D. J. ANGUS.

CARBURETER.

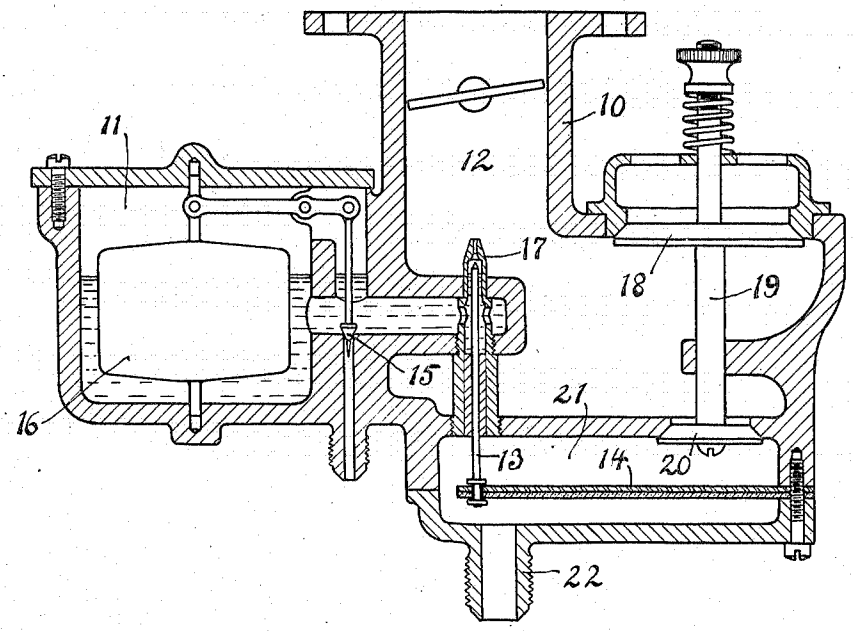
APPLICATION FILED AUG. 3, 1916.

1,303,229.

Patented May 13, 1919.

3 SHEETS—SHEET 1.

Fig. 1.



INVENTOR

Donald J. Angus

BY

Bradford & Doolittle

ATTORNEYS.

D. J. ANGUS.

CARBURETER.

APPLICATION FILED AUG. 3, 1916.

1,303,229.

Patented May 13, 1919.

3 SHEETS—SHEET 2.

Fig. 2.

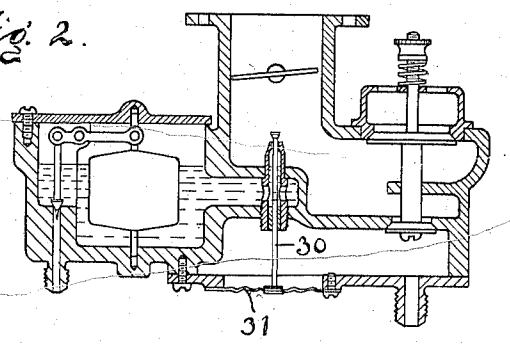
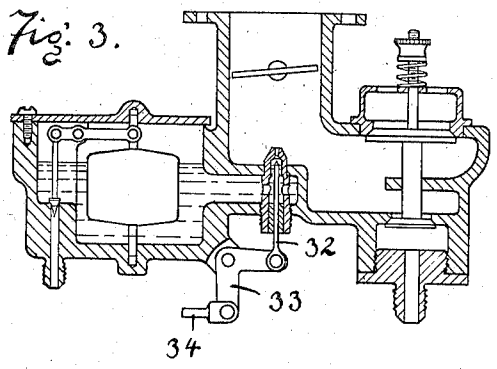


Fig. 3.



INVENTOR

Donald J. Angus,

BY

Bradford & Doolittle,

ATTORNEYS.

D. J. ANGUS.

CARBURETER.

APPLICATION FILED AUG. 3, 1916.

1,303,229.

Patented May 13, 1919.

