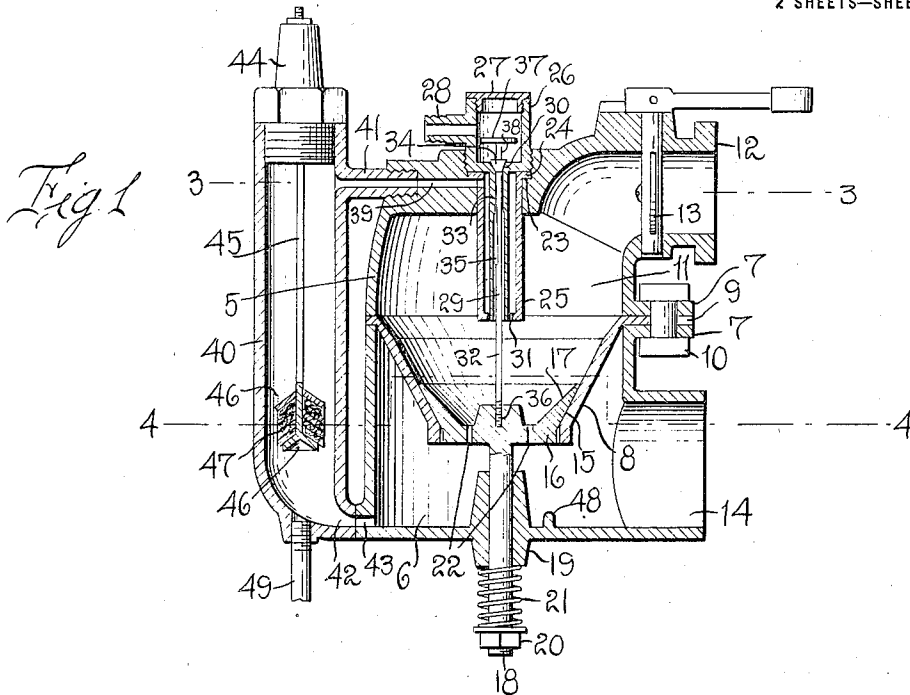
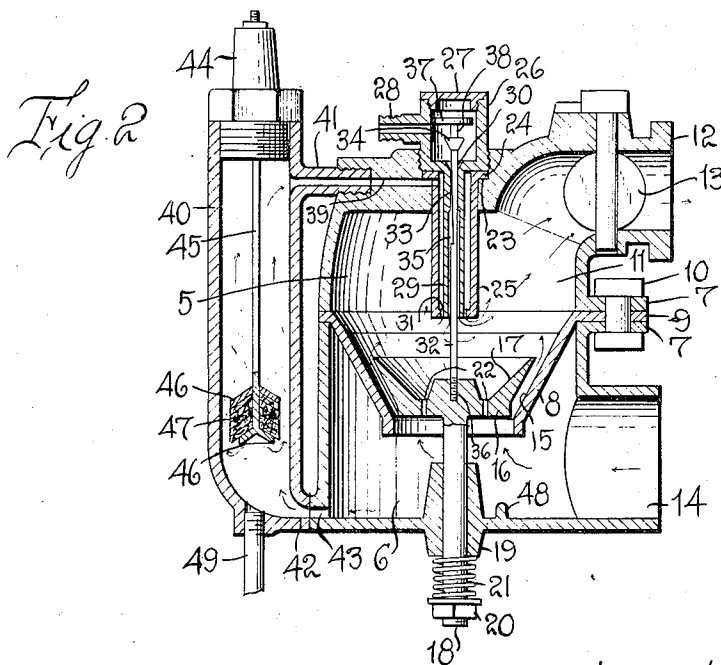


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MIXING VALVE FOR CARBURETERS.
APPLICATION FILED OCT. 16, 1916.

1,262,298.

Patented Apr. 9, 1918.

