Feb. 10. 1925. 1,525,621

S. T. SCHAVIAK

FUEL MIXER

Filed June 29, 1923

Fig. 1.

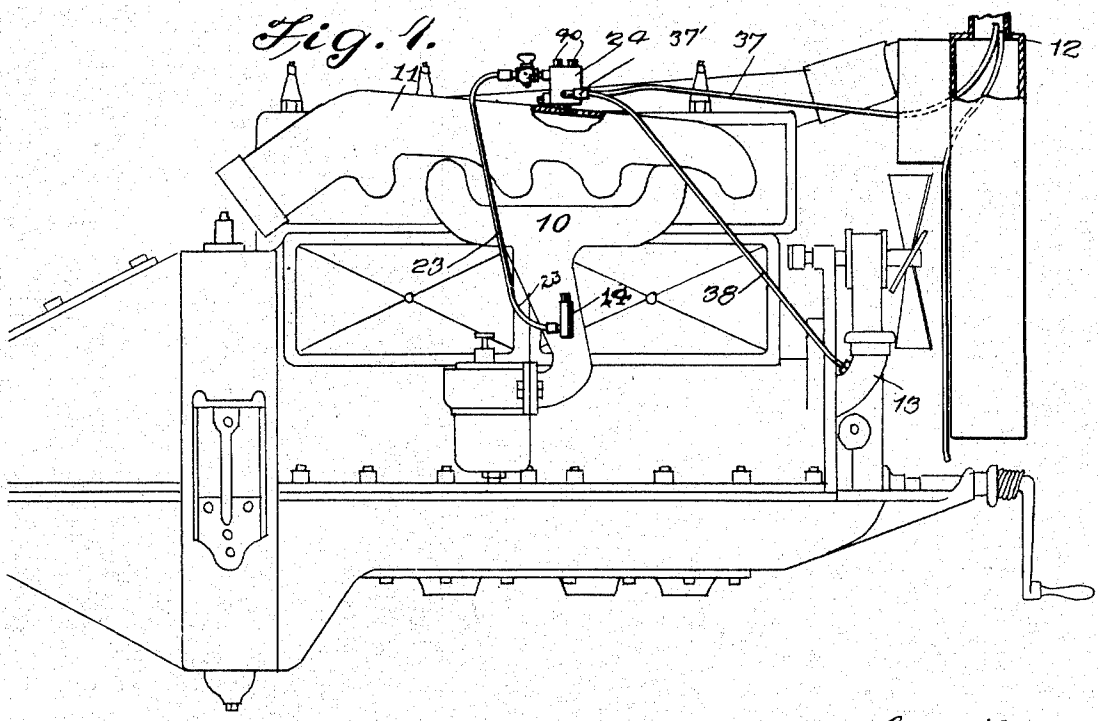


Fig. 3.

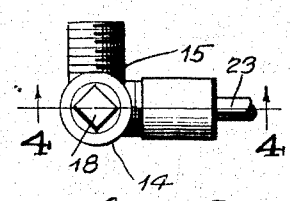


Fig. 2.

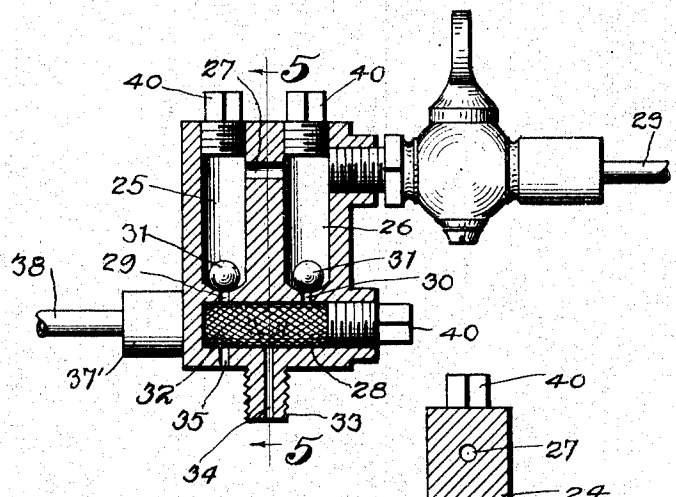


Fig. 4.

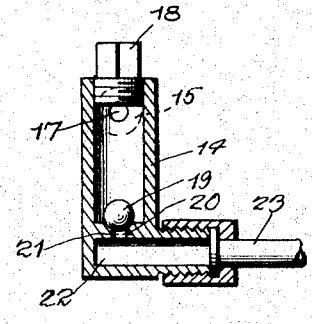
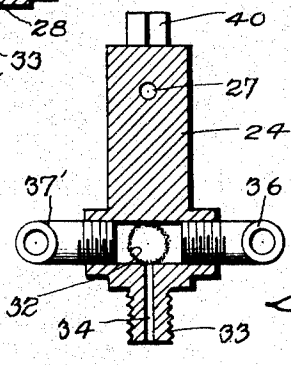


Fig. 5.



Inventor

Stephen T. Schaviak

Banks & Ashman

Attorneys

Patented Feb. 10, 1925. 1,525,621

UNITED STATES PATENT OFFICE.

STEPHEN T. SCHAVIAK, OF MICHIGAN CITY, INDIANA.

FUEL MIXER.

Application filed June 29, 1923. Serial No. 648,521.

To all whom it may concern:

Be it known that I, STEPHEN T. SCHAVIAK, a citizen of the United States of America, and resident of Michigan City, in the county of La Porte and State of Indiana, have invented certain new and useful Improvements in Fuel Mixers, of which the following is a specification.

