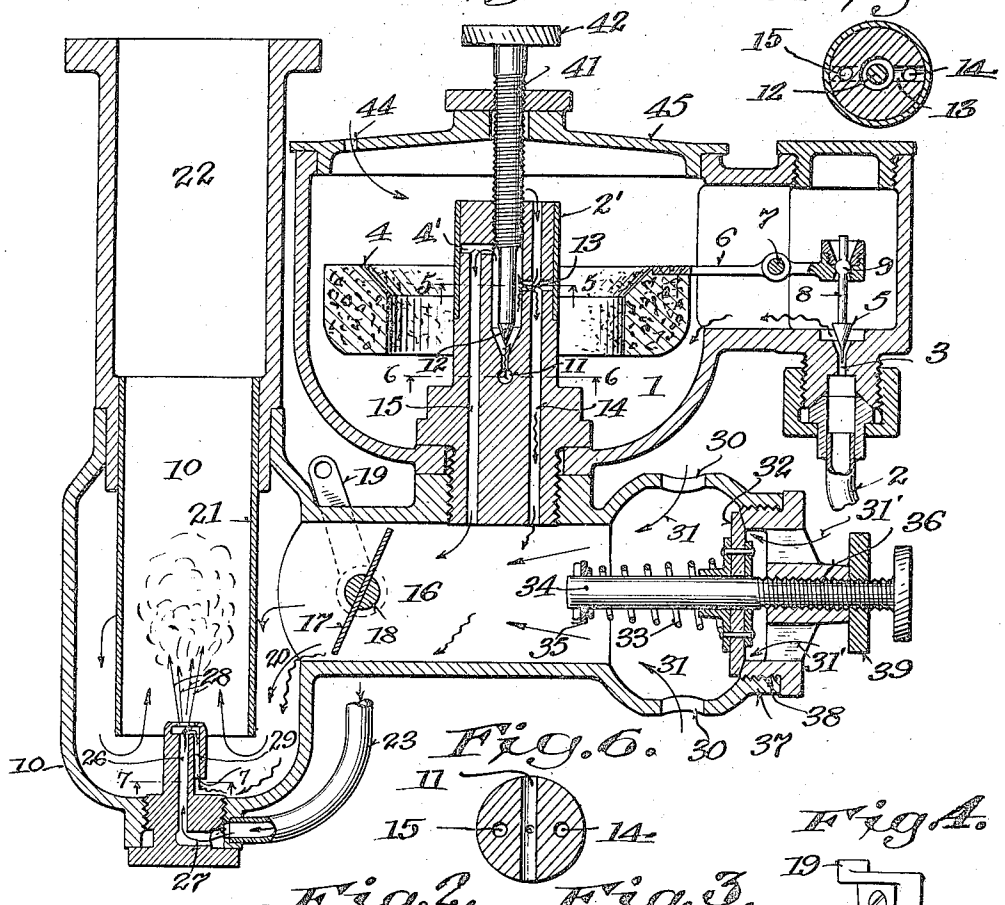

Fig. 5.

Fig. 6.

Fig. 2.

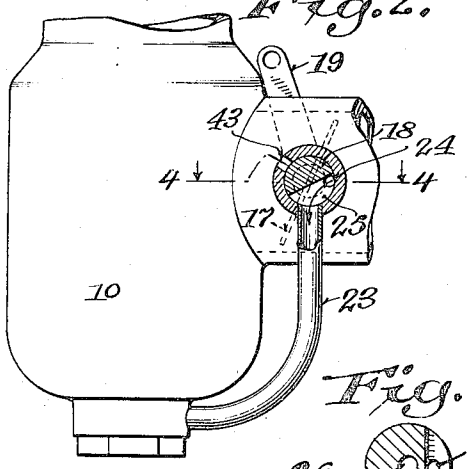

Fig. 3.

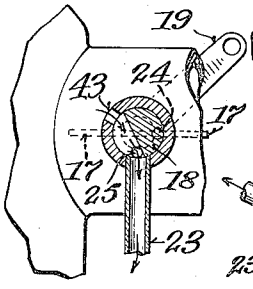

Fig. 4.