2 SHEETS—SHEET 1.



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Fig. 3

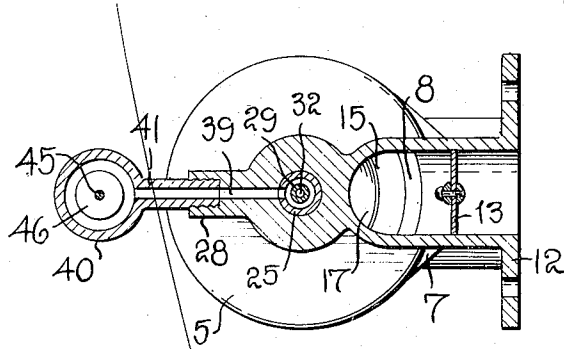


Fig. 4

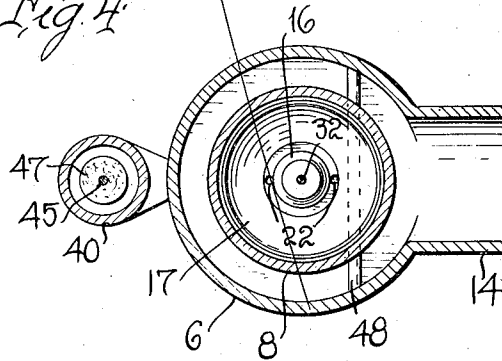


Fig. 6

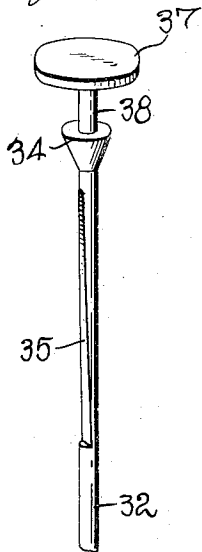
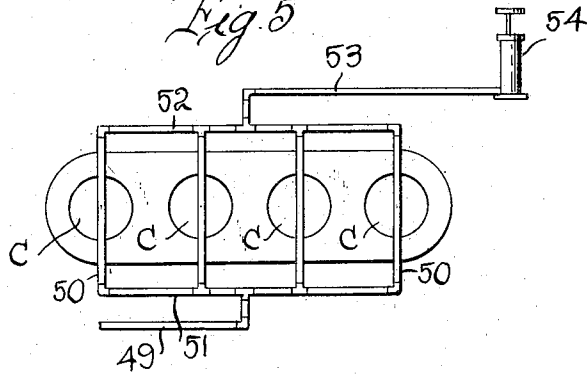


Fig. 5



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UNITED STATES PATENT OFFICE.

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MIXING-VALVE FOR CARBURETERS.

1,262,298.

Specification of Letters Patent.

Patented Apr. 9, 1918.

Application filed October 16, 1916. Serial No. 125,932.

To all whom it may concern:

Be it known that I, JAMIE H. BATCHELOR, a citizen of the United States, residing at Savannah, in the county of Chatham and State of Georgia, have invented certain new and useful Improvements in Mixing-Valves for Carbureters, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to an improved mixing valve for carbureters and has for its primary object to provide a valve automatically operated by suction from the engine cylinders to admit a fuel to the mixing chamber, in combination with means for vaporizing the liquid fuel prior to its admission to the mixing chamber.

15 It is a more particular object of the invention to provide a suction-operated valve element controlling the supply of air to the mixing chamber, a heat receiving chamber extending into the mixing chamber, a fuel supply tube extending through the heating chamber and having a valve seat at one end, 20 a needle valve operatively connected to the suction-operated valve and moved therewith to its open position, and means for supplying a heating medium to said heat receiving chamber, whereby the fuel, in its passage through said tube, is vaporized.

25 It is another important object of the invention to provide means whereby the fuel valve tube may be heated to a very high temperature after the engine is started in operation, said means including air supply tubes extending through the engine cylinder heads or the exhaust so that the air will be heated from the explosion of the mixture in the engine cylinders in the continued operation of the engine.

30 It is a further general object of the invention to provide a device for the above purpose which is simple in construction, positive in its action, and capable of vaporizing unrefined hydrocarbon fuels, such as kerosene and the like, for use in the propulsion of motor vehicles.

35 With the above and other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawings, in which,

Figure 1 is a vertical section through a

carbureter provided with my improved mixing valve and vaporizing means;

Fig. 2 is a similar view showing the air inlet and fuel control valves in their open positions;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1;

Fig. 4 is a similar view taken on the line 4—4 of Fig. 1;

Fig. 5 is a diagrammatic plan view showing the arrangement of the air pipes or tubes in the engine cylinder heads; and

Fig. 6 is a detail perspective view of the needle valve.

Referring in detail to the drawings, 5 and 6 respectively indicate the upper and lower sections of the carbureter casing, said casing sections each being provided with outwardly projecting flanges 7, between which the flange 9, formed on the valve seat member 8, is disposed. These flanges 7 and 9 are provided with openings to receive the fastening bolts 10. The upper section 5 of the carbureter casing constitutes the mixing chamber indicated at 11, and said casing section is formed with a nipple 12 connected to the intake ports of the engine cylinders by a pipe or conduit in the usual manner. A butterfly valve, indicated at 13, is suitably mounted in the outlet of the mixing chamber 11, whereby the supply of the combustible mixture to the engine cylinders can be controlled and regulated. The lower section 6 of the carbureter casing is also provided with a laterally projecting nipple 14 for the connection of a pipe or conduit thereto, through which air is admitted beneath the valve seat member 8. Any preferred means may be employed for heating the air to any desired temperature.

