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FUEL HEATER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED MAY 15, 1917.

1,291,564. Patented Jan. 14, 1919.

Fig. 1.

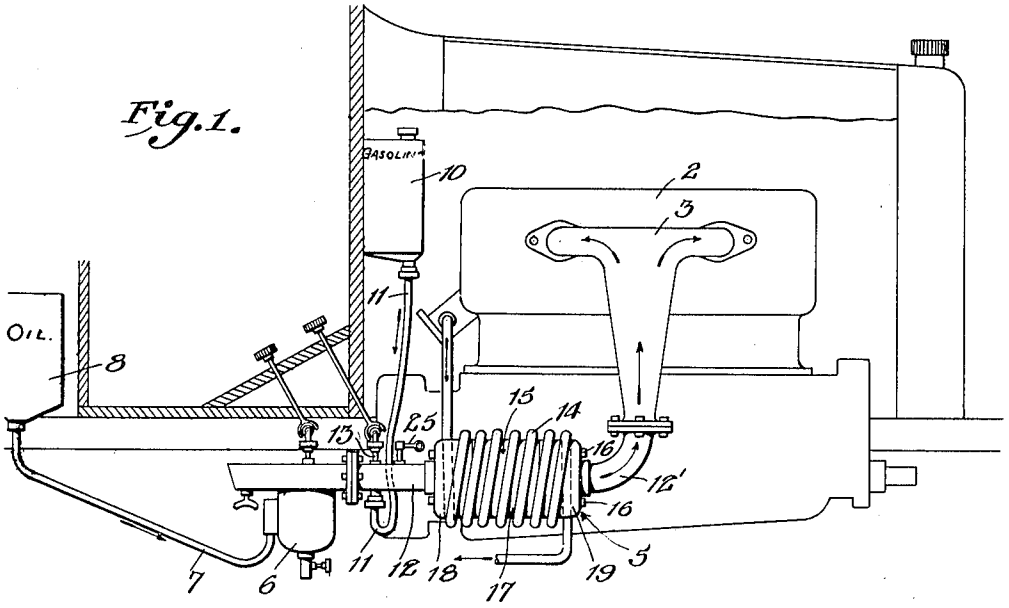


Fig. 2.

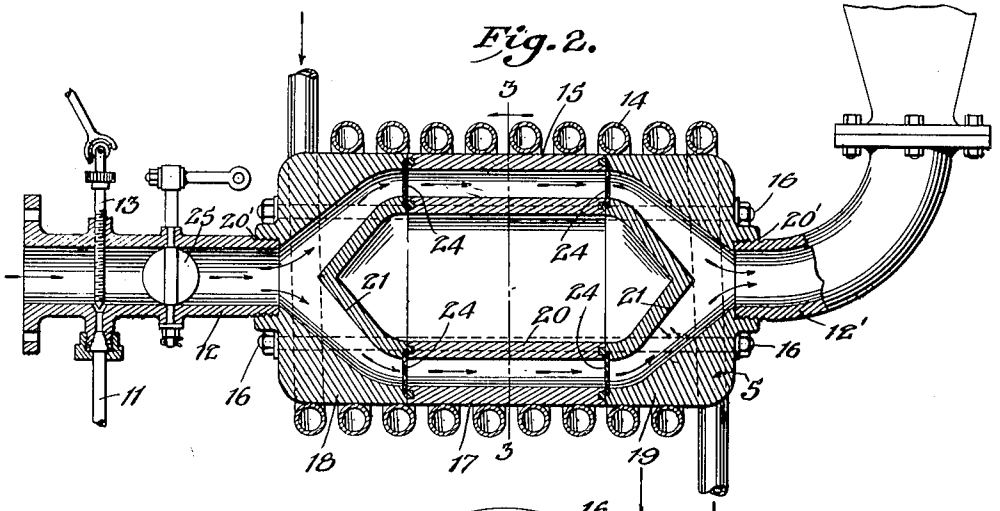
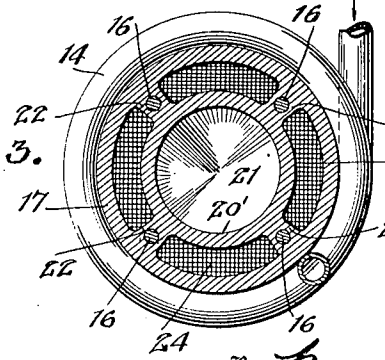


Fig. 3.



