

F. R. PERRY,
FUEL VAPORIZER.
APPLICATION FILED JUNE 11, 1919.

1,431,327.

Patented Oct. 10, 1922.
2 SHEETS—SHEET 1.

Fig. 1.

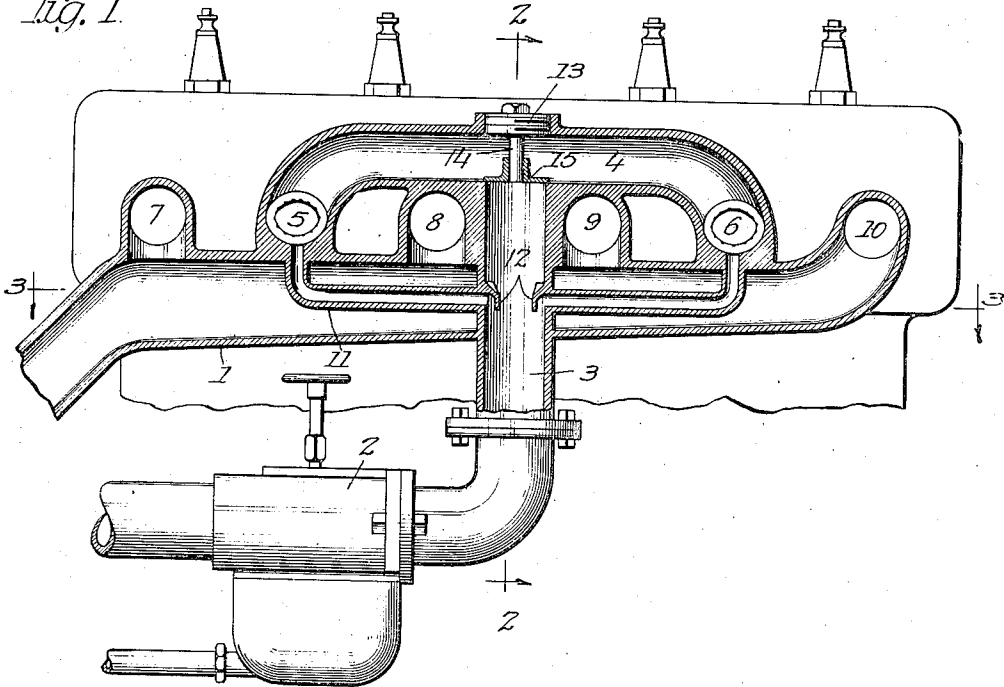
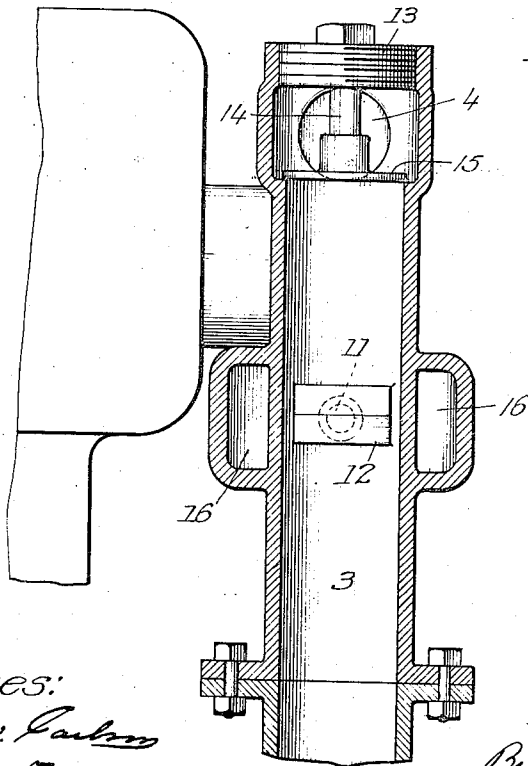


Fig. 2.



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Fig. 3.

