O. E. AND E. D. BURROUGHS.

COMBINED GAS SAVER AND PRIMER FOR AUTOMOBILES.

APPLICATION FILED MAY 3, 1918.

1,324,299. Patented Dec. 9, 1919

Fig. 1.

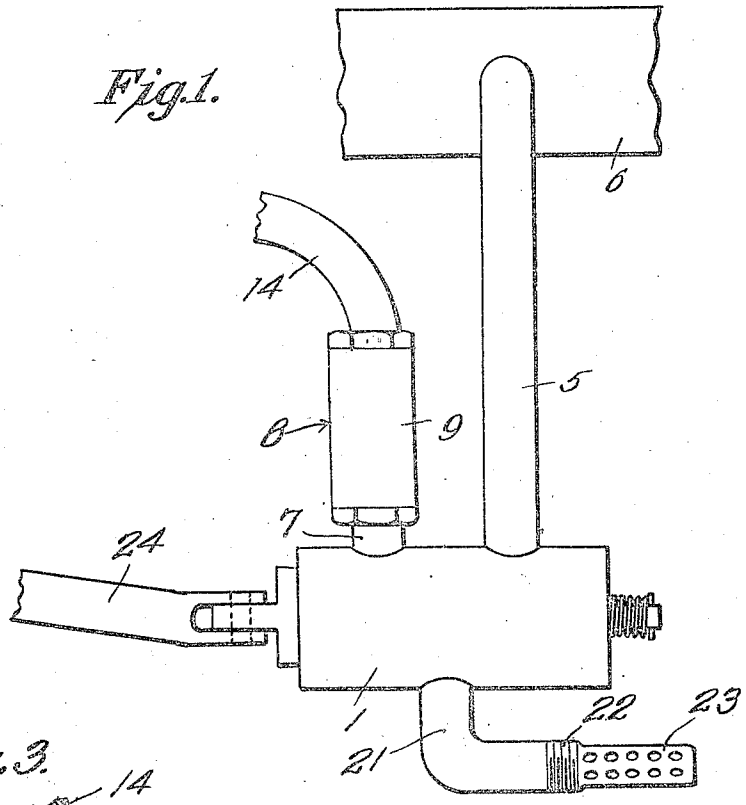


Fig. 3.

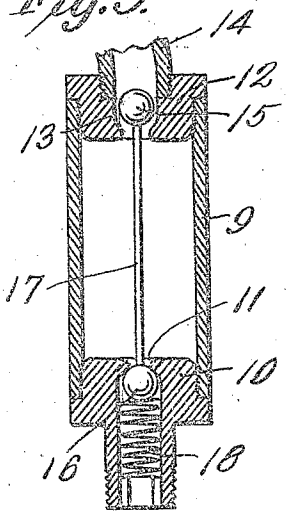
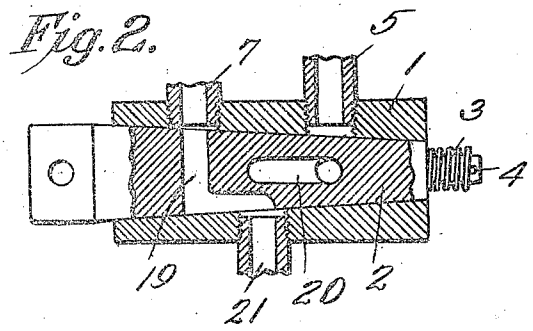


Fig. 2.



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COMBINED GAS-SAVER AND PRIMER FOR AUTOMOBILES.

1,324,299. Specification of Letters Patent. Patented Dec. 9, 1919.

Application filed May 8, 1918. Serial No. 233,383.

To all whom it may concern:

Be it known that we, ORA E. BURROUGHS and ELGIE D. BURROUGHS, citizens of the United States, residing at Argos, in the county of Marshall and State of Indiana, have invented certain new and useful Improvements in Combined Gas-Savers and Primers for Automobiles, of which the following is a specification.

This invention relates to a combined gas saver and primer for automobiles.

The object of the invention is to provide a device operable by a single lever from the dash of a car to supply a priming mixture and also hot air from the exhaust manifold to the intake manifold of the engine, whereby the motor may be easily started and a saving in gas effected.

Another object is to provide improved means for automatically controlling the priming charge operable by the vacuum of the engine.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 represents a side elevation of the device constituting this invention with parts broken out,

Fig. 2 is a longitudinal section through the valve, and

Fig. 3 is a vertical section through the priming charge controlling device.

The preferred form of the invention illustrated herein comprises a valve casing 1 having a tapered valve plug 2 therein which extends through the casing and has a coiled spring 3 bearing against one end of the casing and a pin 4 extended through the projecting end of the valve so as to hold the valve normally in connection with its casing as is shown clearly in Figs. 1 and 2.

Leading from the valve casing 1 is a pipe 5 connected at its other end with a shell-like member 6 which is designed to fit over the exhaust manifold of an internal combustion engine and to be clamped or secured thereto in any desired manner. This casing 6 collects the hot air from the exhaust manifold and passes it through pipe 5 to the valve casing 1 for a purpose presently to be described.

