Dec. 30, 1952 Z. O. CANTRELL 2,623,978

FUEL VAPORIZING DEVICE

Filed Feb. 16, 1951

FIG. 1.

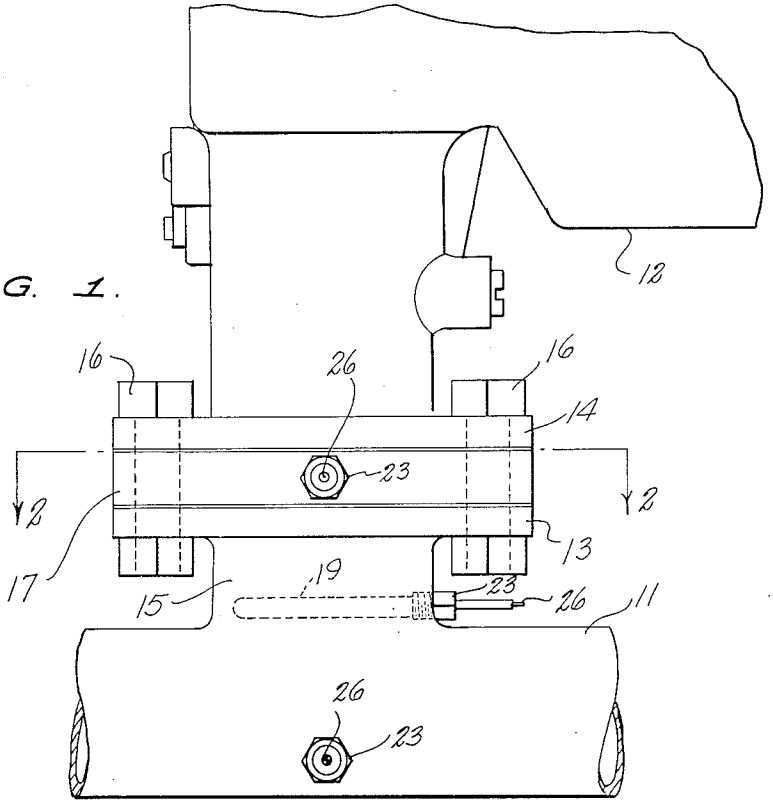


FIG. 2.

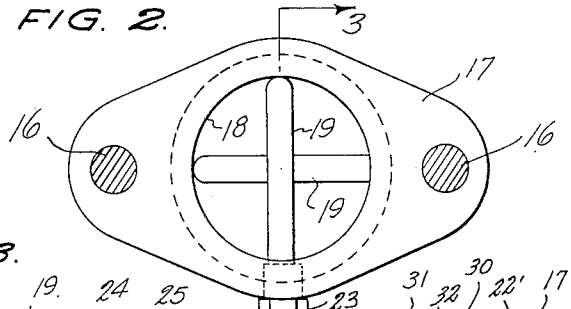


FIG. 3.

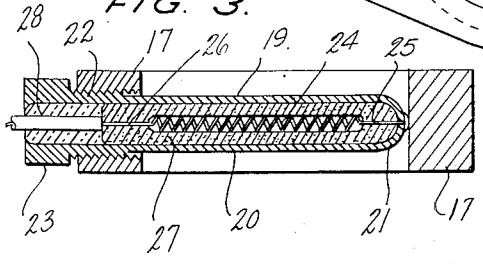
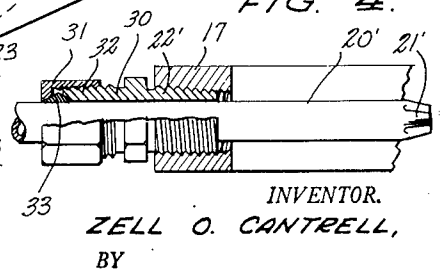


FIG. 4.



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FUEL VAPORIZING DEVICE

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1 Claim. (Cl. 219—38)

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This invention relates to vaporizing devices, and more particularly to an electrical fuel vaporizing device for use in internal combustion engines.

A main object of the invention is to provide a novel and improved vaporizing device for use in the intake manifold of a motor vehicle to facilitate the starting of the vehicle engine in cold weather, the fuel vaporizing device being very simple in construction, being easy to install, and being compact in size.

A further object of the invention is to provide an improved fuel vaporizer for an internal combustion engine, said vaporizer being inexpensive to manufacture, being rugged in construction, requiring very simple tools to install, and providing sufficient heat to vaporize gasoline and similar fuel to facilitate the starting of the internal combustion engine with which it is employed under cold weather conditions.

Further objects and advantages of the invention will become apparent from the following description and claim, and from the accompanying drawings, wherein:

Figure 1 is a side elevational view showing the lower portion of a carburetor and a portion of the intake manifold of an internal combustion engine equipped with improved fuel vaporizing means according to the present invention;

Figure 2 is a cross-sectional view taken on line 2—2 of Figure 1;

Figure 3 is an enlarged cross-sectional detail view taken on line 3—3 of Figure 2.

