G. L. FOGLER.

EXPLOSIVE ENGINE.

APPLICATION FILED MAR. 30, 1909.

975,406.

Patented Nov. 15, 1910.

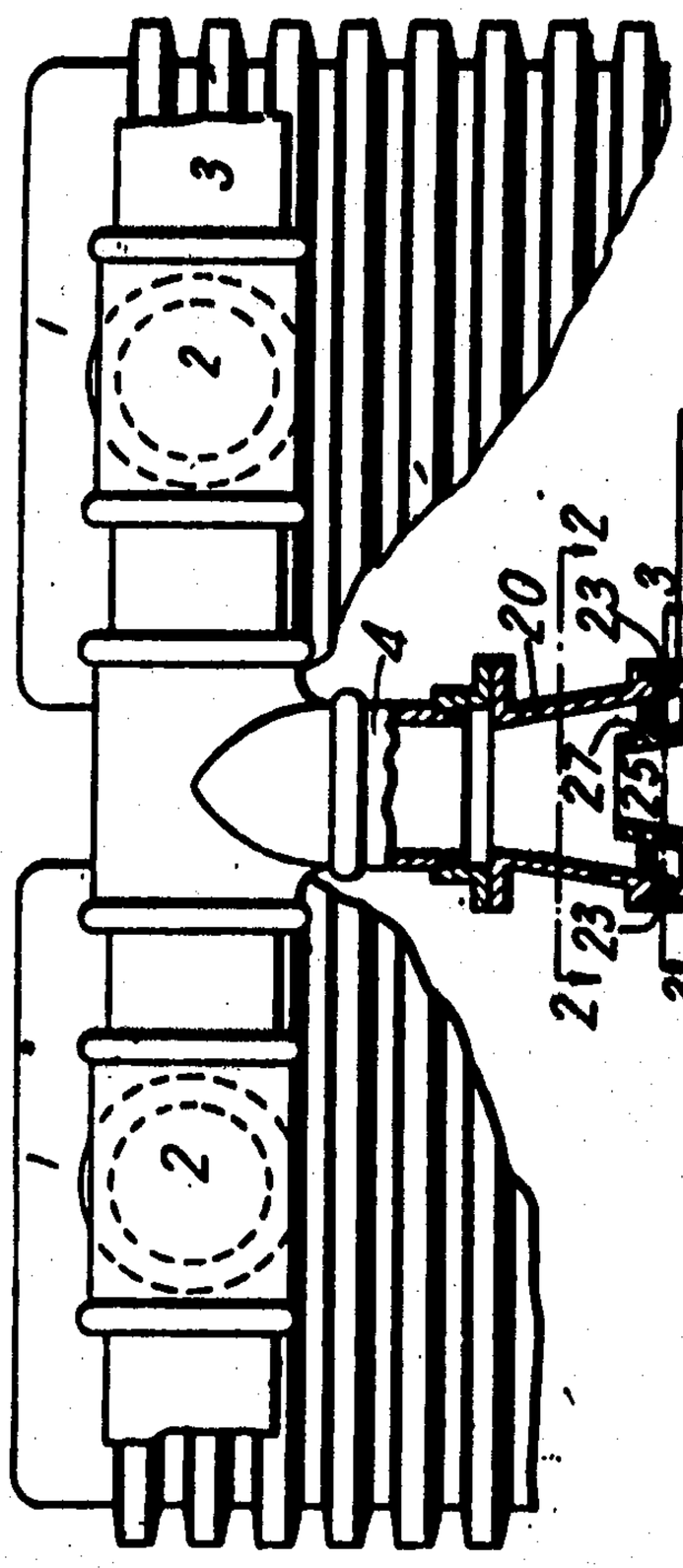

FIG. 1

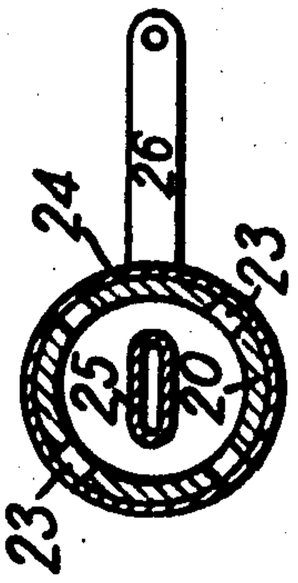

FIG. 3

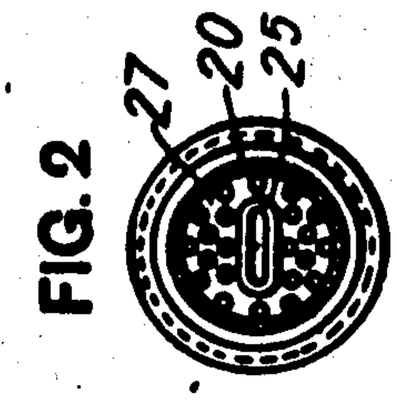

FIG. 2

WITNESSES

Chas. Isserman

Marie Draper.

INVENTOR

George L. Fogler.

By Fred'k W. Hunley,

Attorney.

UNITED STATES PATENT OFFICE.

GEORGE L. FOGLER, OF BALTIMORE, MARYLAND.

EXPLOSIVE-ENGINE.

975,406. Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed March 29, 1909. Serial No. 486,398.

To all whom it may concern:

Be it known that I, GEORGE L. FOGLER, a resident of Baltimore, in the State of Maryland, have invented a new and useful Improvement in Explosive-Engines, of which the following is a specification.

This invention relates to explosive engines, and more particularly to so called gasolene or oil engines.

The object is to very greatly increase the efficiency of such engines, to secure greater speed and power for a given quantity of fuel.

The essential feature of the invention consists in mixing air with the gas between the vaporizer or carbureter and the engine cylinders to produce a lean and homogeneous mixture.

