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VAPORIZER

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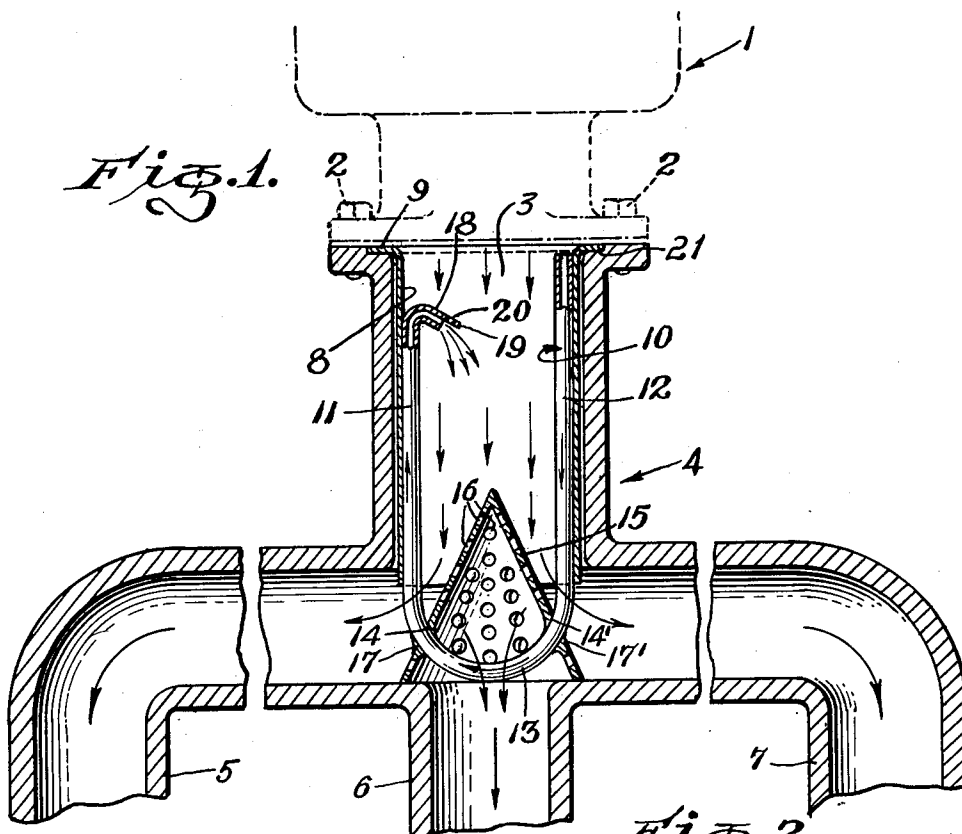


Fig. 2.

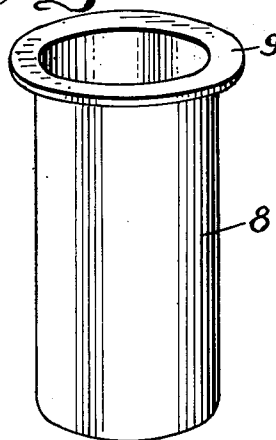


Fig. 4.

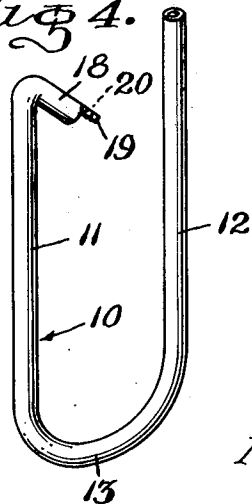
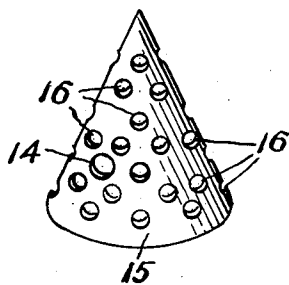


Fig. 5.



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VAPORIZER

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3 Claims. (Cl. 48—180)

This invention relates to internal combustion engines, and more specifically, the invention pertains to a fuel vaporizer adapted to be incorporated in the intake manifold of a conventional internal combustion engine.

One of the primary objects of this invention is to provide a fuel vaporizer for breaking up large and heavy fuel particles delivered by the carburetor to the intake manifold of an internal combustion engine and for preheating the carburetores mixture of air and gas in the intake manifold to obtain a higher degree of combustion whereby the efficiency of the engine is increased.

