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FUEL-MIXTURE VAPORIZER FOR GAS ENGINES

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Fig. 1

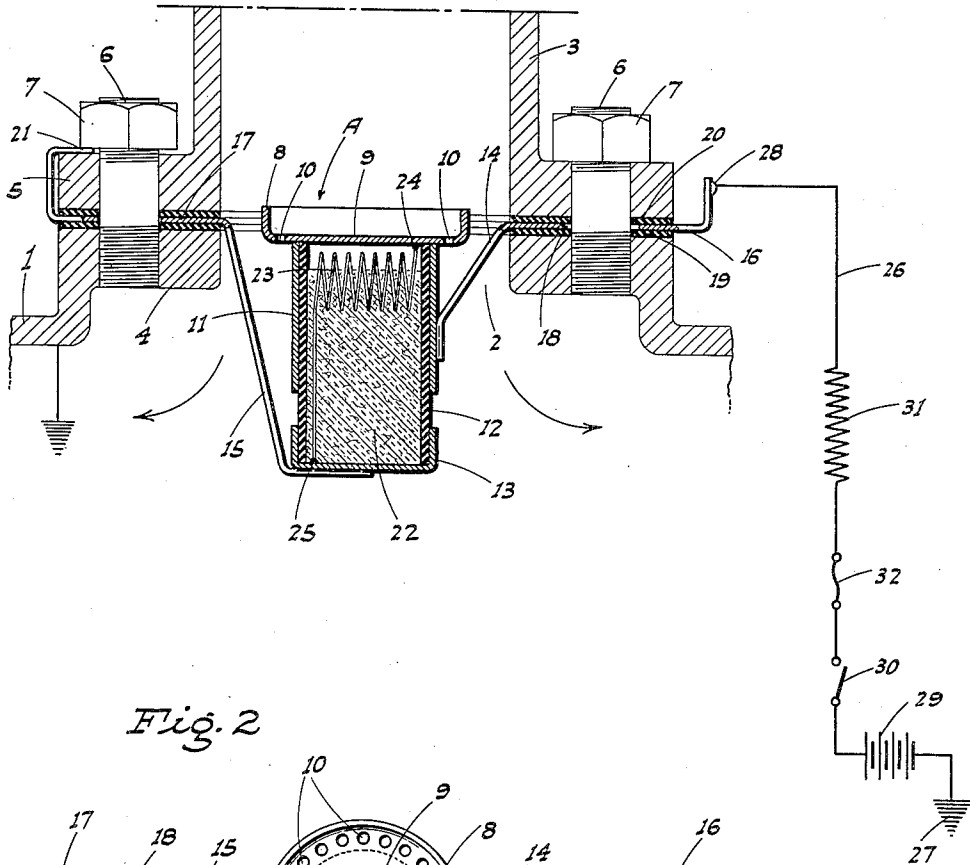
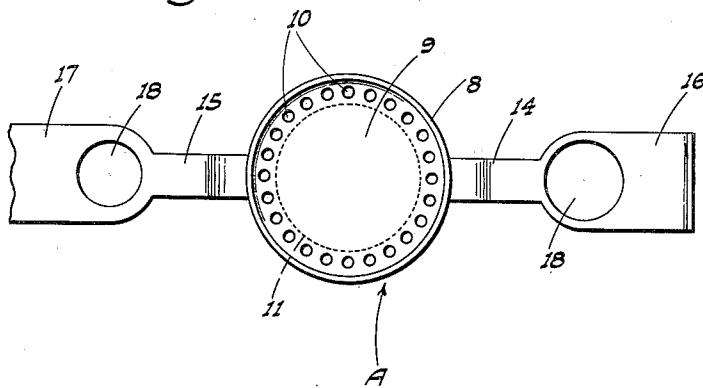


Fig. 2



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FUEL-MIXTURE VAPORIZER FOR GAS ENGINES

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9 Claims. (Cl. 219—38)

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This invention is directed to, and it is an object to provide, a novel fuel-mixture vaporizer for gas engines, especially in motor vehicles.

Another object of the invention is to provide a fuel-mixture vaporizer which embodies a novel electro-mechanical device for the accomplishment of the purpose; such device including a shallow metallic cup mounted in position to be impinged by the mixture discharged from the carburetor, and said cup being heated by an electric resistance element associated with the cup in a unique manner.

