Dec. 3, 1935. C. W. WHITE 2,023,185

FUEL VOLATILIZING DEVICE

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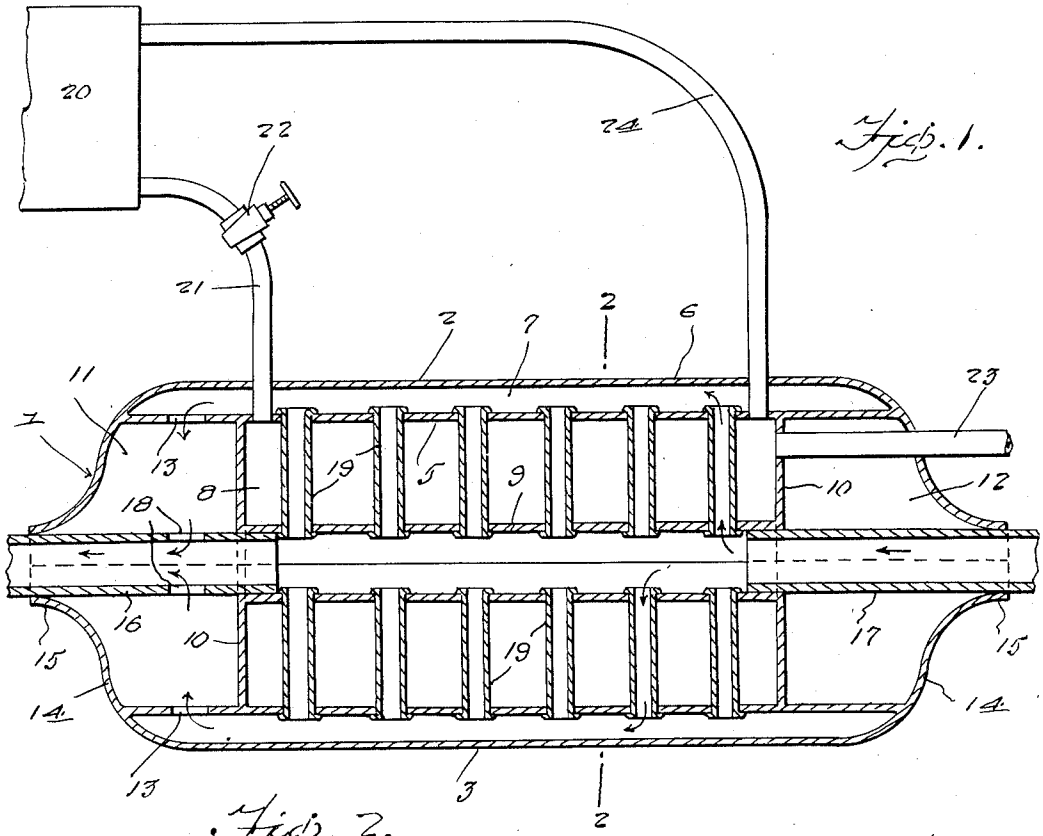
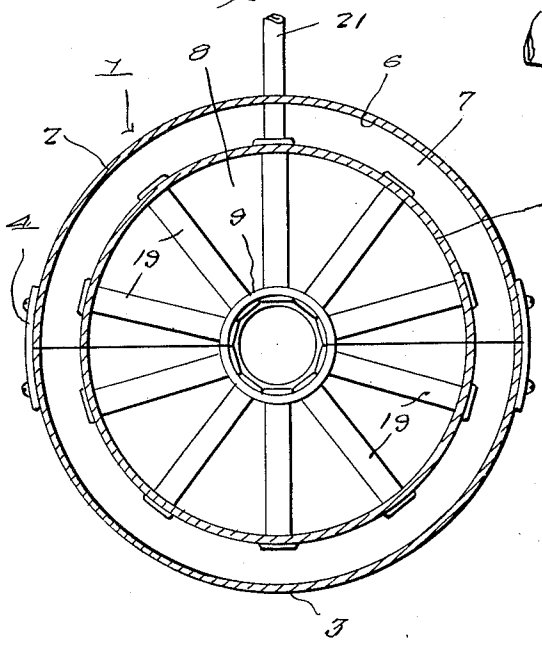



Fig. 1.

Fig. 2.



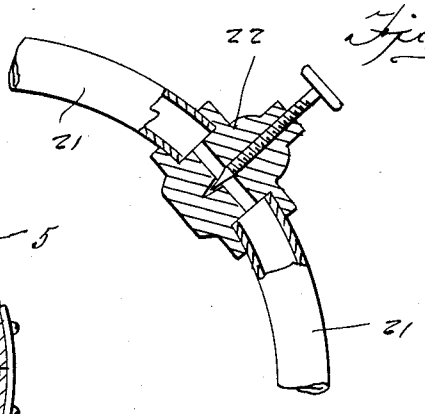




Fig. 3.