The valve seat member 8 extends downwardly into the casing section 6 and has its walls inwardly inclined to provide a beveled or inclined seating face 15 for the annular, outwardly inclined flange 17 formed upon the valve disk 16. This valve disk is centrally provided with a cylindrical stem 18 longitudinally movable through a guide boss 19 formed upon the base wall of the casing section 6. A nut 20 is threaded upon the lower end of said stem, and between the nut and the boss 19 a coil spring 21 is arranged, said spring normally urging the valve downwardly and holding the same

in closed position upon its seat. The valve disk 16 is provided at diametrically opposite points with apertures 22, the purpose of which will be presently explained.

5 An opening is formed through the top wall of the casing section 5, the lower portion of said opening being reduced in diameter to provide a shoulder 23 upon which is seated an annular flange 24 formed upon the
10 upper end of a cylindrical shell or casing 25 which extends downwardly into the mixing chamber 11. The upper end portion of the opening in the casing wall is threaded to receive the threaded lower end of a chamber 26, the upper end of which is closed by a suitable cap 27. To a laterally projecting nipple 28 extending from the casing, a tube or conduit, connected to the fuel tank or reservoir, is attached. The chamber 26
20 has an elongated, cylindrical tube 29 integrally formed with its base wall, the bore of said tube communicating with the interior of the chamber 26 and being flared to provide the valve seat 30. The tube 29 extends entirely through the casing 25 in spaced relation to the walls of the latter, and has its lower end slightly spaced from the edge of the opening 31 formed in the bottom wall of the casing 25. A needle
30 valve rod 32 is disposed through the bore of the tube 29, said bore being contracted or reduced in diameter, as at 33, for a short distance below the valve seat 30, so that the rod 32 will snugly engage therewith. This
35 rod, upon its upper end, is formed with a conical valve head 34 for engagement on the seat 30 and in spaced relation to the head 34 the rod 32 is longitudinally cut away or recessed upon one side, as at 35. The lower
40 end of the rod 32 has a threaded connection, as at 36, to the valve disk 16 so that when this valve disk is in its closed position, the valve head 34 on the rod is also tightly engaged upon its seat 30 to cut off the supply
45 of fuel to the mixing chamber. A dash plate 37 is vertically movable in the chamber 26 and connected by a short stem 38 to the valve head 34. This dash plate acts in the usual manner to prevent vibration of the valve and insure a steady, even movement of
50 the same.

The upper end of the casing 25, immediately below the flange 24, has an opening in one side thereof with which the inner end
55 of a horizontal passage 39, formed in the wall of the casing section 5, communicates. A vertically disposed pipe or conduit 40 is provided adjacent its upper end with a laterally projecting, threaded nipple 41 for connection to the casing 5, the bore of the nipple being in alinement with the passage 39. The lower end of this pipe 40 has a laterally contracted inlet 42 with which an opening 43 formed in the side wall of the
60 casing section 6, at the base thereof, com-

municates. A spark plug 44 is threaded in the upper end of the pipe 40 and has an electrode 45 extending longitudinally through said pipe to a point adjacent its lower end. This electrode is provided with spaced,
70 shallow, conical disks 46, between which asbestos or other absorbent material indicated at 47 is disposed to constitute a wick. Upon the base wall of the casing section 6, at one side of the valve stem 18, an internal,
75 upstanding, transverse rib 48 is formed. This rib prevents the flow of liquid fuel dripping through the apertures 22 of the valve 16 into the air inlet nipple 14.

To the lower end of the pipe or conduit 80 40 and substantially in line with the electrode 45, the end of a pipe or tube 49 is connected. In Fig. 5 of the drawings, I have shown the engine cylinders C, the heads thereof being removed. In applying
85 the present invention to motor vehicle engines having the detachable cylinder heads, a pipe 50 is disposed transversely through a metal plate or gasket which is interposed between the detachable heads and the upper
90 ends of the cylinder casting, one of such pipes extending transversely through the compression chamber of each cylinder. The ends of these pipes 50 are suitably coupled to longitudinal pipes 51 and 52 respectively,
95 extending longitudinally upon opposite sides of the engine cylinder. To the pipe 51, the pipe 49 is coupled. A pipe or tube 53 is connected to the other of the pipes 52 and to the cylinder of a suitable hand pump
100 indicated at 54, which may be mounted in any convenient position upon the dashboard of the vehicle body

