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KEROSENE VAPORIZER FOR INTERNAL COMBUSTION ENGINES.

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1,319,718. Patented Oct. 28, 1919.

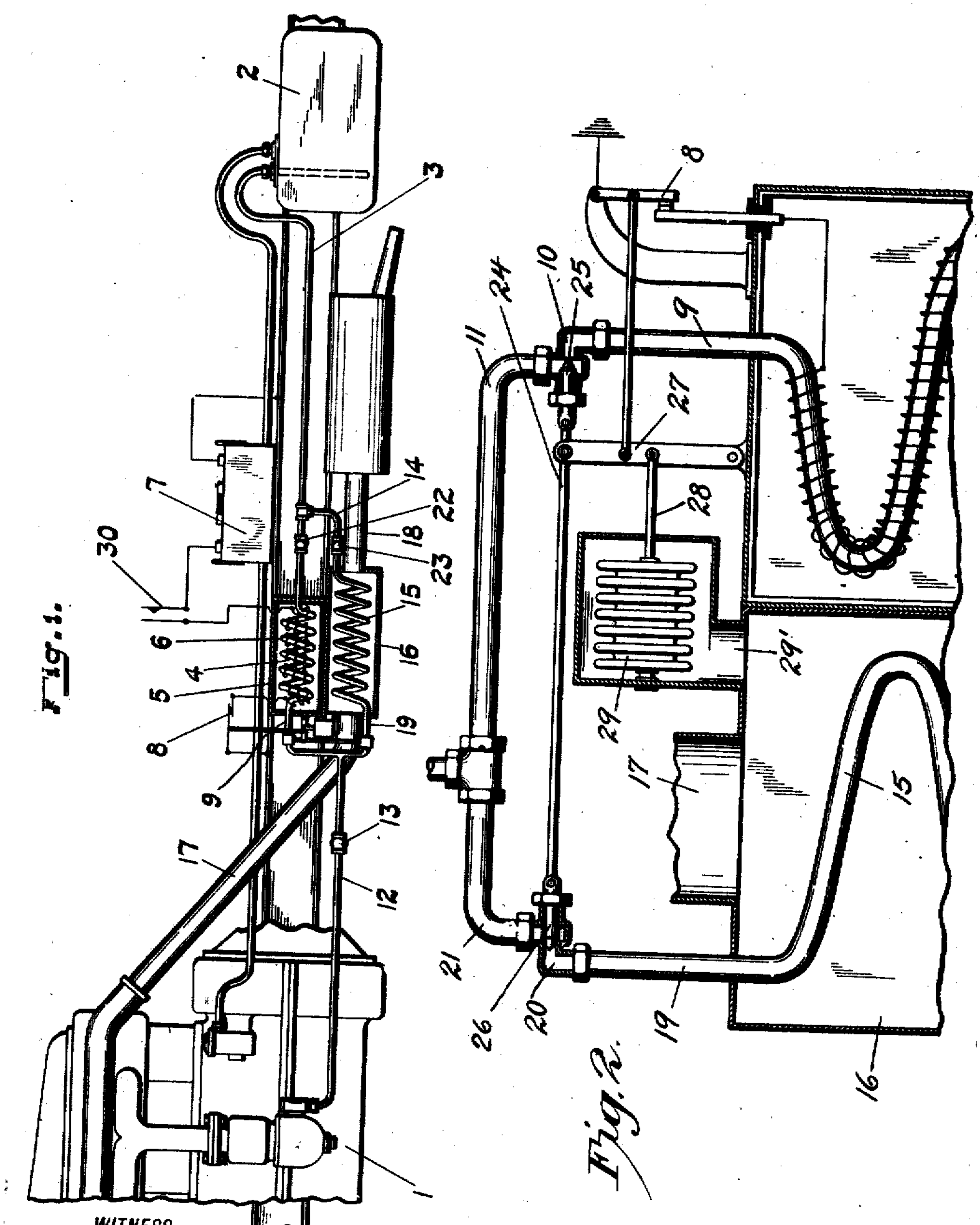

Fig. 1.

Fig. 2.

WITNESS

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LEWIS H. MARTIN, OF INDIANAPOLIS, INDIANA.

KEROSENE-VAPORIZER FOR INTERNAL-COMBUSTION ENGINES.

1,319,718. Specification of Letters Patent. Patented Oct. 28, 1919.

Application filed October 8, 1917. Serial No. 195,411.

To all whom it may concern:

Be it known that I, LEWIS H. MARTIN, a citizen of the United States, residing at Indianapolis, Marion county, and State of Indiana, have invented and discovered certain new and useful Improvements in Kerosene-Vaporizers for Internal-Combustion Engines, of which the following is a specification.

My invention relates to kerosene vaporizing means for internal combustion engines, and its object is to provide means whereby the kerosene may be effectively vaporized prior to the starting of the engine, and whereby after the engine has started such initial heating means are automatically cut off and the heat for effecting the further vaporization of the fuel is derived from the exhaust gases of the engine.

With this object in view, my invention is embodied in preferable form in the construction and arrangement hereinafter described and illustrated in the accompanying drawings.

In these drawings, Figure 1 is a longitudinal side elevation, partly in vertical section, of a part of an internal combustion engine with fuel connections and with my improvements applied thereto; and Fig. 2 an enlarged detail side elevation partly in section of the automatic thermostatic controller element for the two sources of heat.

