F. A. MAYERS.

KEROSENE VAPORIZER.

APPLICATION FILED JULY 5, 1917.

1,295,916. Patented Mar. 4, 1919.

Fig. 1.

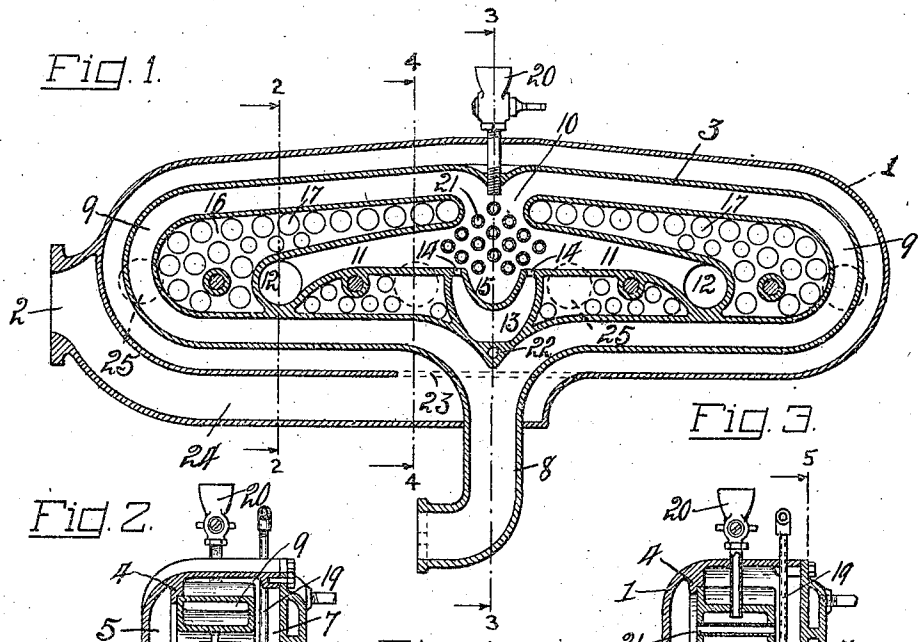


Fig. 2.

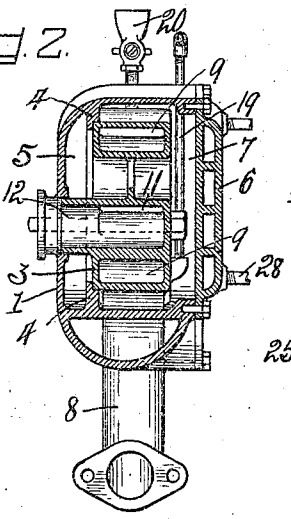


Fig. 3.

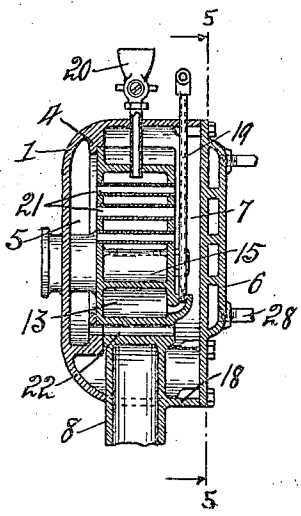


Fig. 4.

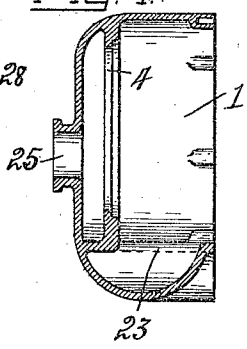
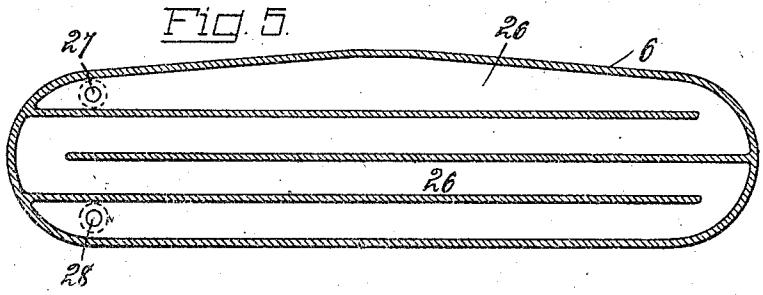


Fig. 5.



INVENTOR

Fred A. Mayers

By Owen, Owen & Crampton.

His attys.

UNITED STATES PATENT OFFICE.

FRED A. MAYERS, OF PETERSBURG, MICHIGAN.

KEROSENE-VAPORIZER.

1,295,916. Specification of Letters Patent. Patented Mar. 4, 1919.

Application filed July 5, 1917. Serial No. 178,352.

