C. M. DYER.

FUEL VAPORIZER.

APPLICATION FILED MAY 2, 1918.

1,307,393.

Patented June 24, 1919.

2 SHEETS—SHEET 1.

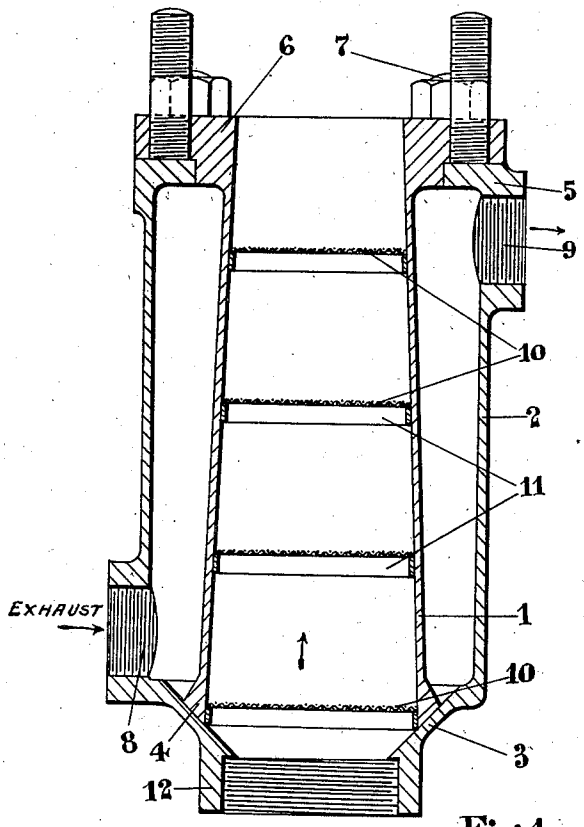


Fig. 1.

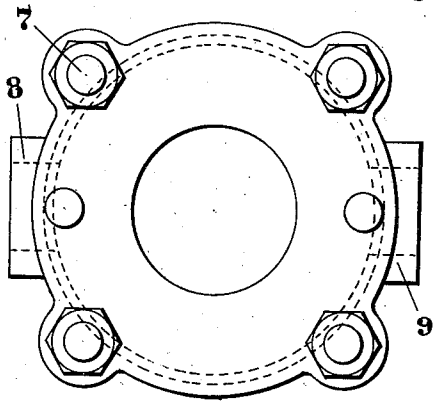


Fig. 2.

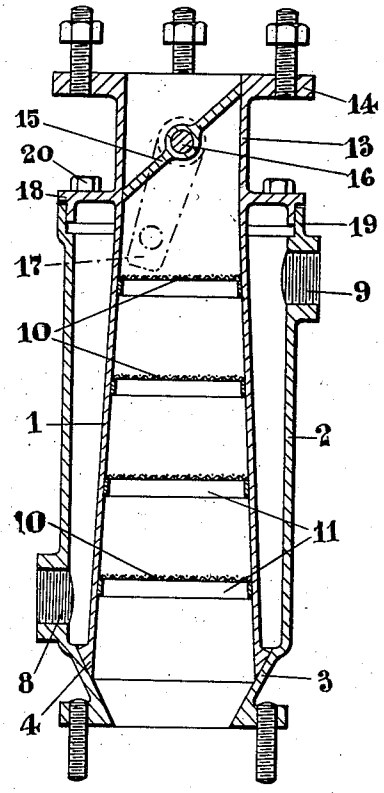


Fig. 3.

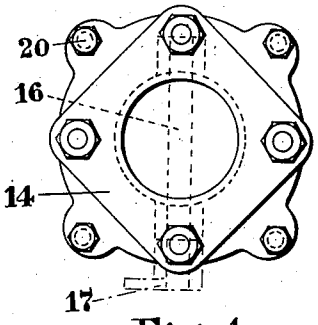


Fig. 4.

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2 SHEETS—SHEET 2.