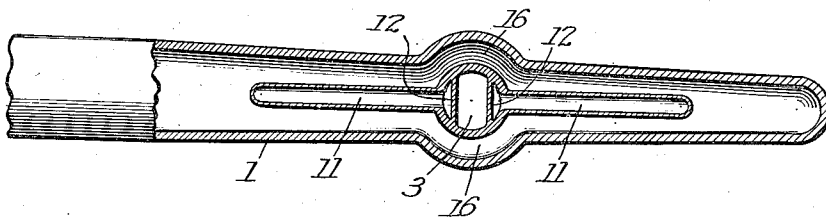
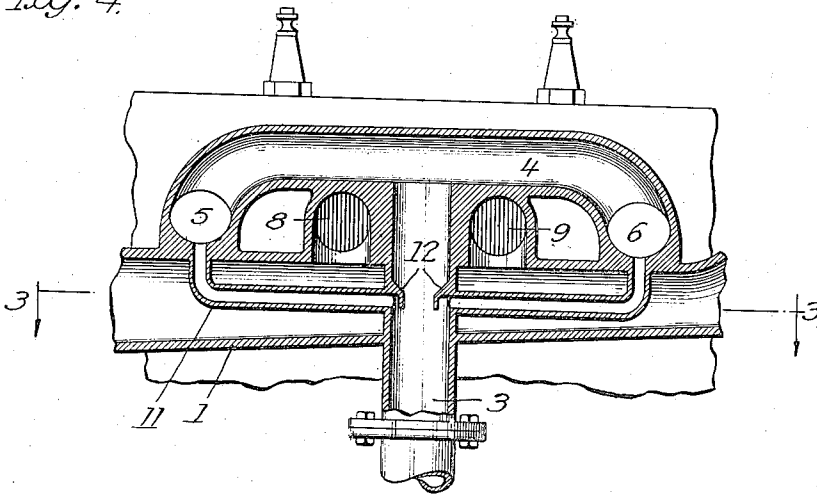


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK R. PERRY, OF DEARBORN, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BENJAMIN MOTORS PRODUCTS CO., OF DETROIT, MICHIGAN, A CORPORATION OF DELAWARE.

FUEL VAPORIZER.

Application filed June 11, 1919. Serial No. 303,431.

To all whom it may concern:

Be it known that I, FRANK R. PERRY, a citizen of the United States, residing at Dearborn, in the county of Wayne and State of Michigan, have invented certain new and useful improvements in Fuel Vaporizers, of which the following is a description.

My invention belongs to that general class of devices known as fuel vaporizers, and relates particularly to a device to be used in connection with internal combustion engines, or the like, for assisting in vaporizing the charge of fuel or hydrocarbon. The invention relates particularly to a device peculiarly adapted to be used in connection with hydrocarbon engines when the heavier hydrocarbons, such as kerosene, for example, or distillates, are used, but is not wise limited to such use. It has for its object the production of a device for the purpose stated adapted to be placed between the carburetor and the intake and exhaust ports of the engine, and that will more perfectly vaporize the passing charge on its passage from the carburetor to said ports. It also has for its object the production of such a device in a simple, efficient, durable and economical manner, and which may be available wherever such devices are applicable. To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts,

Fig. 1 is a longitudinal vertical section through a manifold illustrating my invention;

Fig. 2 is a section of the same taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a partial longitudinal horizontal section taken substantially on the line 3—3 of Fig. 1; and

Fig. 4 is a section somewhat similar to the section shown in Fig. 1, illustrating a modification.

In the drawings, 1 designates the exhaust manifold which connects with the several exhaust ports 7, 8, 9 and 10, and 5, 6 are intake ports, my improvement being shown with one of the well known types of four-cylinder engines. Leading from the carburetor 2 is a fuel passage or a pipe 3, which at its upper end communicates with a chamber or passage

4, this latter chamber or passage connecting with the intake ports, 5, 6. Arranged within the exhaust manifold 1 and heated thereby is an auxiliary passage 11 extending each side of the intake pipe 3 with which it connects, and at its ends communicating with the intake ports, 5, 6.

In the preferred construction illustrated, the auxiliary passage 11 is provided at its opening into the intake pipe 3 with depending diverting extensions or plates 12. These extend inward from the wall of the intake pipe 3 above the auxiliary passage, a suitable distance and preferably depend downward therefrom to a point substantially in line with the lower edge or wall of the said passage. Their action is to direct into the auxiliary passage that portion of the charge extending from the wall of the intake pipe inward to substantially the vertical plane of the inner ends of said extensions. In the preferred construction, I provide an opening at the top of the chamber or passage 4 and provide the same with a screw plug 13 provided with a depending stem 14, upon which is loosely maintained a vertically movable valve 15. The exhaust manifold 1 at the point where the intake pipe 3 passes therethrough is widened as at 16 so as to permit a free passage by the said pipe.