At the start of the operation of the engine, upon the creation of a vacuum in the engine
105 cylinders, the valve disk 16 is drawn upwardly to its open position, which also lifts the head 34 of the needle valve rod from its seat and permits the liquid fuel to flow downwardly through the tube 29, the recessed side 35 of said rod being positioned
110 in the reduced upper end portion 33 of the tube bore. The fuel flows downwardly around the rod and enters the mixing chamber where it is mixed with the incoming
115 heated air drawn through the nipple 14. A portion of the oil will collect in the cup-shaped valve 16 and drip through the apertures 22 therein and collect upon the bottom wall of the casing section 6. This oil flowing
120 through the opening 43 into the lower end of the pipe 40 is directed upwardly by the air jet from the pipe 49, created in the operation of the hand pump 54. The circuit for the spark plug 44 being closed, a
125 spark will jump from the lower end of this electrode to the adjacent wall of the pipe 40, and this oil which is thus driven against the lower end of the electrode and the absorbent material 47, is ignited and the flame and
130

heated air rises through said pipe and enters the passage 39. This highly heated air entering the casing 25 soon heats the tube 29 to a high temperature so that the liquid fuel in its passage downwardly through this tube, will be completely vaporized. After the engine has been started in operation, the circuit for the spark plug is opened and the air will then be heated in its passage through the several pipes 50 traversing the compression chambers of the engine cylinders, and drawn into the casing 25 surrounding the valve tube 29. It will, therefore, be understood that the spark plug is used to ignite the fuel absorbed by the material 47, only in the initial or starting operation.

From the foregoing description, taken in connection with the accompanying drawing, the construction, manner of operation and several advantages of the invention will be clearly and fully understood. By means of my improved mixing valve and vaporizing device, the necessity of employing a float valve, as is usual in carbureters, is entirely obviated. The valve mounting and arrangement is exceedingly simple, and positively operated by the creation of a vacuum in the engine cylinders on each intake stroke of the piston. As the air and fuel control valves operate in unison and the fuel is completely vaporized before it enters the mixing chamber, it will be appreciated that the invention may be employed for use in the utilization of kerosene and other relatively heavy, unrefined hydrocarbon oils. The device has been found highly satisfactory in practical use, reducing the expense incident to the consumption of fuel to a material extent. I have above described the preferred form and construction of the several parts of the apparatus, but it will, of course, be manifest that the mounting and arrangement of the fuel and air valves, as well as the heating means, may be varied in many respects. The form and construction of the several elements referred to is also susceptible of considerable modification and I, therefore, reserve the privilege of adopting all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

Having thus fully described my invention, what I desire to claim and secure by Letters Patent is:—

1. In a carbureter, a casing having a mixing chamber and a fuel supply tube extending into said chamber, air and fuel control valves, in combination with means for heating the fuel supply tube to vaporize the liq-

uid fuel, said means including a fuel absorbent material, means for supplying air thereto and means for igniting said material.

2. In a carbureter, a casing having a mixing chamber and a fuel supply tube extending into said chamber, air and fuel control valves, a casing surrounding the fuel supply tube, in combination with a conduit in communication with one end of said casing, said conduit having an air inlet, an absorbent material in said conduit, means for saturating said material with the liquid fuel, and means for igniting the saturated material.

3. In a carbureter, a casing having a mixing chamber and a fuel supply tube extending into said chamber, air and fuel control valves, a casing surrounding the fuel supply tube, in combination with a conduit in communication with one end of said casing, and means for supplying a combustion supporting medium to said conduit for admission to the casing, whereby the liquid fuel is vaporized in its passage through the tube.

4. In a carbureter, a casing having a mixing chamber and a fuel supply tube extending into said chamber, air and fuel control valves, a casing surrounding the fuel supply tube, in combination with a conduit in communication with one end of said casing, a spark plug mounted in one end of the conduit and having a longitudinally extending electrode, an absorbent material on said electrode, and means for saturating the absorbent material with a liquid fuel, whereby the same is ignited when the spark plug circuit is closed and a combustion supporting medium supplied to said casing to vaporize the liquid fuel in its passage through the tube.

5. The combination with a carbureter having a mixing chamber and a liquid fuel supply tube extending into said chamber, of a conduit opening at one of its ends in proximity to the fuel supply tube, air supply pipes heated by the exploded gases in the engine cylinders and connected to one end of the conduit to supply the heated air thereto, an absorbent material arranged in said conduit, a force pump connected to the air pipes to deliver an air jet upon a combustible fluid and direct the same upon the absorbent material, and means for igniting the absorbent material.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JAMIE H. BATCHELOR.

Witnesses:

M. C. LYDDANE,
M. R. WILSON.