3 SHEETS—SHEET 3.

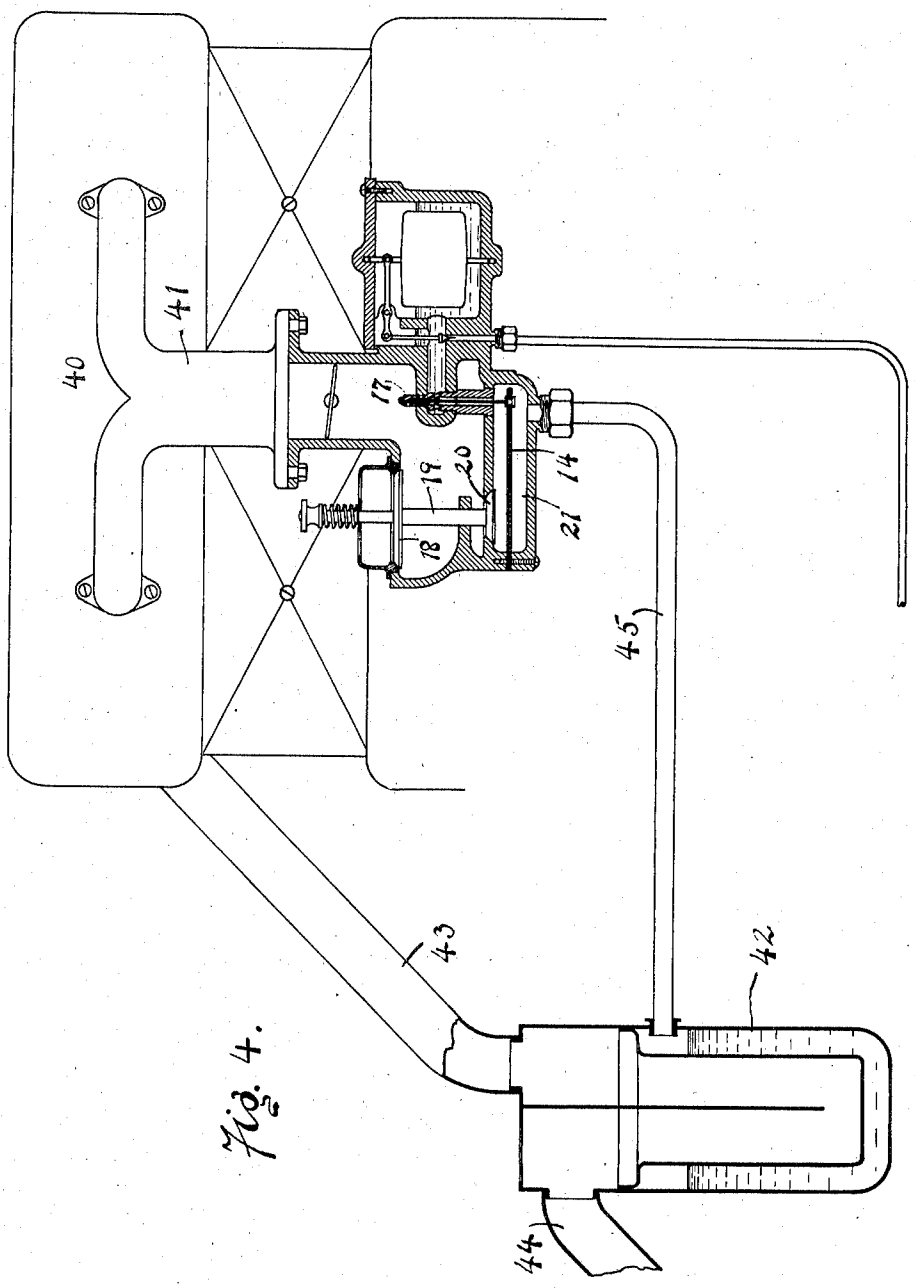


Fig. 4.

INVENTOR

Donald J. Angus,

BY

Bradford & Doolittle,

ATTORNEYS.

UNITED STATES PATENT OFFICE.

DONALD J. ANGUS, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO JOHN W. ESTERLINE AND DONALD J. ANGUS, DOING BUSINESS UNDER THE NAME OF ESTERLINE & ANGUS, OF INDIANAPOLIS, INDIANA, A PARTNERSHIP.

CARBURETER.

1,303,229. Specification of Letters Patent. Patented May 13, 1919.

Application filed August 3, 1916. Serial No. 112,998.

To all whom it may concern:

Be it known that I, DONALD J. ANGUS, 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 Carbureters, of which the following is a specification.

In the operation of internal combustion engines on low-grade fuels, such as low-grade oils, it is common practice to apply heat to the fuel for the purpose of vaporizing it, or to aid in its vaporization. An apparatus designed for this purpose forms the subject matter of my application No. 103,264, filed June 12, 1916, this being referred to merely as a type of apparatus designed for this purpose, and not to, in any way, have it understood as limiting my present invention to the construction of apparatus there shown.

In the use of such type of apparatus, it is necessary to provide some means for starting the engine. I have found, in practice, that volatile fuel, such as gasolene, may be used to advantage, and my present invention relates to a method and means for employing gasolene, or other volatile fuels, for starting the engine and operating it until a supply of heated or vaporized fuel has been generated sufficient to supply the requirements of the engine, and to operate or aid in operating the engine whenever the heated or atomized fuel, from any cause, becomes deficient to supply the requirements of the engine; and further, to provide means whereby, when the supply of the heated or atomized fuel reaches a volume sufficient to supply the engine, the volatile fuel may be automatically cut off, and again automatically supplied whenever the supply of heated or atomized fuel becomes deficient, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts,

Figure 1 is a sectional view through a carbureter of special construction designed to use a heated fuel, in the form of a vapor or liquid, its purpose being to supply the volatile fuel for starting the engine, and embody means for shutting off the supply when the heated fuel is supplied in sufficient volume to operate the engine.