A further object of this invention is to provide fuel vaporizer means of the type described which atomizes particles of gas delivered to the intake manifold prior to entry thereof into the combustion chambers of the internal combustion engine whereby ignition of such gas particles results in a low carbon residue deposit on the cylinder heads and pistons. Additionally, by obtaining a more complete combustion of the fuel the life of the spark plugs is increased, and the wear on the pistons and rings is reduced to a minimum, thereby preventing blow-backs through the cylinders into the crankcase which carry impurities therewith that are deposited in the crankcase oil and accumulate in an undesirable sludge.

Other and further objects of this invention will become more apparent from a consideration of the following specification when read in the light of the annexed drawing, in which:

Fig. 1 is a cross-sectional view of an intake manifold of a convention-internal combustion engine and illustrating a fuel vaporizer installed therein constructed in accordance with this invention;

Fig. 2 is a perspective view of a substantially hollow cylindrical sleeve comprising an element of this invention;

Fig. 3 is a perspective view of a substantially hollow conical member comprising a second element of this invention; and,

Fig. 4 is a perspective view of a substantially hollow elongated conduit having a nozzle at one end thereof and comprising the third element of this invention.

Referring now more specifically to the drawing, reference numeral 1 designates, in general, a conventional carburetor for an internal combustion engine (not shown) which is connected by stud bolts 2 with the flanged outer end of the throat 3 of a fuel intake manifold 4 having a plurality of conduits 5, 6 and 7 extending therefrom for connection at their respective remote ends with the fuel inlet ports of the engine cylinders.

The fuel vaporizing unit constructed and assembled in accordance with the teachings of this invention comprises (see Figs. 1 and 2) an elongated, substantially hollow, cylindrical sleeve 8 formed of copper and having a pair of opposed open ends of which one end is integrally connected with a laterally and outwardly extending circumferential flange 9.

A length of copper tubing 10 (see Figs. 1 and 4) is bent into a substantially U-shaped configuration to form a pair of spaced, substantially parallel arms 11 and 12 which are connected adjacent one of their respective ends to a base portion 13.

As is seen in Figs. 1 and 3, the length of copper tubing 10 is passed through a pair of diametrically opposed and aligned openings 14, 14' which extend through the wall of a conical member 15 formed of copper, the openings 14, 14' being positioned adjacent the plane of the

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base member. Conical member 15 is also provided with a plurality of transversely extending perforations 16 having uniform diameters smaller than the diameters of the opposed openings 14, 14'. From Fig. 1 it is seen that the conical member 15 is rigidly soldered at 17, 17' to the arms 11, 12 adjacent the juncture thereof with the base portion 13, the arms 11 and 12 projecting away from the plane of the base of the conical member 15 and extending above the apex thereof with their longitudinal axes disposed in a plane common to the plane of the vertical axis of the conical member 15.

The upper end of the arm 11 is bent inwardly towards the parallel arm 12 and downwardly towards the base portion 13 to form a nozzle end 18 having a projecting tip 19 at the free end thereof, the tip 19 having an aperture 20 extending transversely therethrough intermediate its ends.

The arms 11 and 12 are soldered to the interior side of the sleeve 8 and are substantially parallel to the longitudinal axis thereof. In carrying out this operation, the open end of the arm 12 is brought into proximity to the flanged end of the sleeve 8, while the nozzle end 18 of the arm 11 is spaced inwardly therefrom.

The other ends of the arms 11 and 12 project through the open other end of the sleeve 8 and carry the conical member 15 with its vertical axis in coaxial alignment with the longitudinal axis of the sleeve. The conical member is thus subtended from the open other end of the sleeve 8 but has a marginal portion thereof adjacent its apex extending therein.

When the above described vaporizer has been constructed and assembled in the manner set forth, the unit is inserted within the intake manifold throat 3 with the flange 9 resting in a groove 21 formed in the flanged end thereof. In this position, the base of the conical member rests against the inner sides of the conduits 5, 6 and 7.

Assuming that the engine is in operation it will be understood that the intake manifold becomes heated and by conduction causes the conical member 15 to also become heated by operation of the same physical phenomenon. The U-shaped element 10 is also in heat exchange relation with the conical member 15, and as the latter increases in temperature so will the former.

During the operation of the engine, fuel is discharged from the carburetor 1 and passes through the sleeve 8 at which time some of the smaller particles thereof impinge against and are deflected laterally from the conical member 15 to pass through the conduits 5 and 7. Other fuel particles pass through the perforations 16 and into the conduit 6. Heavier and larger particles are also thrown against the conical member 15, the force of the impact together with the influence of the heat of the conical member 15 causing the larger heavier particles to break up and to disperse in smaller particles for delivery to the cylinder.

