

Nov. 27, 1951

A. KIMMELL

2,576,401

ELECTRIC CARBURETOR HEATER

Filed Sept. 8, 1949

2 SHEETS—SHEET 1

Fig. 1.

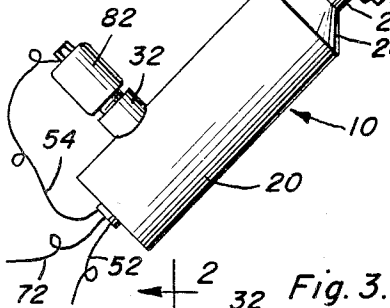
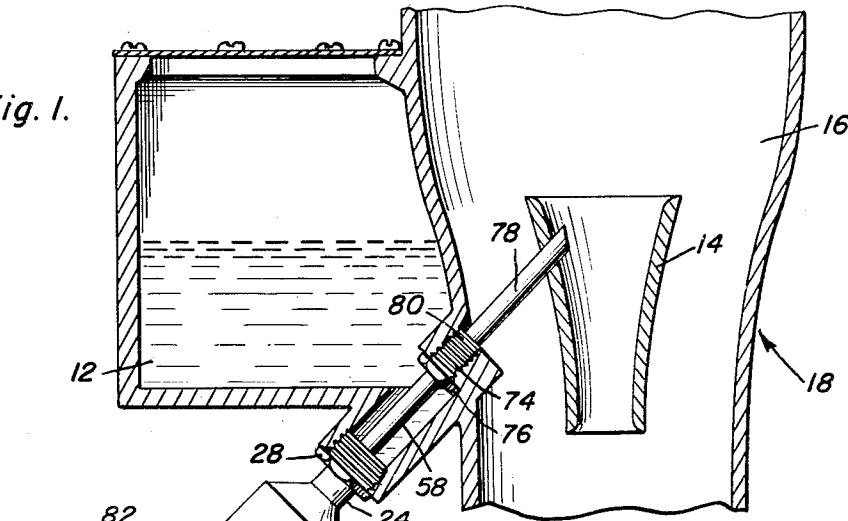
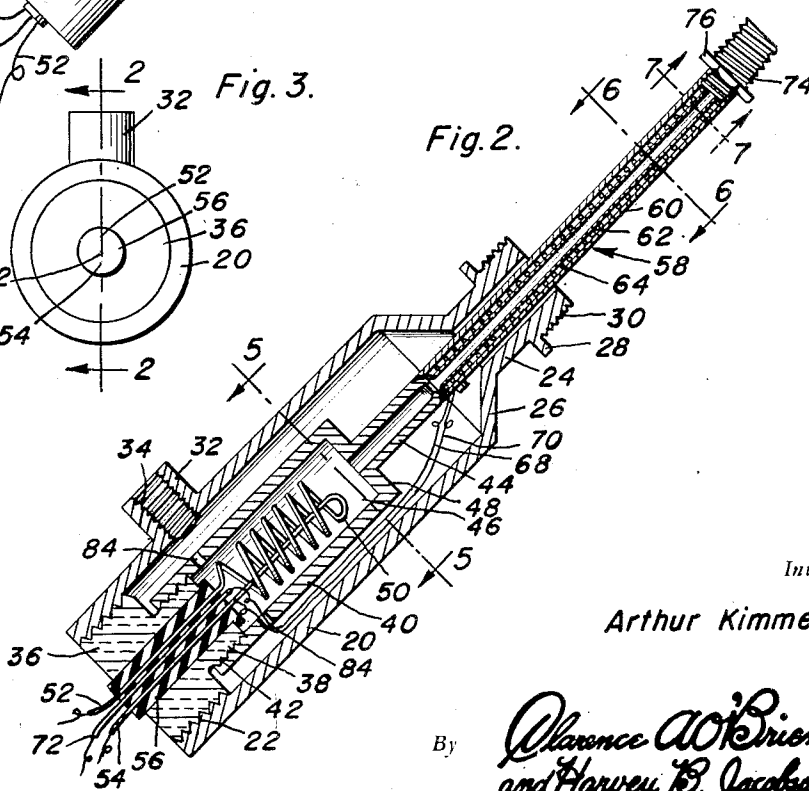


Fig. 2.



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2 SHEETS—SHEET 2

Fig. 4.

