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FUEL VAPORIZER FOR CARBURETOR INTAKES

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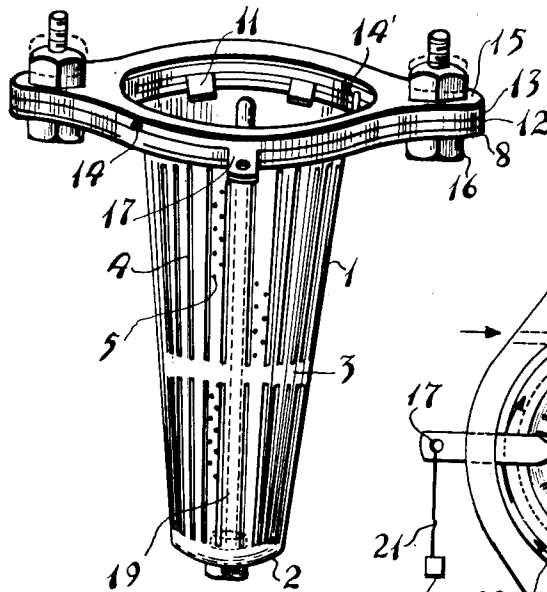


Fig. 1

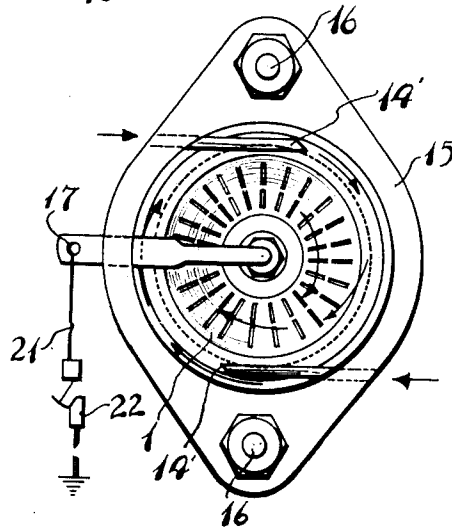


Fig. 2

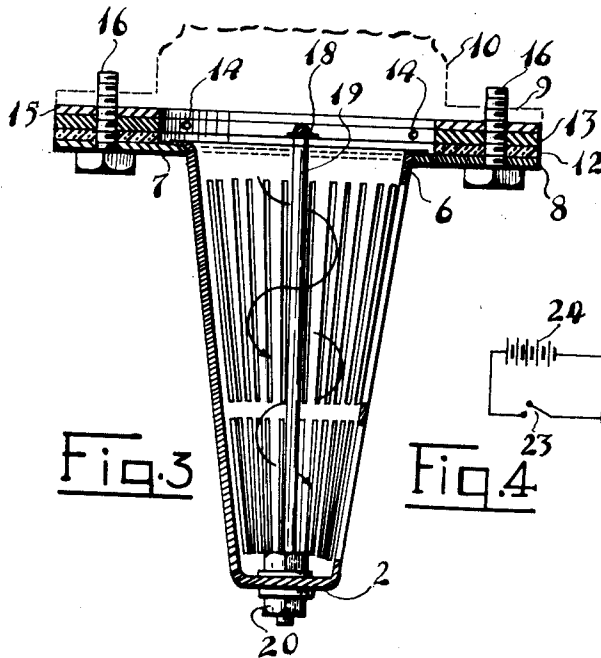


Fig. 3

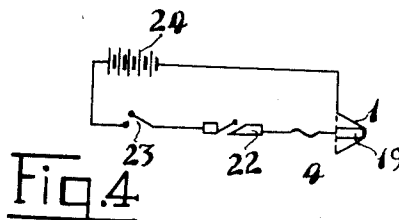


Fig. 4

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FUEL VAPORIZER FOR CARBURETOR INTAKES

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2 Claims. (Cl. 219-38)

My invention relates to new and useful improvements in cold starting and fuel vaporizing systems for automotive engines, an object of my invention being to provide a device of the character herewithin described which rapidly preheats the fuel passing from the carburetor to the intake manifold thus assisting in the starting of the engine even in zero or sub-zero temperatures.

A further object of my invention in conjunction with the foregoing object is to provide a device of the character herewithin described which assists in the atomization of the fuel as well as in the efficient mixing thereof with air prior to burning.

A still further object of my invention is to provide a device of the character herewithin described which even after the preheating period, still acts as a vaporizer due to heat conducting to the elements from the manifold of the engine.

Still another object of my invention is to provide a device of the character herewithin described which includes an automatic timing means to prevent the element from being connected to the battery for too long a period.

A still further object of my invention is to provide a device of the character herewithin described which is readily attachable between the carburetor and intake manifold of an engine without any modification to the existing system.

A still further object of my invention is to provide a device of the character herewithin described which is economical in manufacture, simple in construction, and otherwise well suited for the purpose for which it is designed.

With the foregoing objects in view, and such other objects and advantages as will become apparent to those skilled in the art to which this invention relates as this specification proceeds, my invention consists essentially in the arrangement and construction of parts all as hereinafter more particularly described, reference being had to the accompanying drawings in which:

Figure 1 is a perspective view of my device per se.

Figure 2 is a top plan view thereof.

Figure 3 is a side sectional elevation of my device.

Figure 4 is a wiring diagram showing one means of connecting my device to the auto battery.

In the drawings like characters of reference indicate corresponding parts in the different figures.

