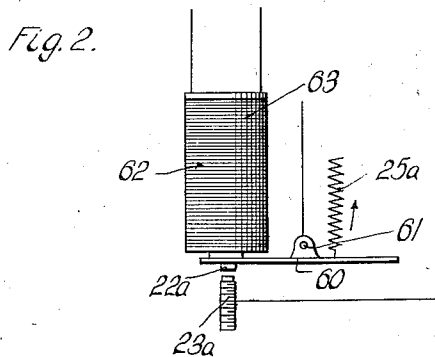
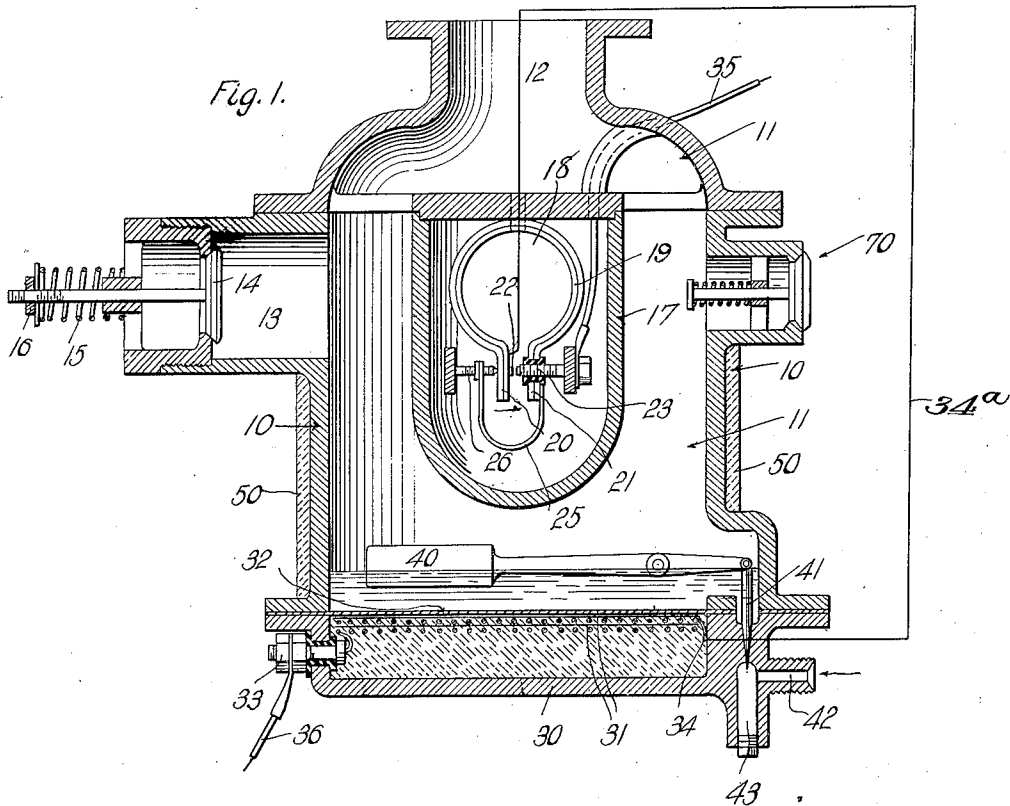


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CARBURETER.

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1,065,370.

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CARBURETER.

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To all whom it may concern:

Be it known that we, FRED JOHNSTON and ORLANDO E. KELLUM, both citizens of the United States, residing at Los Angeles and Longbeach, respectively, both in the county of Los Angeles, State of California, have invented new and useful Improvements in Carbureters, of which the following is a specification:

10 This invention relates to carbureters for use in combination with internal combustion engines; and has to do more particularly with a carbureter in which the liquid fuel is heated so that it may more readily vaporize, thus providing for the use of heavier liquid fuel than is ordinarily the case, and providing for efficient and quick starting when the liquid fuel is cold.

