Nov. 8, 1932. J. C. RYAN ET AL 1,887,044

FUEL HEATER AND VAPORIZER

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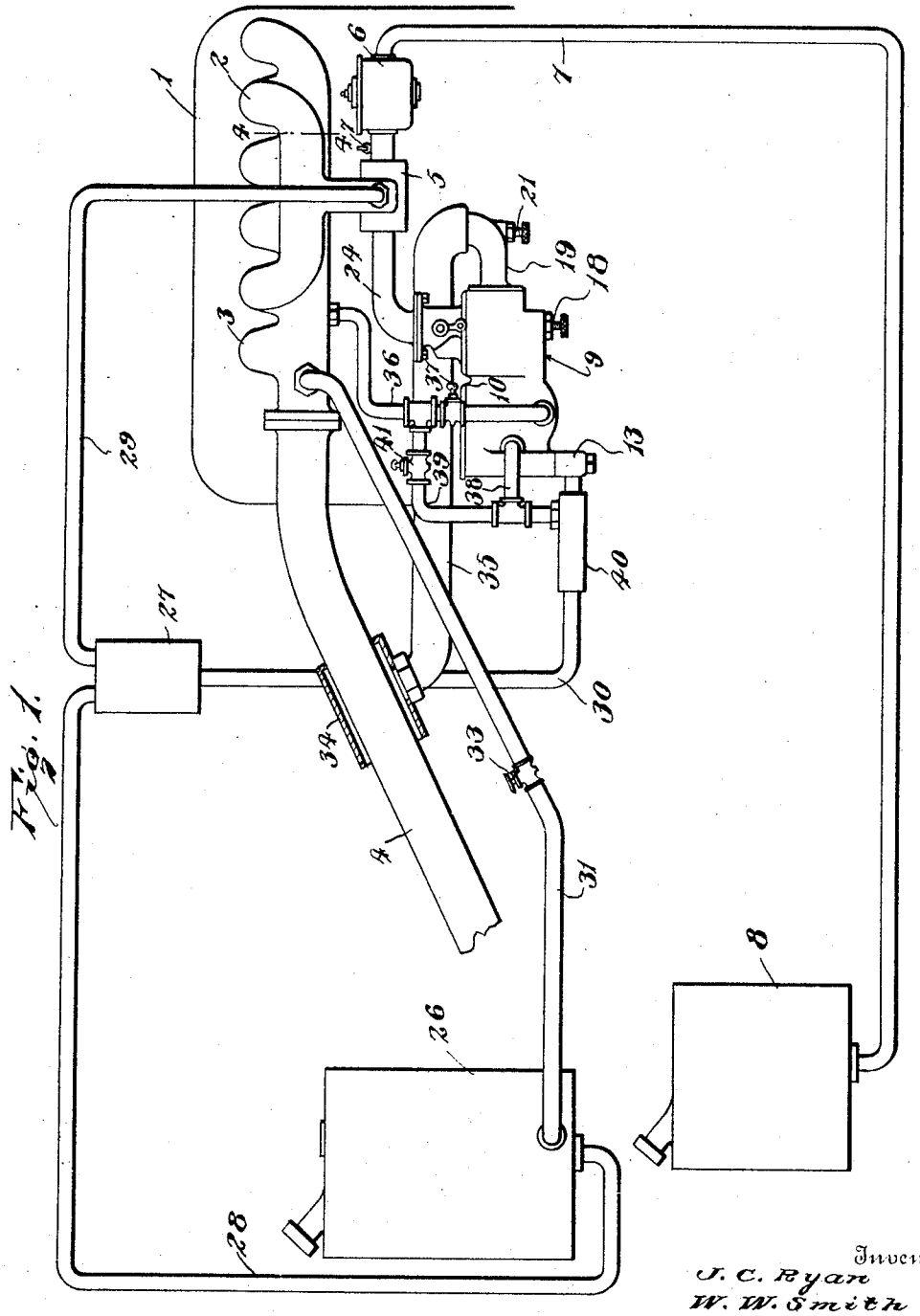


Fig. 1.

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Fig. 2.