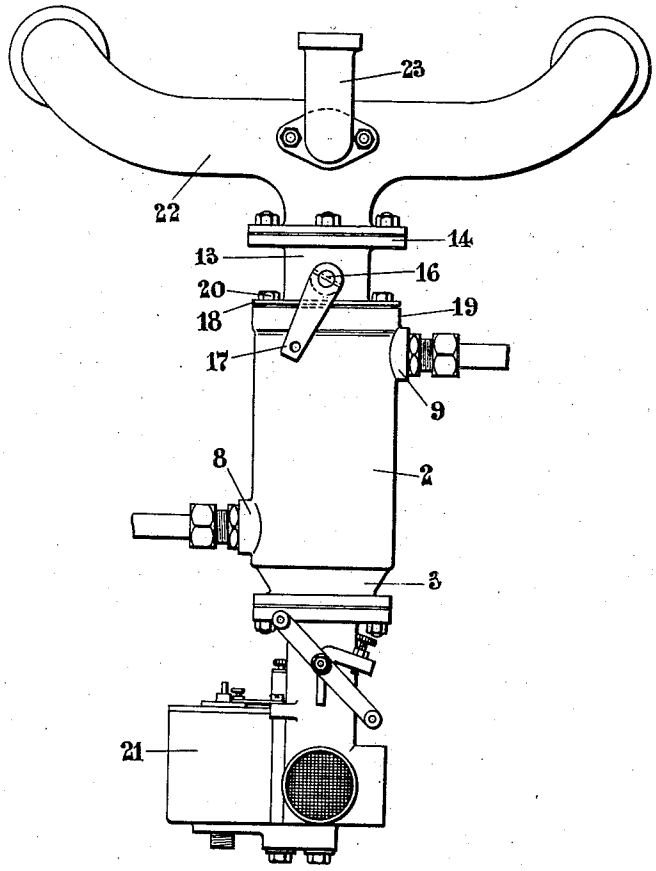


Fig. 5.

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UNITED STATES PATENT OFFICE.

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FUEL-VAPORIZER.

1,307,393. Specification of Letters Patent. Patented June 24, 1919.

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To all whom it may concern:

Be it known that I, CECIL MUNRO DYER, a subject of the King of Great Britain, formerly of Weinberg Road, Hawthorn, in the State of Victoria, Commonwealth of Australia, but now lieutenant in the First Australian Auxiliary Motor Transport Corps, at present on active service, and a resident of Kennington, London, England, have invented certain new and useful Improvements in Fuel-Vaporizers, of which the following is a specification.

This invention relates to vaporizers for use in producing the more effective carbureting of air with combustible gases. It is the object of the invention to provide an improved and simplified construction of vaporizer wherein the casing containing gauze vaporizing screens is fitted in a readily removable but gas-tight manner in the outer jacket, which is heated by exhaust gases from the engine for example. A further object is to prevent filming of the gauze screens with condensed fuel, for which purpose it is found to be desirable to provide for the expansion of the mixture in an enlarged chamber beneath the first vaporizer screen. The construction of the vaporizer according to the present invention enables these and other objects hereinafter more fully set forth, to be attained.

In the accompanying drawings:—

Figure 1 is a sectional elevation, and

Fig. 2 a plan of the one form of construction; while

Fig. 3 is a sectional elevation and

Fig. 4 a plan of another form of construction.

Fig. 5 shows the connection of a vaporizer with a carbureter and the induction pipe of an engine.

Referring first to Figs. 1 and 2, the tapering casing 1, usually formed of copper or of an alloy containing from 40% to 80% of copper, is fitted into the outer shell 2 which serves as a heating jacket, by grinding in at the surfaces where these elements fit together. The lower end of the tapering casing 1 is thickened and coned at 4 to fit into the outwardly tapering lower end 3 of shell 2, and is ground into the same so as to make a close gas-tight fit. The top of the tapering casing 1 is also preferably ground in where it fits the top of the shell. In the construction shown in Figs. 1 and 2, the top 6 of the casing is shouldered to fit over the flanged seating 5 at the top of the shell, and is secured by bolts 7 passing through lugs on the said members, with nuts engaging thereon. The hot exhaust gases are introduced at 8 to the space between the shell 2 and the casing 1, and escape at 9 therefrom.

Inside the tapering casing 1 are arranged gauze screens 10; in the present example four are shown, but the number may be varied according to the type of engine and carbureter with which the apparatus is to be used. The gauze screens 10 may be inserted and held in place in any convenient manner. In the example of construction illustrated in the drawings the said gauze screens 10 are wedged into position and held by means of taper rings 11. Gauze screens of the same mesh throughout can be used, or they can be slightly reduced in size of mesh from the bottom upwardly in the casing. The mesh must not be too fine or with some fuels there may be risk that it will film over, but it must not be too large or the atomizing action will not be completely effected. A gauze with about sixteen wires to the inch in either direction gives satisfactory results as a rule, but of course the size of mesh can be varied to some extent, and the invention is not limited to any particular size.