Heretofore great difficulty has been experienced in the use of petroleum distillates heavier than gasoline; largely because of difficulty in obtaining free vaporization of the liquid. We propose to suitably heat the liquid fuel to a temperature depending upon the temperature at which free vaporization takes place, so that a sufficient amount of vapor is obtained to form an explosive mixture with the air passing through the carbureter. Preferably, the heating arrangement is controlled by a thermostat which will maintain the temperature at an even degree; but in some aspects our invention will consist in the combination of an electrical heating device with a carbureter as will be hereinafter set forth.

We have shown in the accompanying drawing the preferred form or forms of our device, typifying thereby other equivalent arrangements which may be used without departing from the scope of our invention.

40 In these drawings Figure 1 is a vertical section of our complete improved carbureter. Fig. 2 is a diagrammatic view illustrating a modified form of thermostatic arrangement.

In the drawings 10 designates the body of a carbureter containing the liquid fuel chamber. This liquid fuel chamber may be of any desired size and configuration, suitable for the apparatus to which it is designed to feed explosive mixture. Above the body 10 there is fitted the cap piece 11 with outlet 12, to which outlet the manifold or intake pipe of the engine will connect.

The air inlet 13 to the liquid fuel chamber 55 is preferably controlled by a suitable valve 14 opening inwardly and opposed in its movement by a spring 15 whose pressure may be adjusted by means of nut 16. This construction is of the ordinary and usual design; and may be varied to suit individual requirements. In fact, we have shown in our carbureter a means for merely passing air through the liquid fuel chamber; but any other common and well known means of passing the air through or over the liquid surface or around a nozzle through which the liquid sprays, may be had. Centrally located within the fuel chamber we have placed a thermostat chamber 17. This thermostat chamber is covered by a portion of cap piece 11 and is arranged to contain the thermostatic mechanism 18, somewhat as illustrated. The thermostatic mechanism may consist of a differentially expanding metallic ring 19 whose ends 20 and 21 carry contacts 22 and 23 respectively. Contact 23 is insulated and is adjustable with relation to contact 22 so that the movement of the thermostat required to close the circuit between the contacts may be varied. A suitable spring 25 is provided and a pressure screw 26 adjustably fixed on the end of the spring is pressed against the end 20 of the thermostat spring, to press the end 20 toward the end 21 and to press the contacts 22 and 23 into electrical engagement. The pressure of the spring 25 on the thermostat may be adjusted by adjustment of screw 26; and the gap between the two contacts 22 and 23 may also be adjusted; and, in this manner, the temperature at which the thermostat acts to close or open the contact switch may be adjusted to a nicety. Normally, when the carbureter is cold, the thermostat will be contracted and the contacts 22 and 23 in engagement with each other. They will remain in engagement with each other until the thermostat sufficiently expands to carry them apart. This will break the electrical circuit; and the arrangement is so made that the circuit will be thus broken when the temperature of the thermostat reaches the point at which it is desired to keep the whole carbureter and the liquid fuel therein. Immediately below the liquid fuel chamber there is arranged the casing 30 which contains the heating element or elements 31.

These heating elements are preferably arranged flatly and as close as possible to the heat conducting sheet 32 (preferably copper) which separates the liquid fuel chamber from the chamber in casing 30 in which the heating elements are contained. The heating elements may be laid in asbestos cement or other heat insulating material, and be separated by mica or other insulating material from each other and from the copper plate 32. An insulating binding post 33 connects with one end of the heating element while the other end is grounded at 34 to the body of the carbureter. This grounded end at 34 will connect with the grounded contact 22 of the thermostat through the body of the carbureter, or by suitable wire connection shown diagrammatically at 34^a in Fig. 1. A suitable wire connection 35 connects with contact 23 of the thermostat, while a suitable wire connection 36 connects with binding post 33. Any sufficient source of electrical current may be utilized, to which wires 35 and 36 are connected.