To all whom it may concern:

Be it known that I, FRED A. MAYERS, a citizen of the United States, and a resident of Petersburg, in the county of Monroe and State of Michigan, have invented a certain new and useful Kerosene-Vaporizer; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to liquid fuel vaporizing means, and particularly to means of this class adapted for use in vaporizing kerosene preparatory to burning in internal combustion engines.

The primary object of my invention is the provision of an improved vaporizing means of the class described, which is adapted to be used in connection with the customary carbureter and is operable to effect a thorough and efficient heating, breaking up and vaporizing of kerosene or similar hydrocarbon oils into a highly combustible gas efficient for use in internal combustion engines.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section of a vaporizer embodying the invention. Figs. 2 and 3 are cross-sections taken respectively on the lines 2—2 and 3—3 in Fig. 1. Fig. 4 is a cross-section of the casing of the vaporizer taken on the line 4—4 in Fig. 1, with the core member and front plate removed, and Fig. 5 is a longitudinal section taken through the front plate on the line 5—5 in Fig. 3.

Referring to the drawings, 1 designates a casing, which has one side open, as shown in Fig. 4, and is provided in one end with an exhaust outlet 2. A core member 3 forming a circuitous tube or passage for the fuel to be vaporized, is inserted into the casing 1 through the open side thereof, and seats at its rear or inner side into or against a flange 4, which extends around the rear interior portion of the casing 1 and coöperates therewith and with the core member to form a rear chamber 5 into which the hot exhaust gases from the associated engine are first introduced. The front open side of the casing 1 is closed by a plate 6, which cooperates with the casing and core member to form a front exhaust chamber 7, which has communication with the exhaust outlet 2.

The core 3 primarily comprises a circuitous tube or conduit having the entrance portion 8 at the central bottom part of the core and then dividing and extending in opposite directions around the interior of the casing 1 longitudinally thereof to form the parts 9, 9, with the ends of such divided parts meeting at the central top portion of the core and then extending down interiorly of the core at 10 and forming the oppositely extending parts or arms 11, 11, which form a mixing chamber and are disposed longitudinally of the core and have the outlets 12, 12 at their ends. These outlets extend through the rear side of the casing and are arranged to connect with the customary intake manifold openings of an engine, two of which openings are usually provided in four cylinder engines.

A steam chamber 13 is provided in the core immediately below and centrally of the mixing chamber, and communicates with the interior of the mixing chamber through openings 14 disposed at each side of a cavity or cup portion 15 disposed centrally in the bottom wall of the mixing chamber. The adjacent portions of the core tube are connected by a web 16, which is provided with a plurality of openings 17 through which the exhaust gases pass from one to the other of the chambers 5 and 7. The bottom of the casing 1 is provided with an opening, which extends inward from the outer side edge thereof and is adapted to have the stem portion 8 of the core tube project downward therethrough when the core is disposed within the casing. The part 8 partially fills the casing opening in which disposed and has a flange or lip 18 projecting from its outer side to fill the remainder of said opening, as shown in Fig. 3.

Water is supplied to the steam chamber 13 through a pipe 19, which communicates with any suitable source of supply and may have its feed automatically or manually controlled, as desired. As such control forms no part of the present invention it has not been shown. 20 designates a priming cup which is mounted over the casing 1 and has a tube extending down therefrom through

the casing top and into the central top portion of the core member 3 in register with the passage 10 therein and over the cup 15.

A plurality of tubes 21 are disposed transversely through the core member in position to pass through the mixing chamber 11 below the entrance 10 thereto and over the cup 15 so that the fuel in its passage through the core tube is required to pass around the tubes 21 in entering the said chamber from the passages 9, 9. The tubes 21 open communication between the exhaust chambers 5 and 7 so that they become highly heated by the passage of the exhaust gases therethrough, thus effecting a thorough breaking up and vaporizing of the liquid fuel coming in contact therewith. An exhaust passage 22 is also provided through the core member immediately below the steam chamber 13 and opens communication between the exhaust chambers 5 and 7.

The exhaust chamber 7 is provided with a space entirely around the core member 3 in advance of the flange 4 so that the entire surface of the core member is exposed to the exhaust gases. The exhaust gases in their passage from within the casing 1 are required to pass through an opening 23 provided in the bottom of the chamber 7 around the core part 8 and thence pass to the outlet 2 through a passage 24, which is provided longitudinally in the case 1 below the bottom of the chamber 7. The rear or closed side of the casing 1 is provided with one or more openings 25 through which the exhaust gases may be introduced to the chamber 5.

The plate 6 may be, and in the present instance, is shown as having a backwardly and forwardly extending passage 26, which is formed within said cover and has an inlet opening 27 at one end and an outlet opening 28 at its other end. The inlet opening 27 has communication with the atmosphere whereby cool air enters the passage 26 through said opening, while the outlet opening 28 has communication through a pipe 29 with the air inlet of the associated carbureter, not shown. It is thus evident that the air in its passage through the plate 6 will become highly heated by reason of the passage of the exhaust gases through the casing 1 in contact with said plate and that the carbureter during a running of the engine will be supplied with heated air when connected with the air heating passage 26.