Figure 4 is a fragmentary longitudinal cross-sectional view showing a modified form of fuel vaporizing device according to the present invention.

Referring to the drawings, 11 designates the intake manifold of an internal combustion engine employed in a motor vehicle, and 12 designates a conventional carburetor which is ordinarily connected to the intake manifold 11 through respective flanged connector members 13 and 14 provided on the manifold and on the carburetor. As shown in Figure 1, the flanged connection element 13 is at the top end of an upwardly extending conduit element 15 provided on the manifold 11. The flanged element 14 is part of the base of the carburetor 12, and said element 14 is connected to the element 13 by bolts, such as the bolts 16 shown in Figure 1.

In order to facilitate the starting of the motor vehicle engine under cold weather conditions, suitable fuel vaporizing means may be employed which, in accordance with the present invention,

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may comprise electrical heater cartridges disposed in the connection between the carburetor 12 and the intake manifold 11. For example, a flat, oval, metal body 17 may be disposed between the flanges 13 and 14 and secured therebetween by the bolts 16, as shown in Figure 1, said body being formed with a central opening 18 in registry with the bores of the lower portion of the carburetor 12 and the upstanding conduit element 15. Designated at 19 is a heater cartridge which comprises a tubular shell 20 having a closed end, shown at 21, and formed with an externally threaded portion 22 near its other end which is threaded through the wall of the member 17, as shown, whereby the shell 20 is supported in a diametrically extending portion in the opening 18. The end of the shell 20 adjacent the externally threaded portion 22 is formed with a hexagonal flange 23 enabling the shell member to be rotated by means of a suitable wrench. Designated at 24 is an electrical heating element which is connected at one end to the wall 21, as shown at 25, and which has a terminal 26 at its other end extending through the external end of the shell 20. As shown in Figure 3, the heating element 24 is supported axially in the shell 20 and is surrounded by suitable refractory, electrically insulating material, such as refractory clay. The refractory, heat-insulating material is designated in Figure 3 at 27. Designated at 28 is a suitable electrically insulating filler material disposed between the sheathing of the terminal wire 26 and the wall surface of the internal bore of member 20 adjacent the open end of said shell member.

As shown in Figure 3, the terminal 25 is grounded, and the terminal 26 is connected by a suitable conductor, not shown, to the ungrounded terminal of the vehicle battery, a suitable control switch being interposed between the terminal 26 and said ungrounded battery terminal, said control switch being preferably located on the vehicle dashboard. When it is desired to start the vehicle in cold weather, it is merely necessary to close the switch, thereby energizing the heater winding 24, whereby heat is transmitted from the cartridge 19 to the fuel passing from the carbureter into the intake manifold 11. Vaporization of the fuel occurs relatively rapidly, enabling the engine to start without imposing undue drain on the vehicle battery by excessive use of the engine starting motor.

If so desired, additional cartridges 19 may be employed in the manner shown in Figure 1. For example, a cartridge may be disposed in the ver-

tical portion 15, and still another cartridge may be disposed in the lower portion of the intake manifold 11 in vertical alignment with the intake conduit 15 of the manifold 11. Where a plurality of cartridges 19 are employed, as shown for example in Figure 1, the heating elements of the cartridges may be connected in parallel to the ungrounded terminal of the vehicle battery through the same control switch.

Referring now to Figure 4, an alternative form of the invention comprises the tubular shell 20' containing the electrical heating element, said shell having one closed end, which may be formed by crimping the end of the shell closed, as shown at 21'. The end of the heating element is electrically connected to the crimped end 21'. The other end of shell 20' extends through a compression nipple 30 having one threaded end 22' engaged in the metal body 17 and having a clamping nut 31 engaged on its other threaded end 32. A wedge ring 33 is positioned between nut 31 and the end 32 of nipple 30 in the manner shown, whereby the shell 20' will be securely clamped to the nipple by tightening the nut 31. The electrical heating element is supported in the shell 20' in the same manner as described in connection with Figures 1 to 3. The arrangement of Figure 4 allows the effective length of the heating cartridge in the body 17 to be adjusted to any value desired.

While certain specific embodiments of an improved fuel vaporizing device for internal combustion engines has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed

on the invention except as defined by the scope of the appended claim.

What is claimed is:

A fuel vaporizing device for internal combustion engines comprising an elongated tubular metal cartridge having one end open and the other end closed, a flange encircling said cartridge adjacent the open end thereof, external threads on said cartridge extending inwardly from said flange and terminating at a point spaced from said flange, an electrical heating resistance disposed axially within said cartridge and having one end connected to said closed end of said cartridge, the other end of said resistance extending out of said open end of said cartridge, the portion of said resistance adjacent said other end thereof carrying a sheathing, electrically insulating filler material disposed within said cartridge adjacent the open end and surrounding the sheathed portion of said resistance, and a body of refractory and electrically insulating material disposed within said cartridge adjacent said closed end in abutting relation with respect to said filler material and surroundingly supporting the unsheathed portion of said resistance.

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