Sept. 16, 1924. 1,509,017

L. W. MILLER ET AL

FUEL ECONOMIZER FOR EXPLOSIVE ENGINES

Filed June 22, 1922

FIG. 1.

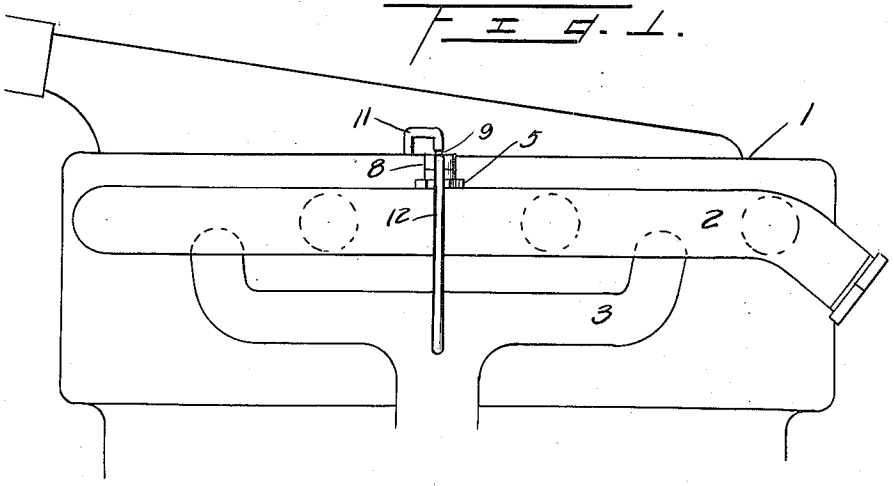
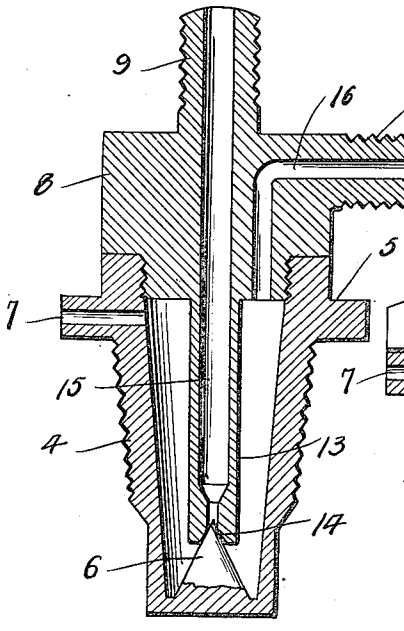


FIG. 2.



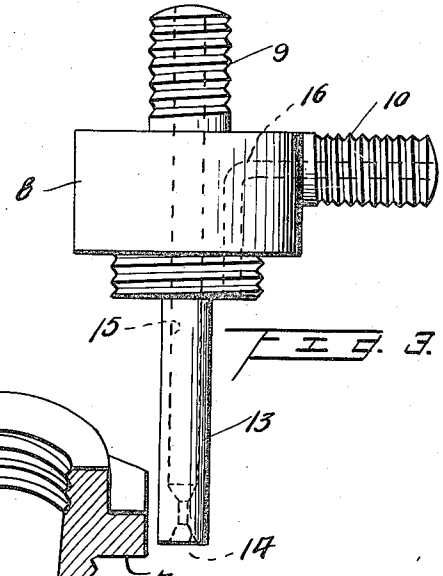


FIG. 3.

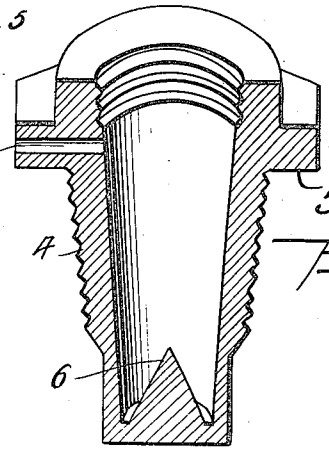


FIG. 4.

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Patented Sept. 16, 1924. 1,509,017

UNITED STATES PATENT OFFICE.

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FUEL ECONOMIZER FOR EXPLOSIVE ENGINES.

Application filed June 22, 1922. Serial No. 570,149.

To all whom it may concern:

Be it known that we, LLOYD W. MILLER and IRVIN C. DUVALL, citizens of the United States, residing at Bessemer, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Fuel Economizers for Explosive Engines; and we 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.

The primary intent of the present invention is the provision of a device whereby air and vapor may be supplied to the gaseous mixture in the operation of an internal combustion engine whereby to save fuel, prevent overheating of the engine, obviate fouling of the engine and valves, insure an increase of power and to enable a saving of oil for lubricating the engine, as well as to enable the gas to be completely shut off when coasting or the engine operated by the momentum of the car.

Other objects and advantages will be apparent and suggest themselves as the nature of the invention is understood.

While the drawings illustrate an embodiment of the invention it is to be understood that in adapting the same to meet different conditions and requirements, various changes in the form, proportion and minor details of construction may be resorted to without departing from the nature of the invention.

Referring to the accompanying drawings forming a part of the application,

Figure 1 is a detail view illustrating the application of the invention,

Figure 2 is a sectional detail of the device, showing the parts on a larger scale,

Figure 3 is an elevation of the coupling head, the dotted lines showing the passages therethrough, and

Figure 4 is a sectional perspective of the shell or body.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The numeral 1 designates the usual water head of an internal combustion engine, 2 the exhaust pipe or manifold and 3 the intake manifold. These parts may be of any well known construction and arrangement and are illustrated to demonstrate the application of the invention.