A further object of the invention is to employ separate mounting elements, which support the device in position, as the electric leads for the resistance heating element.

An additional object of the invention is to provide a fuel-mixture vaporizer which assures easier and quicker starting of the engine when cold; the device also increasing the efficiency of the engine, and reduces fuel consumption under normal operating conditions.

It is also an object of the invention to provide a fuel-mixture vaporizer for gas engines which is designed for ease and economy of manufacture.

Still another object of the invention is to provide a practical and reliable fuel-mixture vaporizer for gas engines, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a sectional elevation of the device as in use; the electric circuit being shown diagrammatically.

Fig. 2 is a top plan view of the device detached.

Referring now more particularly to the characters of reference on the drawings, the device, indicated generally at A, is adapted to be suspended in the intake manifold 1, of a gas engine, from within the fuel mix entry port or throat 2 which said manifold includes; such port being in communication with the downwardly extending neck 3 of a down-draft type carburetor (not shown). The manifold 1 and neck 3 are connected by matching attachment flanges 4 and 5 secured together by studs 6 having a nut 7 on the exposed end thereof.

The device A comprises, in the form of a unitary body, a circular, relatively shallow metallic cup 8 of a substantial diameter but lesser than that

of the port 2; such cup 8 being disposed, in the port 2, radially of its axis and facing in the direction of fuel mixture flow in the neck 3; i. e. facing upwardly.

The bottom 9 of the cup 8 is flat and of substantial surface area, whereby it is impinged by a substantial portion of the fuel mixture flow downwardly in the neck 3 of the carburetor. The bottom of the cup 9 is formed, adjacent its periphery, with an annular row of perforations 10, and a mounting sleeve 11 of metal is fixed to, and depends from, said bottom 9 of the cup inwardly of the perforations 10, being symmetrical to the row of the latter.

The mounting sleeve 11 closely surrounds a vertical tube 12 of dielectric heat resistant material; such tube 12 extending from the bottom 9 of the cup 8 downwardly to a termination below the sleeve 11.

At the bottom thereof the dielectric tube 12 seats in, and is supported by, a bottom cap 13 of metal; the adjacent ends of the sleeve 11 and bottom cap 13 being spaced and thus maintained against electrical contact.

Metal straps 14 and 15 are fixed to the mounting sleeve 11 and bottom cap 13 respectively, and extend upwardly in diverging relation on opposite sides of the device; such straps having laterally outwardly projecting upper end tongues 16 and 17 which engage, in supported relation, between the adjacent portions of the attachment flanges 4 and 5, as shown. The tongues 16 and 17 have holes 18 through which the studs pass. In this manner the device is effectively supported in position, and additionally the straps 14 and 15 provide electrical leads as follows:

The tongue 16 of strap 14 passes between flanges 4 and 5, from which it is insulated, or maintained out of electrical contact, by opposed dielectric gaskets 19 and 20 mounted in connection with the flanges and symmetrical thereto as usual. Similarly, tongue 17 of strap 15 also passes between the gaskets on the opposite side but is then grounded to the engine, as by clamping under the adjacent nut 7, in the manner indicated at 21.

It will thus be recognized that the metallic sleeve 11 and the bottom cap 13 comprise electrically separated parts; i. e. form the electrical leads from exteriorly of the carburetor and manifold structure leading to the device within said structure.

The dielectric tube 12 has a quantity of asbestos 22 disposed therein, with the upper sur-

face of such asbestos adjacent, but short of, the bottom 9 of the cup 8.

A resistance heating element 23, in the form of a helical coil, extends from side to side within the dielectric tube 12 adjacent the top of the latter; a portion of said coil being embedded in the asbestos, while another portion projects into the space thereabove immediately below the cup bottom 9. One end of the resistance heating element 23 is connected, as at 24, to the cup bottom 9, while the other end of said element is connected to the bottom 13, as at 25. In this way the resistance heating element 23 is in circuit between the metal straps 14 and 15, and the latter are imposed in the following energizing circuit:

A circuit lead 26 extends from a ground 27 at one end to connection with the exterior portion of the tongue 16 of strap 14, as at 28; such lead 26 having the storage battery 29 interposed therein, as well as the ignition switch 30 when the invention is employed on a motor vehicle.