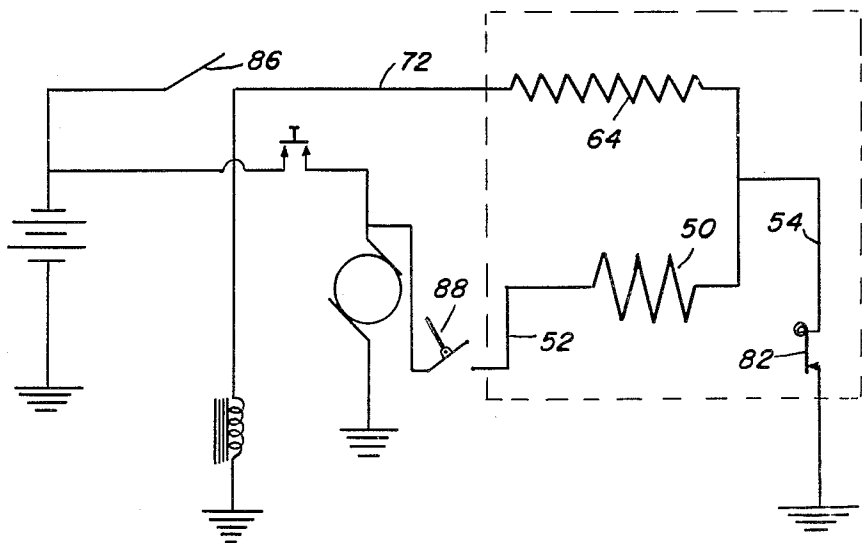


Fig. 5.

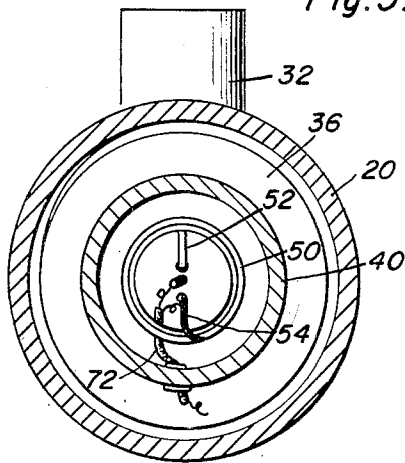


Fig. 6.

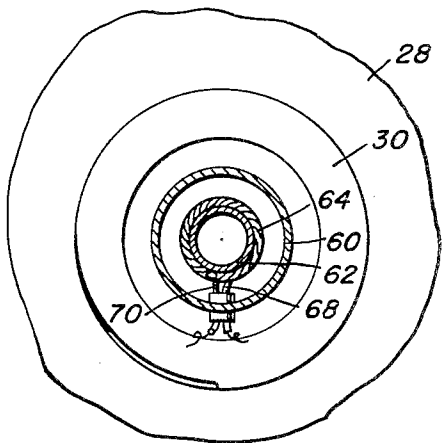
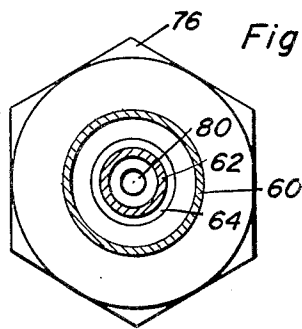


Fig. 7.



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ELECTRIC CARBURETOR HEATER

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3 Claims. (Cl. 219—38)

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This invention relates to fuel heating and vaporizing devices, and more particularly to a carburetor structure for heating and vaporizing liquid fuel for use in internal combustion engines.

An object of the invention is to raise the temperature of liquid fuel for an internal combustion engine before it is discharged into the air stream.

A further object of this device is to eliminate the necessity for a heater manifold, which seriously cuts down the volumetric efficiency of an internal combustion engine and increases the tendency to "knock," or pre-ignite, upon use with fuels of lower octane rating.

A further object of this invention is to eliminate the necessity to choke the internal combustion engine on starting.

A yet further object of the invention is to provide an attachment for an internal combustion engine carburetor which will heat the liquid fuel for use in the engine before its delivery to the air stream.

These, together with various additional objects which will become apparent as the following description proceeds, are attained by this carburetor attachment, a preferred embodiment which has been illustrated, by way of example only, in the drawings, wherein:

Figure 1 is a elevational view showing how the attachment comprising the present invention is secured to a carburetor, parts of the carburetor thereof being shown in section for greater detail;

Figure 2 is a vertical sectional view of the carburetor attachment, taken along line 2—2 in Figure 3;

Figure 3 is an end elevational view of the invention;

Figure 4 is a schematic diagram of the wiring circuits of the present invention;

Figure 5 is a sectional view taken along line 5—5 of Figure 2;

Figure 6 is another vertical sectional view, but taken along line 6—6 in Figure 2; and,

Figure 7 is a vertical sectional view of the delivery means comprising one element of the present invention, as taken along lines 7—7 in Figure 2.

With continued reference to the accompanying drawings, wherein like characters designate similar parts throughout the various views, attention is first directed to Figures 1 and 2 wherein is shown in greatest detail the structure comprising the present invention. Reference numeral 10 is used to generally designate the carburetor at-

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tachment comprising the present invention. Attachment 10 comprises a liquid fuel heating device which is secured to, and in communication with the bowl or flow chamber 12 and the Venturi orifice 14 within the throat 16 of a carburetor generally designated by reference numeral 18.

