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VAPORIZER FOR COMBUSTION ENGINES.

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Fig. 1.

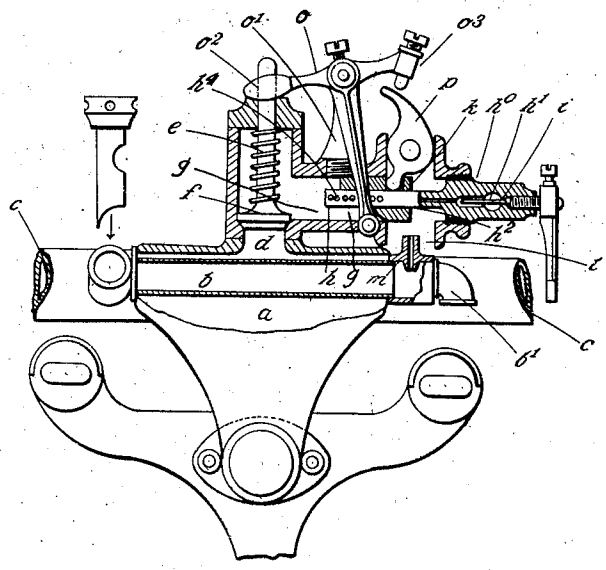
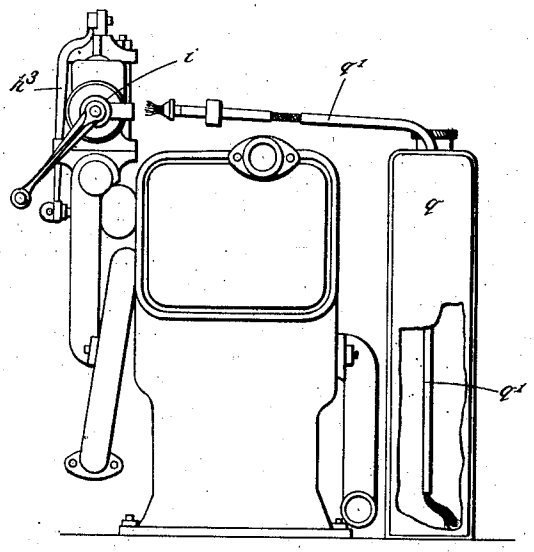


Fig. 2.



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UNITED STATES PATENT OFFICE.

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VAPORIZER FOR COMBUSTION-ENGINES.

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To all whom it may concern:

Be it known that I, WALTER HENRY HAYES, a subject of the King of Great Britain and resident of London, England, have invented certain new and useful Improvements in Vaporizers for Combustion-Engines, of which the following is a specification.

This invention relates to vaporizers for internal-combustion engines where paraffin or like oil is employed and in which a proportion of the exhaust gases from the engine are introduced into the mixture of fuel and air, the heat of the exhaust gases from the engine being employed to heat a vaporizing chamber for the vaporization of the mixture before it enters the induction pipe of the engine.

In a vaporizer made in accordance with this invention the exhaust gases issue from a nozzle and pass into an air inlet leading to a conduit in which is mounted a piston valve (hereinafter referred to as the "controlling valve") located beyond the said air inlet and sliding upon an axially disposed fuel nozzle having lateral perforations, whereby said piston valve controls the admission of air, exhaust gases and fuel to said conduit, from which the mixture passes to a mixing chamber provided with a valve (hereinafter referred to as the main valve) through which the mixture is admitted to a vaporizing chamber of tapered form traversed at its upper and widest part by a heating pipe conveying exhaust gases. The entering mixture impinges directly upon said heating pipe and is drawn off from the lower and smaller end of the vaporizing chamber into the induction pipe of the engine. The main and controlling valves are operated from an adjustable lever whereby the said valves may be opened simultaneously or at such relative times as will secure the best working results.

The accompanying drawings illustrate one construction of vaporizer made in accordance with this invention. Figure 1 is a side elevation, partly in section, and Fig. 2 is an end view showing the apparatus fitted in position, and also the paraffin tank and the wick feed connection.

In the drawing, m is a nozzle by which exhaust gases from the heating pipe b pass through the air inlet l into a conduit g in which is mounted the controlling piston valve k located beyond the gas nozzle m and air inlet l and adapted to slide upon an axially disposed fuel nozzle h having lateral perforations h^4. The nozzle h is carried by a plug h^0 screwed into the end of the conduit g and provided with a needle valve i to which the paraffin is fed through an opening h^1 by a wick inclosed in a pipe q^1 (Fig. 2), which is carried down to the bottom of the paraffin tank q.

The controlling piston valve k is cut away on its under side so as to more quickly admit the fuel, air and exhaust gases, and for the same purpose the said valve may be fluted around its circumference at its forward end.