A resistor 31 of suitable capacity is interposed in the lead 26 between the switch 30 and the connection 28; there being a fuse 32 between said switch and resistor. The circuit is completed by the grounding of tongue 17. Thus, when the switch 30 is closed the resistance heating element 23 is energized, heating the cup bottom 9.

The fuel mixture flowing downwardly in the carburetor neck 3 impinges into the cup 8 against the heated bottom 9 thereof, effectively vaporizing such mixture; the vaporized mixture rebounding and spilling out of the cup, or passing downwardly through the row of perforations 10 into the manifold 1. By so vaporizing the fuel mixture the engine starts much easier, and additionally when in operation functions more efficiently.

The asbestos 22 in the dielectric tube 12 prevents heat loss in a downward direction and assures that the cup bottom 9 obtains maximum heating from the element 23; the embedding of the latter in the asbestos serving to stabilize said element.

The invention provides a very practical and reliable device for the vaporizing of the fuel mixture in a gas engine, and such device is designed so that it may be manufactured with economy, and readily installed.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. A vaporizer adapted to be mounted in a fuel-mixture passage of a gas engine, comprising a body having an electric resistance heating element therein, one portion of the body being of substantial surface area and heated by said resistance element, said portion of the body being disposed so that the fuel-mixture impinges thereagainst when the body is mounted in the passage, means to mount the body in said position in the passage, and an energizing circuit for the resistance element; said circuit including said mounting means and said mounting

means including a pair of separate members secured to the body in dielectric relation to each other; the resistance element being electrically connected at opposite ends to corresponding members.

2. A vaporizer, as in claim 1, in which said members are straps adapted to be clamped between adjacent carburetor attachment flanges.

3. A vaporizer, as in claim 2, including dielectric gaskets insulating at least one of the straps from the attachment flanges between which said strap is clamped.

4. A vaporizer adapted to be mounted in a fuel-mixture passage of a gas engine, comprising a tube of dielectric, heat resistant material, a metallic cup overlying one end of the tube, a metallic cap on the other end of the tube, a metallic sleeve surrounding the tube in connection with said cup, said sleeve and the cap being spaced at adjacent ends, mounting elements of metal secured to and projecting from the sleeve and cap, and a resistance heating element in the tube connected between said sleeve and cap.

5. A vaporizer adapted to be mounted in a fuel-mixture passage of a gas engine, comprising a tube of dielectric, heat resistant material, a metallic cup overlying one end of the tube, a metallic cap on the other end of the tube, a metallic sleeve surrounding the tube in connection with said cup, said sleeve and the cap being spaced at adjacent ends, mounting elements of metal secured to and projecting from the sleeve and cap, and a resistance heating element in the tube connected between said sleeve and cap; said mounting elements being straps adapted to engage between attachment flanges of a carburetor and manifold assembly.

6. A vaporizer, as in claim 5, including means to insulate one strap from said attachment flanges.

7. A vaporizer adapted to be mounted in a fuel-mixture passage of a gas engine, comprising a tube of dielectric, heat resistant material, a metallic cup overlying one end of the tube, a metallic cap on the other end of the tube, a metallic sleeve surrounding the tube in connection with said cup, said sleeve and the cap being spaced at adjacent ends, mounting elements of metal secured to and projecting from the sleeve and cap, and a resistance heating element in the tube connected between said sleeve and cap; the metallic cup being of greater diameter than the sleeve and facing away therefrom, said cup having a bottom which is perforate radially of the sleeve.

8. A vaporizer adapted to be mounted in a fuel-mixture passage of a gas engine, comprising a tube of dielectric, heat resistant material, a metallic cup overlying one end of the tube, a metallic cap on the other end of the tube, a metallic sleeve surrounding the tube in connection with said cup, said sleeve and the cap being spaced at adjacent ends, a resistance heating element in the tube adjacent its upper end in heating relation to the bottom of the cup, said element being electrically connected between the cup and the cap, mounting elements of metal secured to the sleeve and cap and extending therefrom, each mounting element including a flat tongue adapted to engage between and project outwardly from, the attachment flanges of a carburetor and manifold assembly, and means to insulate one tongue from said assembly.

9. A vaporizer, as in claim 8, including a quantity of heat insulating material in the tube; the

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resistance heating element being a helical coil transversely disposed in the tube, and said material partially embedding a longitudinal portion of said coil.

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