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FUEL-HEATER FOR INTERNAL-COMBUSTION ENGINES.

1,291,564. Specification of Letters Patent. Patented Jan. 14, 1919.

Application filed May 15, 1917. Serial No. 168,806.

To all whom it may concern:

Be it known that I, STEPHEN J. LAVENDER, a citizen of the United States, residing at Barnesville, in the county of Pike and State of Georgia, have invented certain new and useful Improvements in Fuel-Heaters for Internal-Combustion Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to internal combustion engines, and more particularly to means for providing for the vaporization of low grade fuel, such, for instance, as kerosene, so that the latter may be readily consumed in the operation of engines of this type.

It is one of the objects of the present invention to provide in combination with an internal combustion engine means for supplying fuel of different grades, for instance, gasolene and kerosene, derived from different sources, and to provide means for efficiently vaporizing the lower grade kerosene, so that it may be practicably used in internal combustion engines, and further to provide means whereby a primer supply of the higher grade fuel, as gasolene, may be introduced into the vapor generating apparatus at a suitable point in the supply or intake manifold of the motor.

One of the important objects of the present invention is to provide for the efficient vaporization of low grade fuel, and particularly to provide a device of such construction that the vapor from a carbureter in which the low grade fuel is vaporized is caused to pass through a retort which is adapted to be connected to a suitable source of heat, whereby the low grade vapor is heated so that its vaporization is increased and a better fuel is provided.

The invention consists in the combination with an internal combustion engine of two sources of supply of fuels of different grades, a carbureter for carbureting air with the low grade fuel, means for introducing between the carbureter and the motor a priming supply of the richer fuel, means for controlling the quantity of fuel flowing to the motor, and a retort for facilitating the vaporization of the mixture from the carbureter.

The invention also consists of an improved form of retort or attachment for intake manifolds of internal combustion engines in which the vaporous fuel passing from a carbureter is materially increased in temperature for the betterment of the condition of the fuel before it enters the combustion chamber of the engine.

With these and other objects in view one embodiment of the invention is illustrated in the accompanying drawings and described in the following specification, in which drawings:

Figure 1 is a diagrammatical elevational view of the apparatus in combination with a suitable form of motor.

Fig. 2 is a longitudinal sectional view, partly in elevation, of the improved retort.

Fig. 3 is a cross sectional view on line 3—3 of Fig. 2 through the retort.

In the illustrated embodiment of the invention 2 indicates a suitable type of motor to which is connected the manifold 3 to which is connected a vaporizer generally indicated at 5, and to be more fully described hereinafter, to which is connected at one end any suitable form of carbureter 6 which is connected by a pipe or tube 7 to a source of supply, as the tank 8, adapted to contain the low grade of fuel which is to be used in the operation of the motor. For the purpose of priming the engine for starting purposes or when it is desired to increase the power of the engine, there is provided a second source of supply, as 10, of richer fuel, such, for instance, as gasolene, which is connected by a tube 11 to the pipe 12 which leads from the carbureter to the retort, the flow of priming fluid through the supply pipe 11 being controlled by a suitable valve indicated at 13. The present invention particularly relates to the provision of means for increasing the vaporization of the low grade fuel, as kerosene, as it is derived from the carbureter 6 before it passes into the motor 2, and to achieve this I have provided an improved and simple form of retort which is adapted to be heated by heat derived from any suitable source and is shown herein as incorporating a coil 14 surrounding a casing 15 of the retort, the coil being connected to the exhaust pipe or apparatus of the motor so that the heat of the exhaust gases may be imparted to the retort, the coil 14 in this instance being formed of tubular material through which the products of combustion pass.