While the fuel mixture is passing through the sleeve air is drawn into the open end of the arm 12 and passes through the base portion 13 of the U-shaped element 10 to become heated. The fuel passing the nozzle end 18 of the arm 11 creates a slightly lower pressure thereacross whereby the heated air is drawn through the arm 11 and is discharged through the nozzle 18 into the sleeve 8. The heated air mixes with the fuel in sleeve 8 and thus preheats it prior to delivery to the engine cylinders.

From the foregoing specification it will be understood that changes in the dimensions of the several elements of this invention may be made in order to provide vaporizing units for various models of internal combustion engines, and other modifications may be made without departing from the teachings of this invention. It will also be appreciated that the several elements of this invention could be formed and constructed of materials other than copper, and that securing means other than solder could be employed.

Having described and illustrated herein one embodiment of this invention in detail, it is to be understood that the same is offered by way of example and that the

invention is only to be limited by the scope of the following claims.

I claim:

1. An article of manufacture comprising a fuel vaporizing unit for an internal combustion engine comprising an elongated, substantially hollow sleeve having a pair of opposed ends, one of said ends having an integrally formed, laterally extending, flange thereon, a perforated element of conical configuration having at least one side thereof inclined at an angle to the longitudinal axis of said sleeve and having a portion thereof projecting into said sleeve from the opposite end thereof, and a substantially hollow open ended tubular member having a substantially U-shaped configuration extending through the end of said sleeve remote from the end having the flange thereon and secured thereto and to said element whereby said element is fixedly retained in its position relative to said sleeve, said tubular member having a portion thereof extending beyond the end of the sleeve remote from the end of the sleeve having the flange thereon so that the bend of said tubular member is secured to said element interiorly thereof and said tubular member having an end thereof inclined toward the end of the sleeve remote from the end of the sleeve having the flange thereon and comprising a nozzle.

2. An article of manufacture comprising a fuel vaporizer for an internal combustion engine and comprising an elongated substantially hollow cylindrical sleeve having opposed open ends, a radially extending flange integrally formed with one end of said sleeve, a perforated conical member having a pair of diametrically opposed openings formed therein and of greater diameter than the diameter of said perforations, an elongated hollow tubular member having a substantially U-shaped configuration to provide a pair of spaced parallel arms each integrally connected adjacent one of their respective ends with a base portion, means rigidly securing said arms within said sleeve at diametrically opposed sides thereof, said arms having portions thereof projecting outwardly from the other end of said sleeve and connected by said base portion, one end of one of said arms having an end portion thereof inclined towards said conical member, said base portion extending diametrically across said conical member and passing through said pair of opposed openings formed therein, means rigidly securing said conical member with a marginal portion thereof adjacent its apex extending within said other end of said sleeve in spaced relation with respect thereto, and the vertical axis of said conical member being substan-

tially coaxially aligned with the longitudinal axis of said sleeve.

3. In combination with the intake manifold of an internal combustion engine having a throat including a pair of opposed ends with one of said ends being integrally connected with a plurality of conduits adapted for connection with the intake ports of said engine, a flange integrally formed with the other end of said throat and extending radially outwardly therefrom, said flange having a circumferential groove formed therein, and a fuel vaporizer, said vaporizer comprising an elongated substantially hollow cylindrical sleeve having opposed open ends, a radially extending flange integrally formed with one end of said sleeve, a perforated conical member having a pair of diametrically opposed openings formed therein and of greater diameter than the diameter of said perforations, an elongated hollow tubular member having a substantially U-shaped configuration to provide a pair of spaced parallel arms each integrally connected adjacent one of their respective ends with a base portion, means rigidly securing said arms within said sleeve at diametrically opposed sides thereof, one end of one of said arms having an end portion thereof inclined towards said conical member said arms having portions thereof projecting outwardly from the other end of said sleeve and connected by said base portion, said base portion extending diametrically across said conical member and passing through said pair of opposed openings formed therein, means rigidly securing said conical member with a marginal portion thereof adjacent its apex extending within the end of said sleeve remote from the one end of said sleeve having the flange thereon in spaced relation with respect thereto, and the vertical axis of said conical member being substantially coaxially aligned with the longitudinal axis of said sleeve, and said sleeve being slidably insertable within said throat with the flange thereof resting within said groove and said conical member positioned adjacent the inner surfaces of said conduits.

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