The starting of automobile engines in zero and sub-zero weather presents many difficulties, the principal difficulty being the inefficient vaporization of the fuel as it is drawn from the carburetor into the intake manifold. Attempt has been made to overcome this inefficiency mainly by providing immersion heaters and the like within the cooling system of the engine but it will be appreciated that any heat passing from the warmed coolant to the intake manifold is by conduction only and that the temperature within the intake will not rise sufficiently to provide efficient vaporization of the fuel.

I have overcome these disadvantages by providing a heating element directly within the intake between the carburetor and the intake manifold, the fuel passing through this element thereby permitting same to be vaporized immediately and completely.

Proceeding now to describe my invention in detail, reference should be made to the accompanying drawings and in this connection, it should be appreciated that I have not shown an intake manifold or a carburetor.

My device comprises a substantially hollow conical

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element 1 made preferably of carbon to provide the necessary resistance to the current flow, said element being truncated inasmuch as the apical area 2 takes the form of a closure plate formed integrally with the walls 3 of the cone.

The walls 3 of the cone are provided with a plurality of longitudinally extending slots 4 passing therethrough together with a plurality of holes 5 but it will be appreciated that these apertures 4 and 5 may take any form desired providing they permit passage therethrough of the fuel air moisture as will hereinafter be described.

The opposite or base end 6 of the conical element is provided with a flange 7 by which the element is secured to a metallic or conducting flange 8 which has a configuration similar to the flange 9 of the carburetor indicated in phantom at 10. Many ways may be provided for securing the flange 7 of the cone to the flange 8 but I have provided tabs 11 which extend from the flange 8, through apertures within the cone and then being folded downwardly as illustrated in Figure 1.

In interfacial relationship with the metallic flange 8, is an insulating flange 12 which prevents the transfer of heat from the element to the carburetor itself thereby eliminating any danger of preheating occurring in the carburetor body. Superimposed again above this insulating flange 12 is a spacer flange 13, said flange being provided with a plurality of tubes or drillings 14 which extend from the outer edge 13' of the spacer to tubes 14' situated tangentially at the upper end of the cone 6 and clearly shown in Figure 2 of the accompanying drawings.

A conventional gasket 15 completes the assembly of the device to the carburetor 10, conventional bolts 16 being provided to hold the carburetor to the intake manifold as well as holding my device in position within the intake.

A flat terminal strip 17 passes between the spacer 13 and the gasket 12, being insulated therefrom by means of the insulating material 18. This terminal connects to one end of a central electrode 19 which extends vertically through the conical element 1 to the apical area 2 thereof being held in position by means of nuts and washers 20 as clearly shown in Figure 3.

The terminal strip 17 is connected via a fuse 21 to a thermostatic or pneumatic timing switch 22 and thence, via a main switch 23 to the positive side of the battery 24.

From the foregoing and from perusal of Figure 4 it will be seen that the circuit is completed from the end of the electrode 19 secured to the apical area 2 of the cone, through the cone itself and thence to ground.

In operation, the main switch 23 is operated thus closing the circuit. Current flows through the central electrodes to the cone 1 which acts as a resistance and heats up rapidly to approximately 600° F. When the starter is operated, liquid fuel and air are drawn from the carburetor into the cone which heats same thereby vaporizing the fuel content completely whereupon it passes through the apertures 4 and 5 within the walls of the cone to the intake manifold.

The heating of the element takes only a few seconds and the automatic switch 22 breaks the circuit as soon as a predetermined temperature is reached.

After the car has been running for some time, it will be appreciated that heat from the manifold will be conducted to the conical element which will therefore continue to assist in vaporization of the fuel while the engine is running.

It will also be appreciated that air will be drawn in through the tangentially situated tubes 14' which will thus impart a rapid swirling motion to the gas and air mixture passing into and through the cone thereby further assisting in the atomization and efficient mixing of the constituent.

Since various modifications can be made in my invention as hereinabove described, and many apparently widely different embodiments of same made within the spirit and scope of the claims without departing from such spirit and scope, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense.

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What I claim as my invention is:

1. A device for assisting in the vaporization and atomization of liquid fuel in automotive carburetor systems, insertable in the intake of an engine between the carburetor and the intake manifold, comprising in combination a hollow heating element having electrical conducting properties, a central electrode connected to and extending from one end of said element to adjacent the opposite end thereof, a plurality of slits in the walls of said element, said slits lying substantially parallel to the fuel flow, said element being selectively connectable in circuit with the battery of said auto, and means for introducing air tangentially to the interior of said element adjacent one end thereof.

2. A device for assisting in the vaporization and atomization of liquid fuel in automotive carburetor systems, insertable in the intake of an engine between the carburetor and the intake manifold, comprising in combination a hollow, conical carbon heating element having electrical conducting properties, a plurality of elongated slits formed in said element, said slits lying substantially parallel to the fuel flow, a central electrode connected to and extending from one end of said element to adjacent

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the opposite end thereof, said element being selectively connectable in circuit with the battery of said auto, said element being provided with a flange at the base thereof, said flange constituting means whereby said element may be secured between said carburetor and said intake, and means for introducing air tangentially to the interior of said element adjacent one end thereof, and adapted to impart a swirling action to the fuel and air passing there-through, said means including a plurality of drillings extending tangentially through the wall of said flange and through the wall of said element adjacent said end.

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