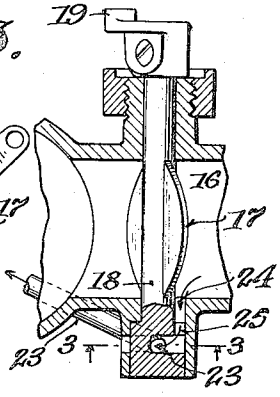

Fig. 7.

Inventors:
Elmer J. Manning
Hilton B. Warne
By Erwin & Muller
Attorneys.

UNITED STATES PATENT OFFICE.

ELMER J. MANNING AND HILLON B. WARNE, OF JANESVILLE, WISCONSIN.

CARBURETER.

1,281,044. Specification of Letters Patent. Patented Oct. 8, 1918.

Application filed June 17, 1916. Serial No. 104,173.

To all whom it may concern:

Be it known that we, ELMER J. MANNING and HILLON B. WARNE, citizens of the United States, residing at the city of Janesville, county of Rock, and State of Wisconsin, have invented new and useful Improvements in Carbureters, of which the following is a specification.

Our invention relates to improvements in that class of carbureters that are used for burning gasolene and other liquid fuel, and it pertains more especially, among other things, first, to the construction in a carbureter of a separate admission chamber and a mixing chamber, which chambers are joined together by a passageway, in which is located a throttle valve; second, to the location of the mixing chamber upon the engine side of the throttle valve; third, to a baffle tube, through which tube the products of combustion are led to the engine; fourth, to the location of an atomizer in the mixing chamber; fifth, to the location of a duct provided with a valve adapted to operate in conjunction with the throttle valve, whereby the atomizer is supplied with air from the admission chamber or partly from the admission chamber and partly from the outside air or wholly from the outside air as the throttle is moved from the closed to the open position; sixth, to the device for producing a rarefied condition of the atmosphere, whereby the liquid will be more readily vaporized between the throttle valve and the engine cylinder, and seventh, to the device for controlling the admission of fuel to the admission chamber. It will be understood that a great advantage is attained over other styles of carbureters from the fact that a high vacuum is produced in the mixing chamber.

Our invention is further explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of our improved carbureter.

Fig. 2 is a detail of the mixing chamber of the carbureter, part broken away to disclose the interior construction.

Fig. 3 is a detail showing the valve disclosed in Fig. 2 in open position.

Fig. 4 is a horizontal section, drawn on line 4—4 of Fig. 2.

Fig. 5 is a horizontal section, drawn on line 5—5 of Fig. 1.

Fig. 6 is a horizontal section, drawn on line 6—6 of Fig. 1.

Fig. 7 is a horizontal section drawn on line 7—7 of Fig. 1.

Like parts are referred to by the same reference numerals throughout the several views.

Liquid fuel is first admitted to the receptacle 1 through the duct 2 and passage 3 with each downward movement of the float 4. The float 4 is connected with the liquid fuel controlling valve 5 through the lever 6, pivotal bolt 7 and valve stem 8, and said valve stem is connected with said lever 6 by the ball bearing 9, as shown in Fig. 1. Liquid fuel passes from the receptacle 1 to the mixing chamber 10 through the horizontal duct 11, when it passes from said duct 11 up past the manually operated valve 12, and thence out through the duct 13, as indicated by the arrows, and thence down through the duct 14 into the chamber 16 from which it passes into said mixing chamber 10 past the butterfly valve 17, when said valve is opened. The liquid fuel is drawn up to the passage 13 by the suction of air through the duct 15. The butterfly valve 17 is connected to the inner end of the stem 18, and the outer end of said stem is connected with the operating lever 19, whereby said valve may be manually opened and closed. When the butterfly valve 17 is wholly or partially opened, as shown in Figs. 1 and 2, the air and liquid fuel are free to pass said butterfly valve into the mixing chamber 10, as indicated by the arrows 20. As the air thus enters the mixing chamber it is brought in contact with the vertical tubular member 21, which tubular member serves as a baffle plate to break up the direct current of air so that it flows evenly into the lower end of the tube 21, where it becomes thoroughly mixed with the liquid fuel from the duct 29 before passing to the engine through the duct 22. When the butterfly valve 17 is partly opened, as shown in Figs. 1, 2 and 3, air to spray the liquid fuel is caused to pass to said mixing chamber from the chamber 16 through the by-pass duct 23. The upper end of said duct 23 is connected with the chamber 16 through the horizontal ducts 24 and 25, while said duct 23 is connected with the spray duct 26 through the horizontal duct 27, whereby a quantity of air is caused to pass