The conduit g opens into a mixing chamber e in which is located the main valve f seated over the inlet d to the vaporizing chamber and pressed upon its seat by a spring, the spindle of the valve extending out through the upper end of the chamber e. The inlet d opens into the upper and widest part of the vaporizing chamber a which is traversed by a heating pipe b connected at one end to the exhaust pipe c and opening into the atmosphere at the other end b^1.

o is a rocking lever operated by an arm h^3 and adapted to actuate both the main valve f and the controlling valve k, for which purpose one end of the lever projects through the protruding end of the spindle of the valve f, while the other end is provided with an adjustable stop o^3 adapted to engage with the upper cam-like end of a pivoted lever p the lower end of which is furnished with a knob engaging a recess in the controlling piston valve k.

In operation, the actuation of the rocking lever o serves to open the main valve f and to slide the controlling piston valve k backward to uncover the perforations h^4 in the nozzle h and to permit the air from the inlet l and exhaust gases from the nozzle m to enter the conduit g and the mixing chamber e. The nozzle m is adapted to act as an injector whereby the gases issuing therefrom serves to draw in and heat the air before coming into contact with the fuel. The mixture passes from the mixing chamber through the inlet d to the vaporizing chamber, on entering which the said mixture impinges directly upon the heating pipe b through which the exhaust gases are passing, and in this way it is possible to obtain a very efficient and certain operation of the

engine when running with paraffin or like liquid fuel after the exhaust pipe and the vaporizing chamber have been heated up by running the engine for a sufficient time with petrol or like light hydrocarbons.

What I claim is:—

1. A vaporizer for internal-combustion engines working with paraffin or the like liquid fuel, comprising a vaporizing chamber, a heating pipe passing through said chamber for conveying exhaust gases from the engine; a mixing chamber for the exhaust gases, air, and fuel, a main inlet valve between said mixing and vaporizing chambers, an air inlet to said mixing chamber together with an inlet for the exhaust gases—a fuel nozzle with needle valve control, a wick feed to said fuel nozzle, a controlling valve mounted so as to slide axially in relation to said fuel nozzle and controlling the inlet of fuel, and exhaust gases and air to said mixing chamber and means for actuating both the main and controlling valve from one lever.

2. A vaporizer for internal-combustion engines working with paraffin or the like liquid fuel, comprising a mixing chamber, a vaporizing chamber leading from said mixing chamber to the induction pipe of the engine, a pipe conveying exhaust gases whereby said vaporizing chamber is heated, a main valve between said mixing and vaporizing chambers, a conduit for admitting fuel, air and exhaust gases to said mixing chamber, a fuel supply nozzle located axially of said conduit, a controlling piston valve slidably mounted in said conduit and controlling the inlet of fuel, air and exhaust gases thereto, and means for simultaneously operating both the main valve and the controlling piston valve.

3. A vaporizer for internal-combustion engines working with paraffin or the like liquid fuel, comprising a heating and vaporizing chamber of wider dimensions at one end than the other and connected at its narrowest end to the induction pipe of the engine, a pipe conveying gas from the exhaust of the engine and passing through the widest part of said chamber, a mixing chamber for the exhaust gases, air and fuel; a spring-pressed main inlet valve leading from said mixing chamber to said vaporizing chamber, a conduit leading to said mixing chamber, an elongated fuel supply nozzle provided with lateral perforations and disposed axially in the said conduit, an air inlet to said conduit, and an exhaust gas supply nozzle projecting into said air inlet whereby the gases issuing from said nozzle operate as an injector carrying air into said conduit, a controlling piston valve sliding in said conduit and upon the elongated fuel feeding nozzle, said controlling piston valve being located between the air inlet and the mixing chamber, and controlling the inlet of air, gases and fuel; a rocking lever operating rocking lever, for the purpose of controlling piston valve and means for operating said rocking lever, for the purpose of controlling said valves.

4. A vaporizer for internal-combustion engines working with paraffin or like liquid fuel, comprising a vaporizing chamber of wider dimensions at one end than at the other and connected at its narrowest end to the induction pipe of the engine, a heating pipe conveying gases from the exhaust of the engine and passing through the widest part of said vaporizing chamber, a mixing chamber, a main valve leading from said mixing chamber to the widest part of said vaporizing chamber, a nozzle through which a portion of the exhaust gases from said pipe pass, an air inlet associated with said exhaust gas nozzle whereby the latter acts as an injector to draw in and heat the air supply, a controlling valve located between said air and exhaust gas nozzle and the said main valve whereby the admission of said portion of the exhaust gases and air to the mixing chamber is controlled, and a fuel inlet nozzle projecting axially through said controlling valve, and means for operating both said main and controlling valves whereby the main valve is opened before the controlling valve admits the mixture of exhaust gas and air to the mixing chamber

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