Another pipe 7 opens through one side of the valve casing 1, being here shown with longitudinal alinement in the opening in which pipe 5 is mounted. This pipe 7 is detachably mounted in the valve casing 1 and carries at its upper end a priming charge controlling device 8 here shown in the form of a cylindrical container 9 having a plug 10 detachably connected on its lower end and carried by pipe 7, said plug having a valve seat 11 therein. Another plug 12 closes the other end of the cylinder 9 and has a valve seat 13 with a pipe 14 leading therefrom and adapted to be connected with a fuel supply opening, not shown.

A pair of ball valves 15 and 16 are mounted in the closures 10 and 14 and open in opposite directions, being connected by a stem 17. A coiled spring 18 is mounted in pipe 7 and operates to hold the valve 16 normally in closed position and the valve 15 open so that the fuel, preferably gasolene of a high grade, may flow thereinto through pipe 14 from the supply tank. When the valve 16 is opened by suction from the engine against the tension of spring 18, the valve 15 is closed thereby cutting off communication between the cylinder 9 and the tank and permitting the contents of said container to pass out through pipe 7 and through valve 2 to the intake manifold, not shown, when the valve 2 is properly turned to bring the pipe 7 into communication with the passage 19 formed therein and which is here shown L-shaped (see Fig. 2).

The valve 2 has another L-shaped passage 20 arranged at right angles to the passage 19 and which is designed to be brought into communication with the pipe 5 on the turning of the valve 2 in the proper direction, the two passages 19 and 20 being so disposed that when one of these pipes is opened the other is closed. These passages 19 and 20 are designed to alternately communicate with an L-shaped pipe 21 which leads from the valve casing 1 at the side diametrically opposite and intermediate the space between the points where the pipes 5 and 7 enter. This pipe 21 is designed to be screwed into the intake manifold of an internal combustion engine, threads 22 being here shown for such connection. The free end of this pipe 21 has an apertured extension 23 ar-

ranged beyond the threads 22 which is designed to extend into the intake manifold for the passage of the combined air and gas and operates to spray or break up the fuel particles to facilitate their volatilization.

The larger end of valve 2 is connected with a lever 24, being here shown pivoted thereto to hold against turning in relation to the lever. This lever 24 extends to any suitable point convenient for operation by the driver of a car and is designed to be turned for turning the valve 2 in the casing 1, to bring either the passage 19 or 20 into operative relation to connect its coöperating pipe with the pipe 21, when desired.

From the above description it will be obvious that when the lever 24 is turned to bring the passage 19 into the position shown in Fig. 2, communication will be afforded between pipe 7 leading from the priming device to the pipe 21 leading to the manifold. When this valve 2 is so positioned, the turning over of the motor will produce a vacuum in the engine causing suction through the intake manifold, pipe 21, passage 19 and pipe 7. This suction will operate to open valve 16 against the tension of its spring 18 and close valve 15. When this occurs, the charge contained in the cylinder 9 will flow out through pipe 7, passage 19, and pipe 21 into the manifold, being broken up and sprayed as it passes through the perforated extensions 23 of the said pipe 21. After the engine has been started, the valve 2 is turned through the lever 24 to cut off the communication between passage 19 and pipe 7, and if desired, the valve 2 may be turned to position passage 20 so that it will be brought into communication with pipe 5 and pipe 21. When the parts are so disposed the hot air collected in the casing 6 will be drawn through pipe 5 into the manifold and operate to combine with the fuel to rarefy it and operate as a gas saver in a well known manner.

From the above it will be seen that the priming and gas saving devices constituting this invention are both operated and controlled by the same lever from a point convenient to the driver and that the amount of the priming charge is automatically regulated after the priming valve is opened from the dash. Furthermore, the charge is drawn into the intake manifold by the vacuum of the engine and not forced into as is the manner in devices of this character ordinarily employed.

It is of course to be understood that this device may be constructed to fit the different manifolds of various cars and that it is not limited for use in connection with any particular car.

The foregoing description and the drawings have reference to what may be considered the preferred or approved form of our invention. It is to be understood that we may make such changes in construction and arrangement and combination of parts, materials, dimensions, *et al.*, as may prove expedient and fall within the scope of the claimed invention.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is:—

In a device of the class described, the combination of a valve casing having a bore tapering toward one end with two longitudinally spaced openings in one side wall, and another in the opposed wall at a point opposite the middle of the space between said first-mentioned openings, a tapered plug valve extending through said bore and provided with a reduced extension at its smaller end projecting beyond said casing, a coiled spring on said extension to hold the valve in close contact with the casing, a pipe leading from one of said first-mentioned openings and equipped with a hot air collector, another pipe opening into the other of said first-mentioned openings and provided with an automatically controlled priming device, a pipe leading from said intermediately disposed opposed opening and adapted to be connected with an engine manifold, said valve having L-shaped passages extending transversely therethrough, and at right angles to each other, said passages being arranged to alternately bring the priming pipe and the hot air pipe into communication with the manifold connecting pipe.

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

ORA E. BURROUGHS.
ELGIE D. BURROUGHS.

Witnesses:
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