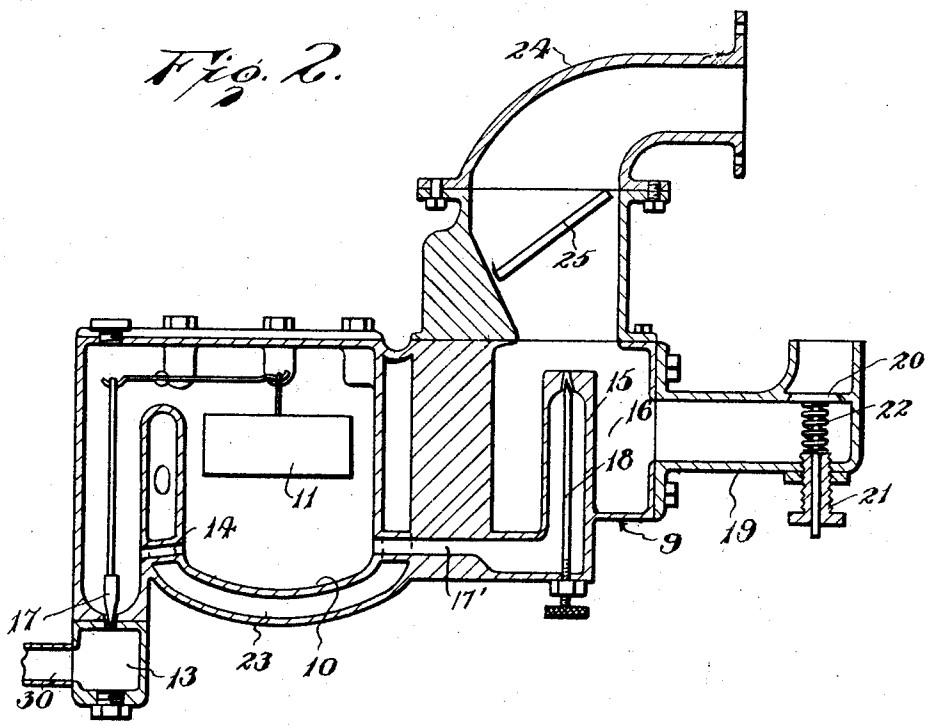


Fig. 3.

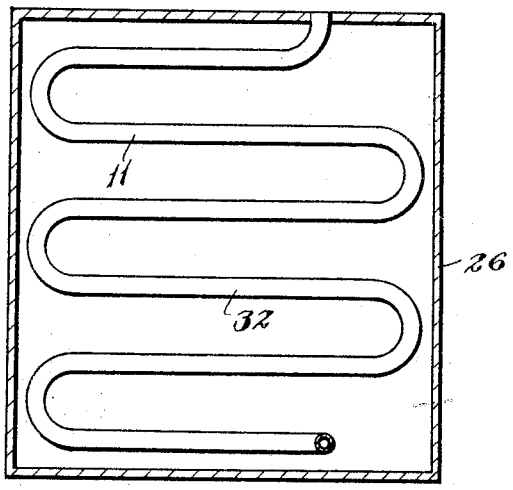
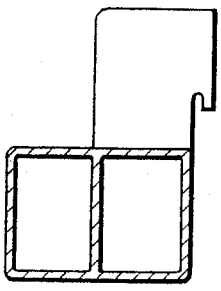


Fig. 4.



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UNITED STATES PATENT OFFICE

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FUEL HEATER AND VAPORIZER

Application filed December 3, 1929. Serial No. 411,365.

The present invention is directed to improvements in oil heaters and vaporizers for internal combustion engines.

The primary object of the invention is to provide a device of this character constructed and arranged in such a manner that fuel oil, such as deisilite, may be successfully used in lieu of high grade fuel such as gasoline.

Another object of the invention is to provide a device of this character so constructed that the oil will be effectively heated in order to vaporize the same for effective operation in the engine.

Another object of the invention is to provide a device of this kind wherein cheap grades of fuel oil may be successfully used in order to reduce the running expense of the engine without decreasing the efficiency thereof.

Another object of the invention is to provide means whereby the engine can be initially started with high grade fuel to heat the same, the supply being subsequently cut off and fuel oil of cheaper grade utilized.

Another object of the invention is to utilize the heat of the exhaust gases for heating the fuel and aid in the vaporization thereof, the construction being admirably adapted for use in cold weather.

Another object of the invention is to provide means whereby the air entering the auxiliary carbureter will be effectively heated.

With these and other objects in view, this invention resides in the novel features of construction, formation, combination and arrangement of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of the device, a part being shown in section.

Figure 2 is a detail sectional view through the auxiliary carbureter.

Figure 3 is a sectional view through the oil tank.

Figure 4 is a sectional view on the line 4—4 of Figure 1.