In the use of my vaporizer it is disposed between the carbureter and engine in the place of the customary intake manifold so that the fuel mixture after leaving the carbureter is required to pass through the circuitous passage 8, 9, 10, 11 of the core member 3 and to be thoroughly vaporized and converted into a highly combustible gas by the heat to which it is subjected when traversing said passage, such heat being occasioned by the passage of the exhaust gases through the casing 1 and through and around the core member 3. The heated tubes 21 with which the fuel comes in direct contact facilitate the breaking up and vaporization thereof. The steam which is generated from water within the steam chamber 13 passes through the ports 14 into the mixing chamber formed by the passage arms 11, 11 and mixes with the vaporized fuel. It is found that the mixing of a small amount of moisture with the fuel prevents to a very large extent carbon forming in the motor cylinders. In starting a motor equipped with my vaporizer a small quantity of gasolene or other suitable priming liquid of a highly combustible nature is introduced into the cup or cavity 15 in the bottom of the mixing chamber 11 from the priming cup 20. The cup 15 is adapted to hold sufficient liquid to start the motor when cold, such starting requiring about thirty seconds to heat the vaporizer sufficiently to make a change to kerosene as the operating fuel.

It is evident that should either the casing or the core member of my vaporizer be broken, thereby necessitating repair or replacement, one may easily and quickly be removed from the other for such purpose by first removing the plate 6 and disconnecting the priming and water supply tubes from the core member.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications without departing from the spirit of the claims.

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

1. A vaporizer of the class described, comprising a casing forming an exhaust passage, and means within said casing dividing it into separate exhaust chambers one having an inlet and the other an outlet opening, said means forming a circuitous fuel passage and having passages opening communication between said chambers, a portion of which passages extend through said fuel passage.

2. A vaporizer of the class described, comprising a casing forming an exhaust passage, and means removably mounted in said casing and dividing it into separate exhaust chambers one having an inlet and the other an outlet opening, said means forming a circuitous fuel passage and having passages opening communication between said chambers, a portion of which passages extend through said fuel passage.

3. In a vaporizer of the class described, a casing forming an exhaust passage, and means mounted in said casing and forming a circuitous fuel passage with its walls exposed to exhaust gases passing through said casing, said means forming a steam chamber

in communication with a portion of said fuel passage.

4. In a vaporizer of the class described, a member forming a circuitous fuel passage and adapted to have multiple communication with a motor and communication with a source of fuel supply and forming a steam chamber, said passageway having a portion thereof forming a mixing chamber and communication with said steam chamber, and means for directing exhaust gases around and through said member.

5. In a vaporizer of the class described, a member forming a circuitous fuel passage with a part of said passage forming a mixing chamber and having a plurality of outlet openings, said member also forming a cup in the bottom of said mixing chamber and a steam chamber in communication with said mixing chamber, means for introducing a priming fluid to said cup, means for introducing water to said steam chamber, and means forming an exhaust passage and adapted to direct heated exhaust gases around and through said member.

6. In a vaporizer of the class described, a casing forming an exhaust passage, a member disposed within said casing and forming a circuitous fuel passage, and tubes extending through a portion of said passage and opening communication between different portions of the exhaust passage formed by said casing, said member also forming a steam chamber in communication with said fuel passage.

7. In a vaporizer of the class described, a casing of elongated form and having inlet and outlet openings for exhaust gases, a member disposed within said casing and forming a passage which after entering the casing divides and extends in opposite directions around the interior thereof with such divided portions meeting at the central top part of the member and then extending within the member and in opposite directions to outlet openings provided in said member, exhaust tubes passing through the central part of said member and passage, said member having a web portion connecting the passage forming portions thereof and perforated to permit the passage of exhaust gases therethrough, and means for introducing a priming fluid into the central portion of said passageway adjacent to said tubes.

8. In a vaporizer of the class described, a casing of elongated form and having inlet and outlet openings for exhaust gases, a member disposed within said casing and forming a passage which after entering the casing divides and extends in opposite directions around the interior thereof with such divided portions meeting at the central top part of the member and then extending within the member and in opposite directions to outlet openings provided in said member, exhaust tubes passing through the central part of said member and passage, said member having a web portion connecting the passage forming portions thereof and perforated to permit the passage of exhaust gases therethrough, said member also forming a steam chamber in communication with said fuel passage, and means for introducing a priming fluid into the central portion of said passageway adjacent to said tubes.

9. In a vaporizer of the class described, a casing forming an exhaust passage and having one side open, a plate closing the open side of said casing and forming a circuitous air heating passage having inlet and outlet openings, a core member removably disposed in said casing and forming a circuitous fuel passage which is heated by exhaust gases within said casing, said fuel passage having inlet and outlet openings.

In testimony whereof, I have hereunto signed my name to this specification.

FRED A. MAYERS.