Fig. 2 a similar view illustrating a modified form,

Fig. 3 another similar view illustrating another modified form, and

Fig. 4 a view illustrating the form of apparatus as shown in Fig. 1 applied to an engine with generator or vaporizer attached.

In said drawings, the portions marked 10 represent the casing of the carbureter, 11 the gasolene chamber, 12 the mixing chamber, 13 a valve for controlling the flow of the gasolene to the mixing chamber, 14 a thermostat for operating said valve, 40 the engine, 41 the intake manifold, 42 the vaporizer, and 43 the exhaust pipe.

A general description of the apparatus will describe its construction and define the invention, the structure of the parts themselves being largely of common and well known types.

Referring to the form shown in Fig. 1. The supply of gasolene in chamber 11 is regulated by a valve 15 controlled by a float 16 in the usual and well known manner. The atomizer nozzle 17 projects into the mixing chamber 12 and its outlet is controlled by a valve 13. The air inlet is controlled by valve 18 on a stem 19, which also carries a valve 20 controlling the port between the mixing chamber and the fuel chamber 21, which is adapted to be connected with the heated fuel supply by means of a screw-threaded neck piece 22 adapted to be connected with the heated fuel supply pipe 45.

The valve 13 is mounted on a support 14 of a material on its lower side adapted to be readily expanded by the heat of the fuel, causing the support to turn upwardly and seat the valve 13, and shut off the supply of volatile fuel.

It will thus be seen that the chamber 21 is connected to the heated fuel supply, as by pipe 45. The engine is started in the usual manner by means of the volatile fuel in chamber 11. As soon as sufficient heated fuel is supplied to heat the support 14, valve 13 will be closed, the supply of volatile fuel shut off and the engine will draw its supply of fuel from chamber 21, the suction causing valves 18 and 20 to intermit-

tently open for admitting the air and the fuel to said mixing chamber. Should the supply of heated fuel become deficient, support 14 will cool and the cooling of said support will cause valve 13 to fall and allow volatile fuel to be supplied in the regular way, or until sufficient heated fuel is available to again supply the needs of the engine. Heat from the quantity of fuel then coming into the chamber 21 will automatically close valve 13, and the engine will run on the fuel coming from the heater.

The structure shown in Fig. 2 is substantially the same as that shown in Fig. 1, except that the valve 30 for controlling the flow of the volatile fuel is operated by a flexible diaphragm 31, actuated by the pressure of the heated fuel; otherwise the operation is the same as that of the construction illustrated in Fig. 1.

In the construction shown in Fig. 3, the valve 32 for controlling the flow of volatile fuel to the mixing chamber is connected through a bell-crank lever 33 and connecting rod 34 to an operating device (not shown) on the dash or convenient to the driver.

Fig. 4, as will be readily seen, shows an apparatus wherein the vaporizer or generator forming the subject matter of my application above mentioned is combined with the particular carbureter shown in Fig. 1 to supply fuel to the engine. The heat is supplied to the vaporizer 42 by exhaust gases coming through pipe 43 and passing out by pipe 44 while the vapor or heated fuel passes to chamber 21 by the pipe 45.

It will be understood, however, that the particular type of heater, or vaporizer, or carbureter, is not essential, but that my invention contemplates any form of either that will provide means whereby a volatile fuel is supplied by the absence, or deficiency in supply, of heated fuel, and cut off by a sufficiency in the supply of said heated fuel.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is:

1. A carbureter for internal combustion engines comprising a casing providing a mixing chamber, a liquid fuel chamber, and a chamber adapted to receive heated gaseous fuel, means for projecting liquid fuel into the mixing chamber in the form of spray, a thermostatic control for said spraying means located in the chamber for the heated gaseous fuel, a valve controlling the admission of air into the mixing chamber and operable through the suction of the engine, and a valve controlling the admission of the heated gaseous fuel into the mixing chamber, said last named valve connected to and operated by the air intake controlling valve, substantially as set forth.

2. The combination with an internal combustion engine of a carbureter therefor comprising a casing providing a mixing chamber, a liquid fuel chamber, and a chamber adapted to receive heated gaseous fuel, means for projecting liquid fuel into the mixing chamber in the form of spray, a thermostatic control therefor located in the chamber for receiving the heated gaseous fuel, a common control for regulating the admission of air and the heated gaseous fuel into the mixing chamber, a fuel vaporizer connected to receive the heated exhaust gases from the engine, and a communication between said vaporizer and the chamber for heated gases in the casing, substantially as set forth.

In witness whereof I have hereunto set my hand and seal at Indianapolis, Indiana, this 24th day of July, A. D. nineteen hundred and sixteen.

DONALD J. ANGUS. [L. S.]

Witness:
A. C. RICE.