The liquid fuel chamber is provided with a pivoted float which controls liquid fuel inlet valve 41. This valve may be arranged in any of the manners common to the art, the liquid fuel inlet being at 42 and there being provided a well 43 below the valve opening top for catching any sediment which might otherwise pass into the carbureter.

The carbureter may be supplied with fuel, and being cold, as soon as the electrical current is supplied to wires 35 and 36, the heating elements start to increase the temperature of the fuel and of the carbureter generally. As soon as the fuel has been heated to a sufficient temperature to vaporize and for the heat being thus distributed throughout the chamber, the thermostatic arrangement 18 becomes heated and will open the circuit between contacts 22 and 23. This immediately stops the action of the heating element until the temperature falls sufficiently to cause the closing of the circuit between the contacts 22 and 23. In this manner the temperature of the carbureter is kept fairly constant at a point where the liquid fuel will freely vaporize. The vapor arising from the liquid fuel is carried and mixed with the air passing through inlet 13 and through outlet 12.

We may use fuels of extremely heavy natures with this our improved device for the reason that it is only necessary to heat such fuels to a sufficient temperature to produce their vaporization. Heretofore, gasoline and similar like products have only been used in carbureters for the reason they alone would freely vaporize at ordinary temperatures. But even such light fuels have been found to vaporize with difficulty when first starting an engine when the temperature is low; and our device is not only useful for

utilization of heavy fuel oils; but it is useful in initially heating a carbureter for starting with the lighter fuels, the current being turned off from the carbureter as soon as it is warmed up and started.

In Fig. 2 we have shown a modified form of the thermostatic device illustrating this form as typical of the departures we may make from the specific form shown in Fig. 1. In the form shown in Fig. 2 there is an armature 60 pivoted at 61 and pulled in the direction indicated by the arrow by a spring 25^a. Contact 22^a is carried by the armature and the contact 23^a is adjustable to engage with the contact 22^a. A suitable magnet 62 attracts the armature to open the circuit between contacts 22^a and 23^a. And this magnet is wound with wire 63 of such material as changes its resistance greatly upon the change in temperature. As the temperature rises, the resistance of the wire 63 increases and the magnetic traction due to the current flowing in the wire also decreases. The spring 25^a can be arranged in its amount of tension to pull the armature away from the magnet at any suitable temperature, and to close the circuit between contacts 22^a and 23^a.

In Fig. 1 we have shown a small safety valve 70 which may be used if desired. This valve will allow escape of vapors which may be generated from highly volatile fuels, such as gasoline, when the engine has been suddenly stopped and the carbureter is still warm. In heavier fuels, such as kerosene, for which this device is particularly designed, there may be no use for this valve. Our carbureter is of particularly great utility for kerosene.

Having described our invention, we claim:

1. A carbureter, comprising a chamber for containing liquid fuel, a heat conducting bottom for said chamber, an electrical heating element immediately beneath the heat conducting bottom, a float controlled valve for maintaining a constant amount of liquid fuel in the lower part of the chamber, a thermostat chamber situated entirely within the liquid fuel chamber above the liquid level therein, a thermostat in the chamber, and a switch operated by the thermostat and electrically connected with the electrical heating element to control the supply of current thereto.
2. A carbureter, comprising a liquid fuel chamber, an electric heating element in proximity thereto, means for introducing liquid fuel to said chamber, outlet means for vapors from the liquid fuel, a thermostat within said chamber, and a switch operated by the thermostat and electrically connected to the heating element to control supply of current thereto.
3. A carbureter, comprising a liquid fuel chamber, means for passing air through the chamber over the fuel therein, a heat con-

ducting bottom for the chamber, an electric heating element below the heat conducting bottom, a thermostat chamber within the fuel chamber, a thermostat therein, an electric switch operated by the thermostat, and
5 an electrical circuit including the heating element and the switch in series.

In witness that we claim the foregoing

we have hereunto subscribed our names this 2nd day of December 1912.

FRED JOHNSTON.
ORLANDO E. KELLUM.

Witnesses:

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