Referring to the drawings, 1 indicates an internal combustion engine and 2 a fuel tank adapted to receive kerosene. Leading from this tank is a fuel conducting pipe 3 which connects with or has formed as part thereof a worm or coil 4 located in a suitable casing 5 and adapted to be surrounded by a coil of wire 6 constituting an electric heating member and in suitable circuit with a battery 7 and with switch contact 8. The worm 4 is continued by means of an extension 9 into a junction and valve casing 10 from which a branch pipe 11 leads down to a main carbureter supply conduit 12 which may be provided with a suitable check valve 13.

Between the electrically heated chamber 5 and the fuel tank there is connected to the main pipe 3, a branch pipe 14 which is also connected to or has formed as part thereof a worm or coil 15 located in a casing 16 constituting a heating chamber. Said chamber is adapted to receive at each end the two sections 17 and 18 of an exhaust pipe adapted to convey the hot exhaust gases from the exhaust manifold of the engine to the chamber so as to thereby heat the worm or coil 15. This worm is continued by an extension 19 into a junction and valve casing head 20 which in turn communicates by a branch pipe 21 with the carbureter supplying pipe 12.

Between the junction of the pipe 14 with the main pipe 3, and the heating chamber 5, is located a check valve 22 adapted to prevent the return flow of the kerosene from the worm in the electrically heated chamber and a similar check valve 23 is mounted in the pipe 14.

To control the supply of heat from either one of the two sources, namely, the battery and the exhaust manifold, a thermostatic controller is provided which comprises a reciprocable valve rod 24 carrying at end a valve 25 which is adapted to close the entrance to the valve casing 10 or open the same, and carrying at its end a similar valve 26 adapted to control communication from the pipe 19 to the carbureter supplying pipe 12, and it will be seen that these valves are so arranged that when one valve is closed the lower one will be open and vice versa. The valve rod is adapted to be operated by a lever 27 fulcrumed at its inner end to a suitable part of the frame and having pivotally connected thereto an arm 28 which is connected to the active element of a thermostat 29. This thermostat is mounted adjacent to the exhaust conveying pipe 17 and communicates with the exhaust heated chamber 16 through the opening 29′ and is operable by variations in the temperature of the gases passing through said chamber.

In the operation of the device, when the engine is started by suitable mechanism, the kerosene which is under pressure in the tank 2, is admitted to the pipe 3 and thence flows to the worm 4 and thereupon the switch 30 being closed, an electric circuit will be established through the heating coil 6 surrounding the worm, from the battery 7 which coil will be sufficiently heated to impart sufficient heat to the worm as to vaporize the kerosene passing therethrough, whereby the engine will be supplied with kerosene vapor for the initial running of the same. This vapor will be conducted through the pipes 9 and 12 to the carbureter. When the engine has become fully started and the exhaust gases have raised the temperature of the pipe 17 and chamber

16 to a predetermined degree, the heat from said chamber will cause the expanding element of the thermostat 29 to be raised, thus moving the lever 27 and carrying upward the valve rod 24 so as to seat the valve 25 and cut off communication between the pipe 9 and the pipe 12, thus preventing the flow of kerosene through the electrically heated worm 4. At the same time the circuit through the electrical heating coil 6 will be broken at the switch contacts 3 by the upward movement of the lever 27. The kerosene will then flow from the pipe 13 through the branch pipe 14 and into the worm 15 in the gas heated chamber 16 and will be sufficiently heated by the hot exhaust gases to vaporize the kerosene in the worm, and the resulting vapor will be led through the pipe 19 into the carbureter.

Having thus described my invention, what I claim is:

1. The combination with an internal combustion engine, a source of liquid hydrocarbon, a casing located intermediate said liquid source and the engine and providing independent chambers, a fuel passage pipe in each of said chambers and communicating respectively with said liquid source and the engine, a common controlling means for the fuel passing through said fuel passage pipes, an electric heating coil for initially vaporizing the fuel passing through the fuel pipe in one of said chambers, means for conducting the engine exhaust gases to heat the fuel pipe in the other of said chambers, and means operable by the engine exhaust gases to break the circuit through the electrically heated coil and ac' ate said controlling means to stop the flow of fuel heated thereby and open the fuel supply from the pipe in the exhaust gas heated chamber, substantially as set forth.

2. The combination with an internal combustion engine, a source of liquid hydrocarbon, a casing located intermediate said liquid source and the engine and provided with independent chambers, a spiral pipe for fuel passage through each of said chambers and communicating respectively with said liquid source and the engine, valves for controlling the passage of fuel through said pipes respectively, an electric heating coil for initially vaporizing the fuel passing through the fuel pipe coil in one of said chambers, means for conducting the engine exhaust gases to heat the fuel pipe coil in the other of said chambers, and means operable by the engine exhaust gases to break the circuit through the electrically heated coil and actuate said valves to stop the flow of fuel passing therethrough and open the fuel supply from the pipe coil in the exhaust gas heated chamber, substantially as set forth.

3. In combination with an internal combustion engine, a source of liquid hydrocarbon, a fuel feeding pipe having parallel branched passages connecting the fuel source and the engine, means for heating one of said pipe branches by the exhaust gases from the engine to normally vaporize the fuel, means independent of the engine for heating the other of said pipe branches to initially vaporize the fuel, valves controlling the passage of fuel through said branch pipes respectively, a rod connecting said valves, a fulcrumed lever connected to actuate said rod and open and close said valves alternately, a thermostatic control for said lever operable by the exhaust gases of the engine, and means actuated by the thermostat controlled lever for controlling said independent fuel heating means, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 3d day of October, A. D. nineteen hundred and seventeen.

LEWIS H. MARTIN. [L. S.]

Witnesses:

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