The device comprises a body or shell 4 having an outer enlargement 5 at its upper end of polygonal form to receive a wrench or spanner. The shell 4 is externally screw threaded to make connection with the exhaust pipe or manifold 2 by being screwed into an opening tapped therein. A needle valve 6 extends upwardly from the lower closed end of the shell and preferably forms a part thereof. A lateral opening 7 is formed in the enlarged portion 5 of the shell and constitutes an inlet for the air.

A head 8 is coupled to the upper end of the shell 4 by means of a screw thread joint and is formed with coupling ends 9 and 10 to which pipes 11 and 12 are attached, the pipe 11 being coupled to the water head 1 and the pipe 12 to the intake manifold 3. A hollow stem 13 projects from the lower end of the head and the opening formed therein is flared at its lower end as indicated at 14 to form a seat to receive the valve 6. An opening 15 extends through the head 8, coupling end 9 and stem 13 and forms a passage for water from the water head 1 to the shell or body 4. An opening 16 extends through the coupling end 10 and head 8 and provides a passage for the outflow of air and vapor from the shell 4 to the intake manifold 3. The passages 15 and 16 are independent of each other. The parts 4 and 8 comprising the device may be constructed of aluminum, copper or other metal having good heat conductivity and great expansion.

In practice, the device is fitted to the exhaust pipe or manifold of an internal combustion engine and the end 9 is connected by means of the pipe 11 with the water head of the engine and the end 10 with the intake manifold by means of a pipe 12. The parts are so adjusted that the passage 15 is normally closed by means of the valve 6. After the engine has been running some little time, the shell or body 4 becomes heated and expands with the result that the valve 6 is unseated and water from the water head or jacket of the engine flows through the passage 15 into the shell 4 and is converted into vapor by the heat thereof and mixes with air entering the inlet 7, the mixture of air and vapor passing from the shell 4 through the passage 16 and pipe 12 to the intake manifold and mixing with the gas prior to its admission into the engine. The head 8 and stem 13 are relatively cooler than the shell or body 4 by reason

of the water passing therethrough, hence the shell or body is subjected to a greater expansion which results in the unseating of the valve 6. When the device cools, the parts contract and seat the valve 6, thereby cutting off the supply of water to the shell or body 4. It will thus be understood that the device is automatic in operation, the valve 6 opening when the engine is running and closing when the engine is at rest.

It is not essential that the head 8 be constructed of metal having great expansion. However it is of the utmost importance that the shell 4 consist of metal capable of great expansion when heated in order to unseal the valve 6 so that water may be supplied to the body.

It will of course be understood that the amount of valve opening at 14 is very small, just sufficient to admit an amount of water that will be taken care of by the engine.

What is claimed is:

1. An engine humidifying device of the character specified comprising a shell having an air inlet and provided in its lower portion with a valve member, and a head closing the upper end of the shell and formed with inflow and outflow passages, and having a tubular stem extending into the shell and normally closed by the said valve member, the latter being automatically unseated by unequal expansion of the parts when the device is in operation.

2. A device of the character specified for supplying moisture to the charge of an internal combustion engine, the same comprising a body or shell adapted to be secured in place on the engine and have the exhaust gases thereof contact with the outer sides of the shell, said shell or body having its lower end closed, a valve member at the lower end of said shell and extending vertically therein, said shell having an air inlet adjacent its upper end, a head closing the upper end of the shell and formed with independent inflow and outflow passages communicating with the interior of the shell, said head having a tubular stem forming a continuation of the inflow opening and extending into the shell and normally closed by the said valve member, said inflow passage adapted to have connection with the water jacket of the engine whereby the said tube is normally filled with water when the device is in operative position on an engine, said outflow passage adapted to have connection with the intake manifold of the engine, and said valve member being automatically unseated by unequal expansion of the parts when the engine is in operation.

3. A device of the character specified for supplying moisture to the charge of an internal combustion engine, the same comprising a shell having a portion of its exterior screw theaded for threading into the exhaust pipe of an engine, said shell having an air inlet adjacent its upper end, a valve member in the lower end of said shell, a head threaded into the upper end of said shell, one of said members having a shoulder adapted to abut the edge of the other of said members to prevent the head being threaded into the shell for a distance sufficient to close the air inlet, said head having inflow and outflow passages communicating with the interior of said shell, a tubular stem on said head and extending into said shell and forming a continuation of the inflow passage and normally closed by said valve member, and the valve member being automatically unseated by unequal expansion of the device when subject to the head of the exhaust gases of the engine.

4. A device of the character specified for supplying moisture to the charge of an internal combustion engine, the same comprising a body adapted to be threaded into the exhaust pipe of the engine, a valve within the lower end of said body, and a head closing the upper end of the body and provided with independent inflow and outflow passages, the inflow passage being normally closed by said valve and the latter being automatically unseated by unequal expansion of the device when subject to the heat of the exhaust gases of the engine.

In testimony whereof we affix our signatures in presence of two witnesses.

LLOYD W. MILLER.
IRVIN C. DUVALL.

Witnesses:
T. W. HENRY,
C. E. ANDERSON.