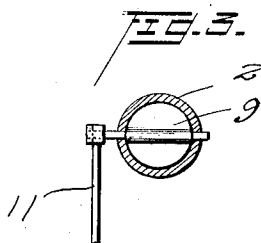
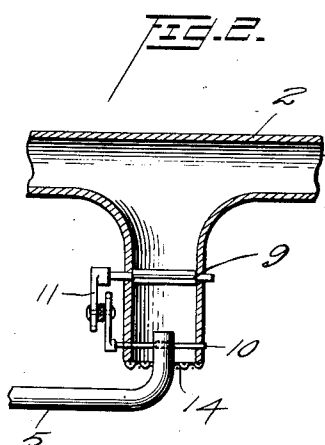
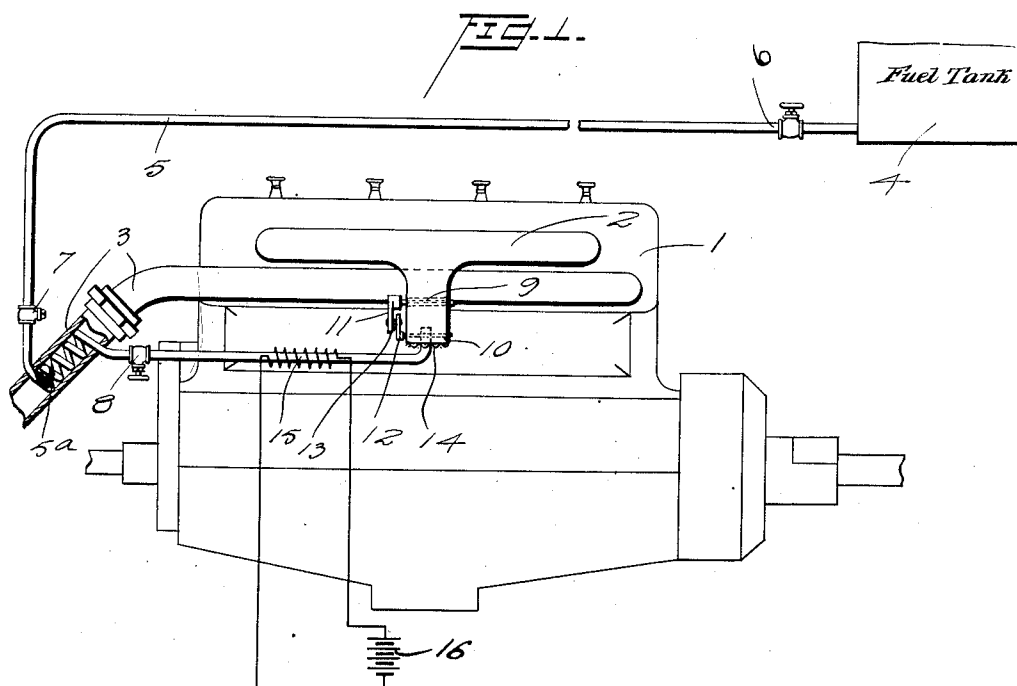


G. A. SMITH.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED FEB. 10, 1920.

1,361,503.

Patented Dec. 7, 1920.



Witness

Harold Starnes

Inventor

Grover A. Smith

By

Robert H. Young

Attorney

UNITED STATES PATENT OFFICE.

GROVER A. SMITH, OF WEST SALEM, ILLINOIS.

INTERNAL-COMBUSTION ENGINE.

1,361,503.

Specification of Letters Patent.

Patented Dec. 7, 1920.

Application filed February 10, 1920. Serial No. 357,667.

To all whom it may concern:

Be it known that I, GROVER A. SMITH, citizen of the United States of America, residing at West Salem, in the county of Edward and State of Illinois, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to improvements in internal combustion engines and more particularly to that type of engines which have a vaporizer in the gasolene feed line to vaporize the gasolene, thereby doing away with the use of a carbureter.