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Fig. 4.

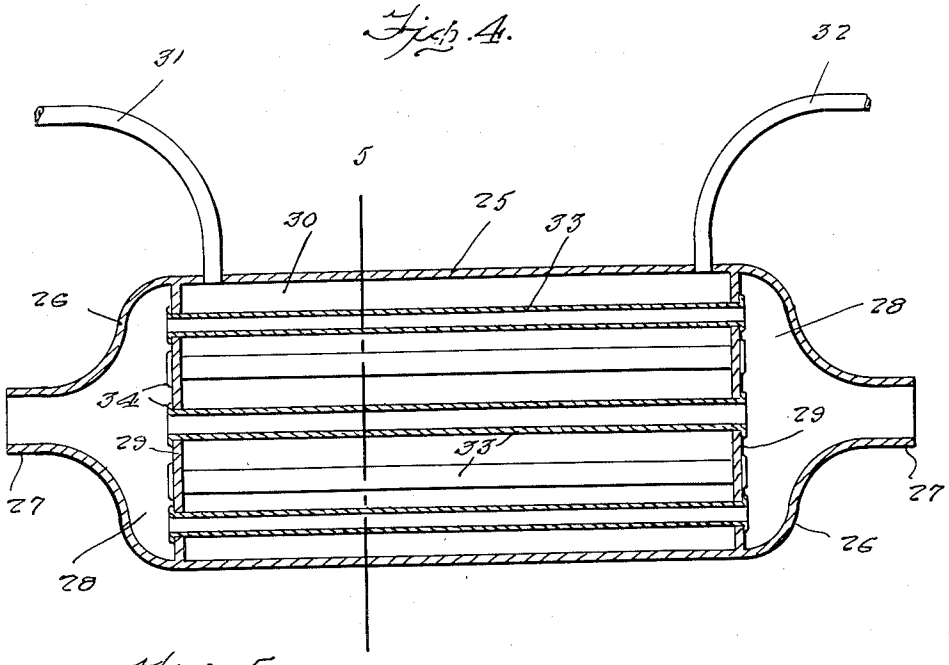



Fig. 5.

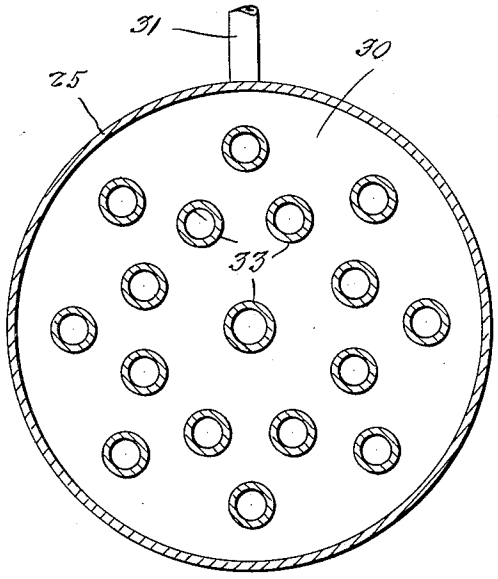
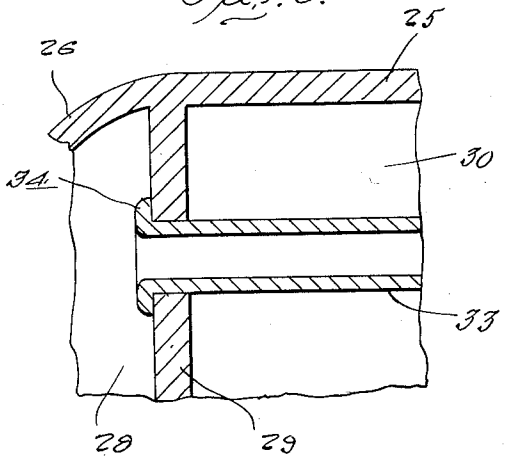



Fig. 6.




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Fig. 7.