The attachment comprises an outer container or cylinder 20 having an end portion 22 provided with internal threads. The other end of the first and outer container 20 has a reduced portion 24 connected by outer walls 26 to the main portion of the container 20. The reduced portion 24 is provided with an annular flange 28 and a externally or male threaded portion 30. Outwardly extending from the walls 26 of the cylinder is a port 32 having internal or female threaded threads 34.

An apertured insert 36 is attached in threaded engagement with the threaded end 22 of the cylinder 20. The insert 36 is provided with a threaded portion 38 of reduced diameter.

An inner percolator container or cylinder 40 has its end 42 in threaded engagement with the reduced threaded portion 38 of the insert 36. A nozzle 44 in communication with the hollow interior 46 of the cylinder 40 is secured to the end walls 48 of the percolator cylinder. An electrical resistor 50 is positioned within the outer portion of the percolating container 40 and is electrically connected to conductors 52 and 54 terminally thereof. The resistor on the conductors are held in spaced relationship by a plug 56 inserted in the aperture of the insert 36.

In alignment with the nozzle 44 of the second container 40 are the delivery means indicated by reference numeral 58 which comprise a heat insulating shield 60 coaxial with and surrounding a delivery and heating tube 62. An electrical heating element comprising a resistor 64 is positioned between the delivery and heating tube 62 and the insulating shield 60 by being wound around the heating tube 62. Resistor 64 is terminally connected to conductors 68 and 70 which in turn are connected to conductors 54 and 72 respectively.

An end of the delivery tube 62 is inserted within one end of a nipple 74 having an annular flange 76 therearound. The flange 76 is of hexagonal shape for engagement with a wrench or the like. A jet 78 having a nipple 80 secured at one end thereof extends into the venturi 14, and is provided with a desired orifice. Obviously, the nipples 74 and 80 can be optionally made integral. These nipples 74 and 80 fit into the carburetor

in precisely the same manner as the original and conventional jet would.

A thermostatic element 82 is secured within the port 32 and is electrically connected with conductor 54. The percolating cylinder 40 is provided with a plurality of annularly spaced apertures 84 to permit fluid flow from the outer container 20 into the inner portion 46 of the inner container. One of the apertures 84 is used for passage of conductors 68 and 70. The thermostat 82 is provided with an internal ground.

Referring now to Figure 4, the operation of the device may be readily followed. The ignition switch 86 is closed which causes the resistor 64 to heat. The starter motor is then energized which causes the switch 88 to close the circuit to the resistor 50. The switch 88 may optionally be a unidirectional magnetic relay or selenium cell in order to maintain the correct direction of current flow as desired. The resistor 50 causes the boiling of the fuel in contact with it and will cause the fuel to eject itself through the nozzle 44 of the inner percolator cylinder. The resistor 50 thereby enriches the gasoline mixture sufficiently to permit the engine to start. The engine having started, the starter motor will be disengaged, and the current will no longer be permitted to heat the resistor 50. The ignition switch 86 obviously remains in closed position and therefore allows the resistor 64 to remain on until the temperature of the incoming fuel rises high enough to cause the thermostat 82 to open the circuit. Complete weather and climatic control of the unit is therefore possible with the thermostat connected in the manner described above.

If, for any reason whatsoever, the free air temperature, the fuel temperature, or the engine temperature, or any combination of the three temperature factors is sufficiently high enough to warrant mixture enrichment unnecessary, then the thermostat will permit neither of the heating elements to function. Thus, it is seen that the design is an all-weather automatic control which has no moving parts except for the starter switch. If properly designed and properly adjusted, the unit will perform the duties of a choke, either manual or automatic, without any harmful flooding which is inevitable with either type of the conventional choke.

It is to be noted that this device may be designed either as an attachment for an existing carburetor or may alternatively be incorporated in the functional design of the carburetor itself.

Since from the foregoing, the construction and advantages of this electric carbureting heating

element may be readily understood, further explanation is believed to be unnecessary.

However, since numerous ramifications will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to exact carburetor structure shown and described, but all suitable modifications and equivalents may be resorted to which fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A fuel heater and vaporizer comprising an outer container having a first reduced open end and a second open end, a threaded insert having an aperture therethrough in said second end, an inner container having a reduced end and another end secured to said insert, delivery means a first end of which is positioned within said first container in alignment with the reduced end portion of said second container, means maintaining said delivery means in spaced relationship from said first end of said outer container, and heating means including an electrical resistor positioned within said second container receivable through said insert, an outwardly extending female threaded port in the first container, thermostatic means secured within said port, said thermostatic means being operatively connected to said heating means to selectively control the electrical power supply thereto, said heating means also including an electrical resistor about said delivery means.

2. The structure of claim 1 including a plurality of spaced apertures in said second container.

3. The structure of claim 2 including a jet comprising a hollow cylindrical tube having an externally threaded end and a discharge end, the second end of said delivery means being externally threaded and female threaded means holding said jet and said delivery means in alignment.

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