In the accompanying drawings Figure 1 is a sectional view through the carbureter and mixer showing the upper portion of two cylinders in elevation; Fig. 2 is a cross-section on the line 2—2, Fig. 1; and Fig. 3 is a similar view on the line 3—3, Fig. 1.

In the drawings the cylinders of the engine are indicated at 1. These are or may be of the usual or any desired construction and in the drawings no attempt has been made to illustrate the same except in relation with the supply pipe. These cylinders are provided with inlet ports 2 which may be controlled by valves in the usual way and which inlet ports communicate with the fuel supply pipe. Any number of such cylinders may be connected to a manifold 3 having a connection 4 through which the fuel enters.

The carbureter or vaporizer is shown at 5. This may be of any desired form or type. That shown in the drawings is one of many forms of carbureters on the market and has been selected merely for purposes of illustration since it is sufficient for the present invention to use any kind of carbureter or vaporizer which will convert gasolene or other oil into a rich gas. The carbureter illustrated has a reservoir 6 to which the supply pipe is connected at 7 and having in said reservoir a float 8 to which is connected a valve 9 for controlling the supply inlet and regulating the height of oil in said reservoir. Leading from the reservoir is a passage 10 which is controlled by needle valve 11 and leads to the drip pipe 12 provided with a small opening 13 through which the gasolene slowly escapes. This opening is located in chamber 14 which opens at its lower end at 15 to the atmosphere and is provided on one side with the outlet 16, so that the air flowing in through the opening 15 vaporizes the oil escaping from the drip opening 13 and forms the gas which passes out at 16. The needle valve 11 is shown provided with an arm 17 by means of which said valve can be turned to regulate the quantity of oil passing through the carbureter.

The outlet opening 16 of the carbureter is connected by pipe section 18 to the mixer. This mixer comprises a suitable casing 20, preferably of tapering form as shown, having its upper and smaller end connected to the supply opening 4 leading to the engine cylinders, and having the pipe 18 communicating with an opening 21 through its bottom or larger end. The casing 20 near its bottom is provided with air openings 23 which are controlled and regulated by valve 24 in the form of a ring surrounding the casing and provided with an arm 26 for operating the same. Projecting up into the mixer beyond the air openings 23 is a nozzle 25, which communicates with the opening 21 through the bottom of the mixer and which preferably is tapered as shown in Fig. 1 and oblong in cross section as shown in Figs. 2 and 3 forming a narrow slot through which the gas from the carbureter passes. Surrounding the nozzle 25, below its upper end and above the air openings 23 is a perforated plate 27 through which the air entering the mixer must pass and which serves to break the air into small streams.

In the practical operation of the invention air valve 24 and oil valve 11 are independently operated, it being necessary that the air valve under most conditions remain entirely open, while the oil may be cut off more or less as desired. The air opening 15 in the carbureter will be of a fixed definite size so as to admit just sufficient air to vaporize the oil and form a rich gas. This gas passes up through the nozzle 25 and is then mixed with the air coming up through perforated plate 27. The suction of the engine piston draws in the air through plate 27 and the siphonic action of such air flow draws in a proportionate amount of gas through nozzle 25. The flow of this gas through nozzle 25 produces suction or siphonic action in the carbureter drawing air through opening 15 and vaporizing the oil. The gas produced in the carbureter is a rich gas and in the

mixer is mixed with a large quantity of air to produce a lean gas. As is well known, the leaner the gas the greater is the force of the explosion, providing sufficient compression can be obtained.

Heretofore in the operation of gas and gasolene engines it has been supposed that the admission of air into the supply pipe between the carbureter and the cylinder was detrimental to the proper action of the engine, as it has been found that any leakage in the supply pipe usually resulted in improper action of the engine or an entire stoppage thereof. This undoubtedly is due to the fact that the air entering said leak does not fully mingle with the gas to produce a uniform homogeneous mixture. Consequently no air has ever been admitted between the carbureter and the engine and the entire air supply has been drawn through the carbureter. In the carbureter, however, the oil must be vaporized and there is not produced a uniform and homogeneous mixture, on account of which the action of the engine is found to be erratic and unequal, the cylinder failing to produce an explosion at each stroke. The failure of explosions in the cylinder at each stroke, or "missing," as it is termed, is undoubtedly due to the nonuniformity of the gas mixture entering the cylinder. Such mixture under the old methods may be termed "lumpy," instead of being a homogeneous and intimate blend of the air and gas.

According to my invention, only sufficient air is admitted in the carbureter to vaporize the oil, so producing a rich gas and which practically has no pressure and is drawn into the mixer by the siphonic action of the air entering the latter. The gas entering the mixing chamber is entirely surrounded by incoming air, which is broken up into small streams or jets, giving the gas an opportunity to mix in with the same and produce an intimate homogeneous mixture. This enables the formation of a very lean gas of homogeneous quality. Actual tests have shown that when the air openings of the air and gas mixer are closed the engine develops only a limited speed and power, but without any alteration of the oil valve the mere opening of the air ports to the mixing chamber immediately produces a remarkably great increase in speed as well as power, thereby greatly increasing the efficiency of the engine without increasing the quantity of fuel.

What I claim is:

The combination with an explosive engine cylinder, of a vaporizer or carbureter, connections therefrom to the engine cylinder, and a mixer in said connections comprising a chamber having one end connected to the engine cylinder and provided with air openings in its other end, a nozzle connected to the vaporizer and projecting into the mixing chamber beyond the air openings, and a perforated plate between said nozzle and chamber walls in advance of the air openings.

In testimony whereof, I have hereunto set my hand.

GEORGE L. FOGLER.

Witnesses:
H. DIAMOND,
F. W. WINTER.