This invention relates to fuel mixers and enrichers for internal combustion engines, and has for an object the provision of novel means whereby moisture, heat and residue of gases in the crank case of an internal combustion motor may be commingled and delivered to carbureted fuel in its passage to the cylinder or cylinders of an internal combustion motor.

It is a further object of this invention to produce a device of the character indicated which will operate proportional to the suction of the motor, the said device remaining inactive when the motor is being started, and automatically thrown into action as the motor increases its R. P. M.

It is a further object of this invention to produce a device of the character indicated connected with an exhaust pipe or an exhaust manifold of the motor and in communication with the radiator above the water line and the crank case above the oil level; the said device having a mixing chamber in which the products from the crank case, the exhaust pipe and the radiator are commingled prior to their delivery to the fuel pipe or intake manifold of the motor.

It is a still further object of this invention to produce a device preferably in which a plurality of ports are guarded to be opened successively as the motor speeds up in its operation; the said device also having an air inlet which may, under certain conditions of use, constitute a drain port, as will presently appear.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a view in elevation of a conventional motor, showing a device embodying the invention applied thereto;

Figure 2 illustrates a sectional view of the mixing chamber;

Figure 3 illustrates a plan view of the mixer adapted to be connected to an intake manifold;

Figure 4 illustrates a sectional view on the line 4—4 of Fig. 3; and

Figure 5 illustrates a sectional view of that part of the device shown in Fig. 2 on the line 5—5 of said Fig. 2.

In these drawings, 10 denotes a conventional type of intake manifold, 11 a conventional type of exhaust manifold, 12 a radiator and 13 a breather pipe in communication with the crank case.

A device embodying the invention comprises a housing or casing 14 having preferably a threaded nipple 15 which is adapted to be tapped in the wall of an intake manifold to communicate with the interior thereof through the aperture 17 located near the upper end of the said casing. The casing may have a threaded plug 18 in its upper end and through which a ball valve 19 may be inserted which normally rests on the seat 20 to close the port 21 leading to the upper chamber of the casing. There is a lower chamber 22 of the casing to which the pipe 23 is connected, and the said pipe 23 leads from the mixing chamber 24 to which air, vapor, gas and exhaust or products of combustion are delivered prior to being introduced into the intake manifold through the pipe 23 and casing 14.

The casing 14 has two vertically disposed chambers 25 and 26 connected together near their upper ends by a port 27. The chambers 25 and 26 are in communication with a horizontally disposed chamber 28 at the bottom of the casing through ports 29 and 30 respectively. Valves such as 31 are provided in the chambers and they guard the ports 29 and 30 and operate to close the ports until the suction of the motor overcomes the gravity of the valves. Under normal operation, the valve in the chamber 26 will open first and thereafter the valve in the chamber 25 will open as the suction increases. There is a cylindrical screen 32 in the chamber 28 which prevents foreign substances from entering the chambers.

The casing has a threaded nipple 33 that may be tapped into the exhaust manifold or line, and this nipple has a port 34 there-

in which communicates with the chamber 28 to allow a certain amount of exhaust to enter the chamber 28 to be mixed with vapor, air and gas, as will presently appear. The lower part of the casing also has an air inlet port 35 that communicates with the chamber, and this port 35 will also act as a drain, should there be an excess of moisture reach the interior of the mixing chambers through an overflow of the radiator or the like.

The casing 14 has a suitable coupling 36 for a pipe 37 which communicates with the interior of the radiator 12 and a coupling 37′ for a pipe 38 communicates with the interior of the breather tube 13.

The pipe 23 communicates with the chamber 26 through means of the valve 25 which may be opened or closed, according to the requirements. When the valve is open, the device will operate in the manner heretofore stated, whereas if the valve is closed, it will interrupt the operation of the mixing device, and a demonstrator may compare the results and operation of the motor augmented by a device of the invention, or where it is running without the aid of the invention.

Suitable plugs such as 40 may be tapped into the several chambers to close the same, but the inventor does not wish to be limited with respect to the employment of plugs of the character shown.

When the device is installed on a motor in the manner illustrated in Fig. 1, the ball valve 19 will be seated until the motor has acquired a momentum which would operate the automobile at about ten miles per hour. When the motor is thus running, the arrangement is such that the suction will unseat the valve 19, permitting it to draw through the pipe 23 to the chamber 26. When the suction is sufficient to raise the valve in the chamber 26, vapor will be drawn from the radiator; gas will be drawn from the crank case; air will be drawn from the atmosphere, through the port 35 and exhaust gases will be drawn through the port in the nipple and into the chamber 28 where it will be commingled and find its way through the port 30 to the chamber 26 and to the intake manifold through the casing 14, as will be understood, and as the R. P. M. increases, the suction will overcome the gravity of the valve in the chamber 25 so that greater quantities of the mixture will reach the intake manifold through the same channels.

I claim:

In a mixer for fuel of internal combustion motors, a casing having an apertured nipple to communicate with the interior of an exhaust conductor, a chamber in the casing with which the nipple communicates, chambers in the casing in communication with the first mentioned chamber, the second mentioned chambers being in communication with each other, said casing having an air duct to the first mentioned chamber, check valves controlling passages from the first to the second mentioned chambers, a screen in the first mentioned chamber, vapor conducting pipes communicating with the first mentioned chamber, a pipe communicating with the interior of the crank case of the motor and with the first mentioned chamber, whereby air and vapors delivered to the second mentioned chambers pass through the first mentioned chamber and the screen therein, and means of communication between the second mentioned chambers and a fuel feed to the motor, substantially as described.

STEPHEN T. SCHAVIAK.