This application is a refiling of application filed June 30, 1917, Serial No. 177,882.

An object of this invention is to provide an internal combustion engine with vaporizing means whereby the carbureter may be dispensed with.

Another object is to provide means whereby the initial charge of gasolene may be vaporized, and later using the excess heat from the exhaust to vaporize the gasolene, thereby doing away with the necessity of a carbureter.

Other objects will become apparent as the description proceeds.

In the accompanying drawings which form a part of my specification:

Figure 1 is a side elevation of an internal combustion engine, showing my improved vaporizer inserted in the gasolene system, and the supplemental vaporizer around the gasolene feed pipe.

Fig. 2 is a sectional view of the intake manifold of an internal combustion engine showing the valves in the said manifold and feed pipe, being coupled together, and

Fig. 3 is a top plan view of the valve in the intake manifold, showing it in closed position.

The engine 1 is of the usual type of four cylinder engine construction and has the usual intake manifold 2 and exhaust line 3.

A fuel tank 4 is provided and a lead pipe 5 conducts the gasolene into the intake manifold 2. Within the lead or fuel pipe 5 is a needle valve 6 which is placed adjacent the fuel tank 4. A portion of the pipe 5 is coiled spirally within the exhaust manifold 3, as at 5^a, and has a check valve 7 therein at a point near where said pipe enters the exhaust manifold and a needle valve 8 at a point near where the said pipe 5 has its exit from the exhaust manifold.

A valve 9 is inserted in the intake manifold 2 which regulates the mixture which passes to the engine. At the end of the lead pipe 5, which terminates in the end of the intake manifold is placed a valve 10. Arms 11 and 12 respectively are connected with the valves 9 and 10 and are joined together by operating rod 13 for simultaneously regulating the amount of vapor and air admitted to the engine. Wire netting 14 of any suitable kind is placed over the end of the intake manifold to prevent any foreign substance from clogging it up or getting dirt into the cylinders.

An electric heating coil 15 is placed around the feed pipe 5 between the needle valve 8 and the end of the pipe for heating the initial charge of gasolene, thereby vaporizing it and starting the engine. Any suitable battery 16 may be placed in circuit with the heating coil 15 for heating the same.

It will be seen that the electric current is turned on and the heating coil heated, thereby vaporizing the charge of gasolene between the valve 8 and the end of the pipe located in the intake manifold, thus causing the engine to start upon being cranked. After the engine has run for a few seconds, the heat from the exhaust will vaporize the gasolene within the coil of pipe 5^a, located in the exhaust pipe, and cause the vapor to be blown into the intake manifold under pressure.

Valves 9 and 10 arranged respectively within the intake manifold and end of the gasolene feed line are connected together by the operating rod 13 and are moved simultaneously together, thereby regulating the mixture of vaporized gasolene and air, consequently doing away with the carbureter which so often cause so much motor trouble.

From the foregoing description it will be readily understood that the improved arrangement of having two valves in the intake manifold and the end of the gasolene feed pipe, which are operated together will make it unnecessary to stop a machine and get out to adjust the carbureter for every different elevation which one may travel in. The adjustment may be made more easily, quickly and with less inconvenience than with any other type of vaporizing means of which I know.

It will be understood that minor changes

in detail of construction may be resorted to without departing from the spirit of the invention.

What I claim is:

- 5 A vaporizer for internal combustion engines, comprising a fuel feed line, a portion of said line passing through the engine exhaust manifold, wherein the fuel is vaporized and superheated, a check valve in said
10 line intermediate of the fuel tank and the portion thereof in the exhaust manifold, a needle valve in said line between the dis-

charge end of the line and the exhaust manifold adjacent to the exhaust manifold, whereby the portion of the line between said 15 last mentioned valve and the intake manifold forms a reservoir of superheated and expended vapor for the initial charge of the engine, and a throttle valve in said intake manifold. 20

In testimony whereof I affix my signature.

GROVER A. SMITH.