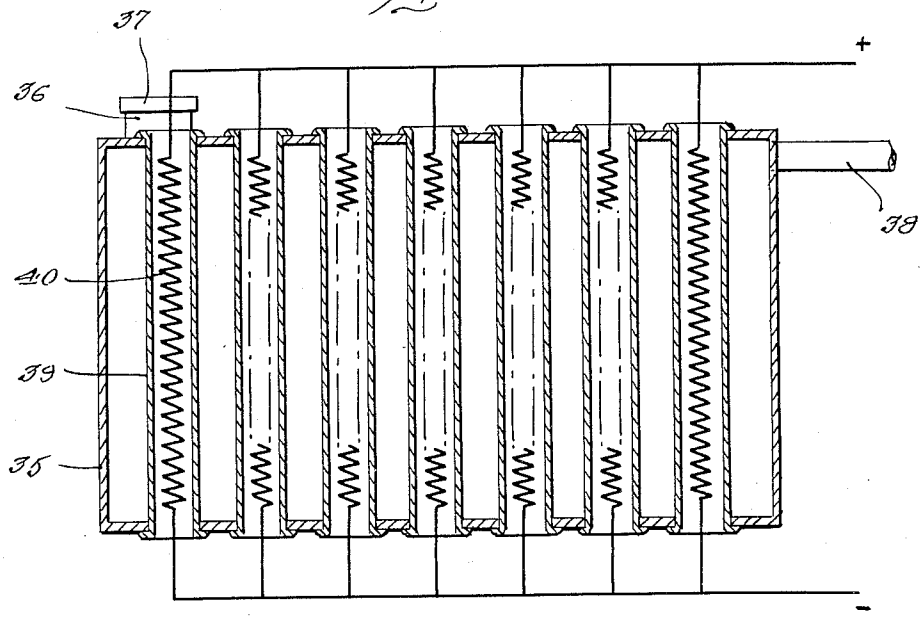
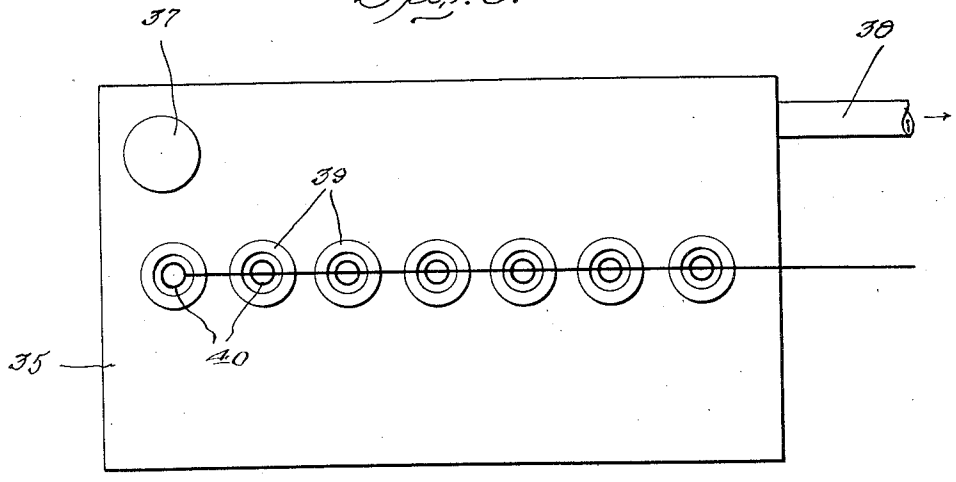



Fig. 8.




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Patented Dec. 3, 1935

2,023,185

# UNITED STATES PATENT OFFICE

2,023,185

## FUEL VOLATILIZING DEVICE

Clarence Wilbur White, Chicago, Ill.

Application January 3, 1935, Serial No. 309

1 Claim. (Cl. 219—38)

The present invention relates to new and useful improvements in fuel volatilizing devices for use particularly with internal combustion engines and has for its primary object to materially reduce the fuel consumption of the engine and to otherwise increase its efficiency by introducing the fuel thereinto in the form of a vapor.

Other objects of the invention are to provide a fuel volatilizing device of the aforementioned character which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact, and which may be manufactured and installed at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:—

Figure 1 is a view in vertical longitudinal section through an embodiment of the invention.

Figure 2 is a view in vertical transverse section, taken substantially on the line 2—2 of Figure 1.

Figure 3 is a detail view in vertical section through the control valve.

Figure 4 is a view in vertical longitudinal section through a modified form of the invention.

Figure 5 is a view in vertical transverse section, taken substantially on the line 5—5 of Figure 4.

Figure 6 is a fragmentary view in vertical longitudinal section, showing the connection of the flues with one of the header plates in that form of the invention shown in Figures 4 and 5.

Figure 7 is a view in vertical longitudinal section through another modification.

Figure 8 is a view in top plan of the modification shown in Figure 7.

Referring now to the drawings in detail, and to Figures 1 to 3, inclusive, in particular, it will be seen that the reference numeral 1 designates generally an elongated, tubular casing of suitable metal, said casing including complemental upper and lower half sections 2 and 3, respectively, which are secured together, as at 4.

The casing 1 further includes spaced inner and outer walls 5 and 6, respectively, providing a chamber 7. The wall 7 constitutes the outer wall of volatilizing chamber 8 having a centrally located conduit 9 extending longitudinally therethrough. The end walls 10 of the volatilizing chamber 8 are spaced inwardly from the ends of the inner wall 5, thus providing chambers 11 and 12 in the end portions of the casing 1. The heating chamber 7 communicates with the chamber 11 through openings 13.