The device in its illustrated construction is shown as comprising in Fig. 2 the end section 12 which may be provided with a flange for ready connection to the carbureter 6 and is provided at its opposite end with a similar section 12′ for connection to the intake section of the manifold of the engine. While the retort 5 may be composed or erected as desired, in the present instance it has a central portion between the end sections 12 and 12′ including the outer shell portion 15 which if desired may be built up of sections as illustrated in Fig. 2 which are adapted to be secured together by longitudinally extending bolts or other fastening means 16 extending through the body of the several sections. A simple manner of constructing the retort chamber comprises providing a central cylindrical section 17 and a pair of complementary end sections 18 and 19 which may be substantially in duplicate form, each being threaded as at 20′ to receive the adjacent end sections 12 and 12′ respectively. Preferably the shell 15 of the retort is of considerably larger diameter than the diameter of the end sections 12 and 12′, and within the shell sections 17, 18 and 19 there is provided a core structure 20 which is centrally spaced within the interior surface of the shell 15 so that there is provided between the exterior surface of the core 20 and the inner surface of the shell 15 a passageway of elongated form which is substantially circular in cross section, the ends of the core 20 preferably being tapered, as indicated at 21, so that fuel vapor passing inwardly through the section 12 is diverted readily outwardly around the pointed adjacent end of the core and caused to be passed through the annular passageway about the core 20 and thence again gas is passed centrally into the discharge end of the retort at the end section 12′.

In the form of construction shown, the core 20 is built in sections respectively connected to the sections 17, 18 and 19 of the shell or body structure, and these sections are integrally formed with their respective core sections through means of suitable radially disposed ties or webs 22, as shown in Fig. 3, which may be provided if desired with apertures through which the fastening bolts or screws 16 may pass. Preferably the core 20 in the assembled sections is made hollow so that there is a dead-air space within the core, and when the apparatus is in use the heated products of combustion from the engine pass through the tubular coil 14 which surrounds the casing 15, and the heat of the passing gases is transmitted through the shell or casing portion 15 and the integral webs 22 to the core 20 within the retort, so that the latter becomes considerably heated and the heat is imparted therefrom to the fuel vapor passing from the carbureter into and through the retort.

Another feature of the present invention consists in providing means in the passageway of the retort for retarding some of the particles of vapor so as to prevent their being carried without being vaporized or gasified into the motor, and to accomplish this I prefer to employ a series of foraminous baffles in the form of screens 24 of suitable mesh and properties, these being disposed between the abutting sections 17, 18 and 19 forming the retort, and clamped therein when the sections are secured together. In effect as the larger particles of vapor pass into the retort chamber they impinge upon the foraminous baffles and are retained until they are vaporized, when they may pass freely through the retort and into the fuel intake.

While I have illustrated as a heating means a coil consisting of a pipe through which there is adapted to pass the heated gases exhausting from the engine, yet it is possible that any other suitable medium may be utilized to heat the retort.

To control the flow of gas, and consequently the speed of the motor, there may be provided at any suitable point a control throttle, preferably this being located as shown in Fig. 1, and in the section 12 at 25. This throttle 25 replaces the usual throttle at the vaporizer or carbureter 6, which may be removed or fastened in an open position.

In operation of the device when it is desired to start the motor, priming fluid from the gasolene tank may be admitted through the needle valve 13 into the pipe between the retort 5 and the carbureter 6, and after the engine has started runnning then the poorer fuel from the supply tank 8 may be admitted to the carbureter and the priming fuel shut off at the valve 13.

What is claimed as new is:

1. A retort for heating vaporous fuel for internal combustion engines, comprising a casing provided with a section for attachment to a source of vapor supply, means at the opposite end for attachment to an intake pipe, a section provided with an inner hollow central core forming a passageway surrounding the core, and a dead air space within the core, heating means adapted for connection to the exhaust means of the motor, and gauze members secured diametrically between the sections of the retort for arresting vapor particles.

2. A retort for heating vaporous fuel for internal combustion engines, comprising a casing provided with a section for attachment to a source of vapor supply, means at the opposite end for attachment to an intake pipe, a section provided with an inner central imperforate core forming a ring-like

passageway surrounding the core, heating means, and foraminous full annular diaphragms in the passageway about the core for intercepting vapor particles.

3. A retort for heating vaporous fuel derived from a carbureter and passing to a combustion engine comprising a double walled casing constructed of a plurality of separable sections, the central section being provided with a longitudinal passage-way of annular cross section, and the end sections being provided each with a passage-way divergent from its intake end to and registering with the passage through the central section, said end sections provided with conical deflectors which register with and close the inner wall of the central section so as to form a dead air space within the retort and annular screens secured between the meeting faces of the said sections.

In testimony whereof I affix my signature.

STEPHEN JUSTICE LAVENDER.