The operation as thus described is as follows: When the engine is idling or at the time of starting the same, the valve 15 is on its seat, and an incoming charge sufficient for the operation of the engine is diverted into the auxiliary passage 11, thence to the intake ports 5 and 6, and thence to the cylinders in the usual manner. As the engine is speeded up and the suction becomes greater, the supply through the auxiliary passage 11 is insufficient to supply the engine, and this insufficiency is relieved by the valve 15 being sufficiently lifted from its seat by the suction to permit a portion of the charge to pass thereby, the charge passing by said valve and through the chamber or passage 4 being also conducted to the inlet ports 5 and 6, and there brought in contact with the heated incoming charge through the auxiliary passage 11. The temperature of the latter part of the charge is greatly increased by reason of the fact that the auxiliary passage is located in the exhaust manifold 1 and heated thereby. As the engine continues to operate, the lighter

portions of the incoming hydrocarbon seek the unrestricted passage upward between the plates 12 and thence by the valve 15 and the chamber 4. The heavier liquid, which to an extent depending on the character of the hydrocarbon used tends to contact with and creep up the wall of the pipe 3, is diverted by the depending plates 12 into the auxiliary passage 11, where it is heated and thus become more perfectly vaporized. The two charges, or rather the two parts of the charge, are brought together at the intake ports 5 and 6, and thence pass onward to the cylinders of the engine very perfectly vaporized.

I have secured very satisfactory results in a device similar to that described, in which the valve 15 and its connecting parts are eliminated. Such a construction is shown in Fig. 4. In this form the construction and operation is substantially the same, except as effected by the removal of the valve shown in the previous construction. As here shown, the operation is as follows: As the engine idles or starts the charge is drawn in through the intake pipe 3 and thence a portion passes through the passage or chamber 4 and a portion through the auxiliary passage 11. The proportions will be modified somewhat by the dimensions of the various cooperating parts. As the engine speeds up to normal operation, the suction increases and the action is then substantially the same as in the form shown in Fig. 1 when the valve is wide open. For accurate operation the form shown in Fig. 1 is preferred, although for some forms of devices the form shown in Fig. 4 may be effectively used.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the kind described, and in combination, an exhaust manifold, intake ports, carbureting means, a passage communicating with the intake ports, an intake pipe communicating with said passage and the carbureting means, an auxiliary passage arranged to be heated by the exhaust manifold, and also communicating with said intake pipe and the intake ports, and means

arranged within the intake pipe for directing a part of the charge passing there-through into the auxiliary passage, said means comprising diverting plates arranged within the intake pipe above the auxiliary passage and extending downwardly therefrom within the intake pipe.

2. In a device of the kind described and in combination, an exhaust manifold, intake ports, a carbureter, a passage communicating with the intake ports, an intake pipe communicating with the passage and the carbureter, an auxiliary passage arranged within and heated by the exhaust manifold and also communicating with the intake pipe and the intake ports, said auxiliary passage extending laterally from the intake pipe intermediate the ends of the intake pipe, and means for directing a part of the charge passing through the intake pipe into the auxiliary passage, said means comprising deflecting plates extending inwardly from the walls of the intake pipe and downwardly in front of the inlet of said auxiliary passage.

3. In a device of the kind described and in combination, an exhaust manifold, intake ports, a carbureter, a passage arranged above the exhaust manifold communicating with the intake ports, an intake pipe communicating with the said passage and the carbureter, valve mechanism arranged at the connection of the intake pipe with the passage, an auxiliary passage arranged within the exhaust manifold, and also communicating with said pipe and said intake ports, and diverting plates arranged within the intake pipe above the auxiliary passage and extending downwardly therefrom within the intake pipe, whereby in starting the engine or at low speed a sufficient charge is delivered through and heated by the auxiliary passage, but upon speeding the engine up the valve will be automatically lifted from its seat, and the charge divided into two parts, one of which will pass through the first mentioned passage to the intake ports and the other of which will pass through the auxiliary passage and become heated thereby, the two parts being brought together again before the charge is delivered to the cylinders.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FRANK R. PERRY.

Witnesses:

BYRON BLOOMGARDEN,
EDWARD L. SCHAUMAN.