The end walls 14 of the casing 1 are formed to provide longitudinally projecting necks 15 which are aligned with the conduit 9 for the reception of the exhaust pipe sections 16 and 17, the former having inlet openings 18 therein for receiving the exhaust gases which enter the chamber 11 through the openings 13 from the chamber 7. As illustrated to advantage in Figure 1 of the drawings, the exhaust pipe sections 16 and 17 extend longitudinally through the chambers 11 and 12 and have their inner end portions engaged in the conduit 9. Radial flues 19 conduct exhaust gases through the volatilizing chamber 8 from the conduit 9 to the heating chamber 7.

The volatilizing chamber 8 is connected, at one end, with a fuel tank 20 by a pipe 21 having interposed therein a control valve 22 which is preferably, but not necessarily, of the needle type, as shown to advantage in Figure 3 of the drawings. A delivery pipe 23 to the engine (not shown) is connected to the other end of the volatilizing chamber 8. The reference numeral 24 designates a pressure equalizing pipe which extends between the volatilizing chamber 8 and the fuel tank 20.

It is believed that the operation of the invention will be readily apparent from a consideration of the foregoing. Exhaust gases from the engine enter the casing 1 through the exhaust pipe section 17. Some of the exhaust gases pass directly to the outlet pipe section 16 through the conduit 9. The rest of the exhaust gases pass through the radial flues 19 into the chamber 7, then through the openings 13 into the chamber 11, and then through the openings 18 into the exhaust pipe section 16 thus thoroughly heating the volatilizing chamber 8. Fuel in liquid form from the supply tank 20 passes through the pipe 21 into the chamber 8 where it is volatilized and in this state said fuel flows to the engine through the delivery pipe 23. Of course, the flow of fuel to the chamber 8 is controlled by the valve 22.

In Figures 4 to 6, inclusive, of the drawings, the reference numeral 25 designates an elongated, tubular casing of suitable metal the end walls 26 of which have formed therewith longitudinally projecting necks 27 for connection with exhaust pipe sections (not shown).

Mounted in the end portions of the casing 25, in spaced relation to the end walls 26 in a manner to provide chambers 28, are header plates 29 which constitute the end walls of a volatilizing chamber 30. The chamber 30 receives fuel from a supply tank (not shown) through a pipe

31. The reference numeral 32 designates a delivery pipe from the chamber 30 to the engine (also not shown).

Extending between the header plates are flues 33 which conduct exhaust gases through the chamber 30. The ends of the flues 33 are flanged, as at 34, for anchoring said flues in the header plates 29.

The chamber 30 is thoroughly heated by the exhaust gases passing through the flues 33, as will be readily apparent. Fuel in a liquid state enters the chamber 30 through the conduit 31 where said fuel is vaporized. The vaporized fuel is then delivered to the engine through the conduit 32.

In Figures 7 and 8 of the drawings, the reference numeral 35 designates a fuel tank which is provided with a filler neck 36 having a removable cap 37. The reference numeral 38 designates a delivery pipe for the vaporized fuel which is connected to the tank 35.

Extending vertically through the tank 35 is a series of tubes or flues 39 having mounted therein electric heating elements 40. The electric heating elements may be energized from any suitable source as, for example, the storage battery of the automobile.

In the operation of that form of the invention illustrated by Figures 7 and 8, the fuel in the tank 35 is vaporized by the heat from the elements 40, the vapors passing from said tank 35 to the engine through the delivery conduit 38. Of course, any desired number of flues 39 and heating elements 40 may be provided. It will further be understood that a suitable switch may be provided for controlling the current to the heating elements 40.

It is believed that the many advantages of a fuel volatilizing device constructed in accordance with the present invention will be readily understood, and although preferred embodiments of the invention are as illustrated and described, it is to be understood that further modifications and changes in the details of construction may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:—

A fuel volatilizing device adapted to be interposed in the exhaust pipe of an internal combustion engine comprising a casing including spaced inner and outer walls providing a heating chamber, a volatilizing chamber in the casing surrounded by the heating chamber, a conduit extending through the volatilizing chamber, radial flues extending through the volatilizing chamber from the conduit to the heating chamber, the casing including end walls having openings therein, the volatilizing chamber including end walls spaced inwardly from the end walls of the casing for providing chambers in said casing at the ends of said volatilizing chamber, the inner wall of the casing extending between the end walls of the volatilizing chamber and the end walls of the casing, an exhaust pipe section extending through one of the third-named chambers into the conduit, an exhaust pipe section extending through the other of the third-named chambers into the conduit, the inner wall of the casing having openings therein for the passage of exhaust gases from the first-named chamber into said other of the third-named chambers, the second-named exhaust pipe section having openings therein for receiving the exhaust gases from said other of the third-named chambers, means for delivering fuel to the volatilizing chamber, and means for conducting the fuel from said volatilizing chamber.

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