upwardly in said spray duct 26 by the suction of the engine, as indicated by the arrows 28. As the air passes up through and out of said spray duct 26 it sucks up gasolene through the duct 29, and forms a spray therewith so that the air entering said mixing chamber around the lower edge of the tube 21 becomes thoroughly mixed with liquid fuel before passing to the engine. Air is free to enter the chamber 16 through a plurality of apertures 30, as indicated by the arrows 31, 31. When, however, the supply of air thus admitted is for any reason deficient the valve 32 will be caused to open by a partial vacuum with each forward movement of the piston in said engine, whereby a quantity of air is admitted to said chamber 16 past said valve 32, as indicated by the arrows 31', 31'. The valve 32 is held to its seat by the spiral spring 33, and said spiral spring 33 is supported upon the manually operated valve stem 34, said spring being interposed between the valve 32 and the transverse pin or bearing 35, whereby said valve 32 is forced to its seat by the recoil of said spring 33. The valve stem 34 is adjustably supported in the webbed nut 36, and said wing nut 36 is secured to the walls 37 of the chamber 16 by a screw threaded joint 38. 39 is a lock nut of ordinary construction, said lock nut 39 being turned back on said valve stem, preparatory to moving said stem in either direction. Said valve stem may be turned forwardly or rearwardly as desired, whereby the tension on said spiral spring 33 is readily increased or diminished. The object of the sleeve 2' is to close the outer end of the small horizontal duct 4'. It will be understood that, from a mechanical standpoint, it would be difficult to form the horizontal duct 4' at right angles to the duct 15' if such cylindrical sleeve 2' were not used. Before attaching the sleeve 2', however, such duct may readily be formed when the outer end is closed as such sleeve 2' is put in place.

We are aware of the fact that similar receptacles 1 have previously been provided with floats 4 and liquid controlling valves 5, whereby the admission of gasolene to a carbureter is controlled. Invention herein, however, is predicated more especially, as stated upon the mechanism for controlling the admission of air and liquid fuel to the chambers 16 and 10, to the mechanism for controlling the passage of air and liquid fuel to the mixing chamber, and to the location of the tube 21 in front of the chamber 16, whereby the air and liquid fuel passing from said chamber 16 into the mixing chamber 10 is brought in direct contact with the side of said tube 21, and thereby becomes more thoroughly mixed before passing to the engine.

It will, of course, be understood that the duct 11 may be closed by turning down the manually operated valve 12, the movement of said valve being controlled by the screw threaded valve stem 41 and operating knob 42.

When the engine is run at high power and the valve 17 is in the position shown in Fig. 3 the duct 25 is moved out of register with duct 24 and the by-pass duct 23 is brought into communication with the atmosphere through the duct 43, thus admitting full atmospheric air pressure to the spray duct 26 which is of great advantage at high power. Air is admitted into the chamber 1 through the duct 44 in the cover plate 45 of said chamber.

Having thus described our invention what we claim as new and desire to secure by Letters Patent, is—

In a device of the described class, the combination of a receptacle, a float located in said receptacle, a valve for controlling the admission of liquid to said receptacle, means operated by said float for opening and closing said valve, a vertical column located in said receptacle provided with a horizontal and a plurality of vertical ducts, a cover fitted to the mouth of said receptacle, an air aperture formed in said cover, a valve stem projecting at one end through an aperture in said cover and having threaded bearings near its opposite end in said column, a valve formed on the inner end of said stem, said valve being adapted to be operated by turning a knob formed on the protruding end of said stem, whereby the passage of liquid from said receptacle to said column is controlled, an intermediate chamber connected with the lower end of said receptacle, adapted to receive liquid from the vertical ducts of said column, means for controlling the admission of air to said intermediate chamber, means for controlling the admission of air from said intermediate chamber to a mixing chamber, a baffle tube located in said mixing chamber, a spray duct adapted to discharge spray into the lower end of said baffle tube, a duct communicating from said intermediate chamber to said spray duct, all substantially as and for the purpose specified.

In testimony whereof we affix our signatures in the presence of two witnesses.

ELMER J. MANNING.
HILLON B. WARNE.

Witnesses:
H. S. HAGGART,
E. H. MEAD.