In order to avoid eddying or irregularity in the passage of the partially formed mixture from the carbureter through the screens, I find it advisable to use a particular form of intake aperture at the bottom. I find that if the pipe section leading upward from the carbureter, terminates in a chamber at the bottom of the apparatus which is shaped so that the section for the flow of the gas is expanded before the gas reaches the first gauze screen, the desired result is attained.

In the example of construction illustrated in Figs. 1 and 2, the vaporizer is of a type adapted to fit on a carbureter with a screw top, such for instance as the well known Claudel type of carbureter, and the threaded portion 12 serves for this purpose. The shell of the vaporizer expands at 3 directly above this fitting, and conveniently provides both the expanding chamber above referred to, and also the conical seating for the lower end of the tapering casing 1. The required expansion of the gases takes place in the chamber beneath the lowermost gauze screen

10, with the result that there is no undue eddying or local action when the mixture impinges against the first screen.

Figs. 3 and 4 show a form of the device very similar to that above described, but having a throttle valve combined therewith. For this purpose the tapering casing is extended upwardly as a tubular portion 13 above the level of the top of the outer shell 2. A flange 18 on the casing fits in the top 19 of the shell 2, and is held in place by screw studs 20, as seen in plan in Fig. 4. The valve proper 15 is mounted in the tubular extension 13 by means of the pivot 16, and is adjusted in position by the arm 17. The top of the tubular extension 13 is formed with a flange at 14 to fit the corresponding flange on the inlet manifold of the engine. The atomizer in this case is shown as being shaped at the bottom to fit a carbureter having a flat top, such as the well known Zenith carbureter. It is therefore cut off flush beneath the bottom of the expanding part 3 of the shell. The use of copper or an alloy containing not less than 40% of copper for the tapering casing 1 has the advantage of giving high conductivity for heat, while copper also has a higher coefficient of expansion than the metal such as cast iron, brass or any suitable alloy which can be used for the outer shell, so that when the apparatus is hot during use the end 4 of the tapering casing 1 is pressed still more tightly against the expanding shell 3.

Fig. 5 shows the general arrangement of the vaporizer shown in Figs. 3 and 4. 21 is the carbureter on the top of which the vaporizer is fitted, and 22 is the induction pipe leading from the top of the vaporizer to the inlet valves. At 23 is an auxiliary air inlet which may be of any suitable type, whether automatic or controlled by hand. However the air is admitted to the mixture after it has passed the guaze screens, it serves to cool the gases and to dilute the strong mixture emanating from the vaporizer, down to the strength which is most suited for combustion in the engine.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. A vaporizer for use in preparing combustible mixtures for internal combustion engines, comprising a tapering casing, a plurality of gauze screens at intervals therein, an outer shell adapted to serve as a jacket around said casing, and apertures for introducing heating fluid to and withdrawing it from said jacket, said outer shell being formed with an expanding conical surface at the inlet end, and said casing being formed with an enlarged conical end which fits against said expanding conical surface in the shell, whereby a gas-tight joint is formed while an enlarged chamber is provided beneath the first gauze screen, for the purpose specified.

2. A vaporizer for use in preparing combustible mixtures for internal combustion engines, comprising a tapering casing, a plurality of gauze screens at intervals therein, an outer shell adapted to serve as a jacket around said casing, and apertures for introducing heating fluid to and withdrawing it from said jacket, said outer shell being formed with an expanding conical surface at the inlet end, and with a socket at its other end, and said casing being formed with a conical end to fit in the said expanding conical surface at the inlet end of the shell, and with a flange adapted to fit in the socket of the casing, whereby the tapering casing is fitted in a gas-tight manner in said outer shell, while an enlarged chamber is provided beneath the first gauze screen.

3. A vaporizer comprising a tapering casing with a plurality of gauze screens fitted at intervals therein, and an outer shell into which said tapering casing is fitted in a gas-tight manner, said outer shell forming a heating jacket around said tapering casing, and being formed at its lower end to fit upon the outlet of a carbureter, of an upward extension of said casing, a throttle valve therein, and a flange above the same for attachment to the induction pipe of an engine.

4. The combination of an outer shell with inlet and outlet apertures therein for a heating fluid, a tapering casing with a coned lower end adapted to fit upon a correspondingly coned surface in the outer shell, and with a flange adapted to fit the top of said outer shell, a fitting at the bottom of said outer shell adapted to be secured upon a carbureter, a plurality of gauze screens, rings holding said guaze screens at intervals in the length of the tapering casing, and means for connecting the top of said tapering casing to the induction pipe of an engine.

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