Referring to the drawings, 1 designates an internal combustion engine of any standard construction and associated therewith are the intake and exhaust manifolds 2 and 3, respectively. The intake and exhaust manifolds may be cast in one piece in order that the incoming fuel will be heated by the exhaust gases in the exhaust manifold. Leading from the exhaust manifold is the usual exhaust pipe 4. The intake manifold is connected to the intake head 5 which, in turn, is connected with the usual gasoline carbureter 6, there being a pipe 7 leading therefrom to the gasoline supply tank 8. The structure thus far described is conventional and it will, of course, be understood that the flow of gasoline from the tank 8 to the carbureter 6 may be by the vacuum tank or gravity system, as desired.

The auxiliary carbureter is indicated generally by the numeral 9, the bowl 10 thereof having a float 11 mounted therein for controlling the movement of the needle valve 17 which regulates the flow of fuel from the head 13 into the bowl through the duct 14. The spray nozzle 15 extends into the chamber 16 of the carbureter, fuel being conducted to the nozzle 15 through the passage 17′ which leads from the bowl 10. The flow of fuel to the nozzle may be regulated by the needle valve 18 capable of manual adjustment. An air inlet neck 19 extends laterally from the carbureter 9 and has mounted therein a spring pressed valve 20 adjustable to regulate the intake of air upon adjusting the plug 21, said plug obviously controlling the tension of the spring 22.

The bowl 10 is surrounded by a heating chamber 23, the purpose of which will be later explained. The chamber 16 communicates with the intake manifold 2 through the neck 24 and in which is mounted a conventional form of throttle valve 25.

In order to supply fuel oil to the carbureter 9, a tank 26 is provided and leading therefrom to a vacuum tank 27 is a pipe 28, suction in the tank 27 being induced through the pipe 29 in connection with the intake manifold 2. The fuel drawn into the vacuum tank will feed through the pipe 30 to the head 13 and from thence into the bowl 10. The flow of fuel will obviously be controlled by the float 11 and needle valve 17.

Leading from the exhaust manifold 3 to the tank 26 is a pipe 31 which connects with a heating coil 32 located in the tank so that the hot gases passing through the coil will heat the oil contained in the tank. The flow of exhaust gases through the pipe 31 to the coil 32 can be regulated by operating the valve 33.

Surrounding the exhaust pipe 4 is a drum 34 and leading from said drum to the neck 19 is a tube 35. Obviously, air entering the open end of the drum will be heated by the exhaust pipe 4 so that when it enters the neck 19 it will be thoroughly heated.

A pipe assembly 36 leads from the exhaust manifold 3 to the auxiliary carbureter 9 and discharges hot gases into the chamber 23, there being a valve 37 in said assembly to regulate or cut off the flow of gases when desired. The hot gases entering the chamber 23 are discharged through the pipe 38 which leads to a pipe assembly 39 leading from the pipe assembly 36. The pipe assembly 39 connects with a drum 40 surrounding the pipe 30 at a point near the head 13. A valve 41 is mounted in the assembly 39 so that the flow of gases therethrough may be regulated. Obviously, the valve 41 may be closed and the hot gases from the chamber 23 will enter the drum 40 or, if desired, the valves 41 and 37 may both be opened so that the hot gases from the chamber 23 as well as from the pipe assembly 39 will enter the drum 40.

The engine is initially started by fuel from the usual carbureter 6. After the engine has warmed up sufficiently, the carbureter 6 may be cut off, whereupon the fuel from the tank 27 will pass through the pipe 30 into the auxiliary carbureter 9 and will be heated as it passes through the drum 40. Since the incoming fuel is heated and the air warmed when passing through the drum 34, the fuel will be properly heated before entering the intake manifold and will be in a vaporized condition. Owing to the presence of the pipe assemblies 36 and 39, the fuel in the bowl will be thoroughly heated before being conducted to the nozzle 15. The fuel will be sprayed from the nozzle into the neck 24 so that the mixture of air from the chamber 16 will enter the intake manifold in a highly vaporized condition. Since the oil is heated before entering the auxiliary carbureter 9 and is further heated in the bowl thereof, it will be thoroughly vaporized for effectively operating the engine.

From the foregoing, it is thought that the operation, and many advantages of the herein described invention will be apparent to those skilled in the art without further description and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What is claimed is:

The combination with an internal combustion engine, of a carbureter therefor, said carbureter having a chamber surrounding the bowl thereof, a fuel supply pipe for the bowl, means for conducting heated air to the mixing chamber of the carbureter, a drum surrounding the supply pipe, means for conducting exhaust gases from the exhaust manifold of the engine to the drum, and from the exhaust manifold to the chamber, and means for controlling the passage of exhaust gases to the drum and said chamber.

In testimony whereof they affix their signatures.

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