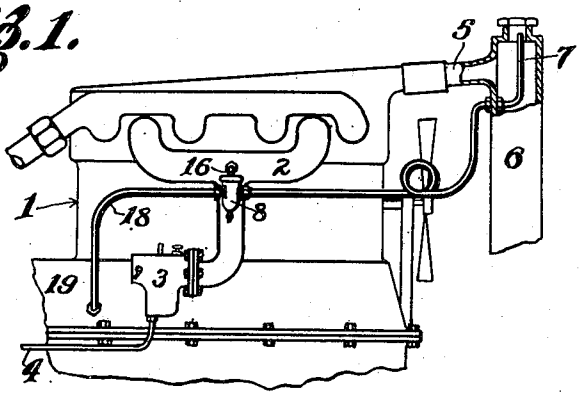
Nov. 27, 1923. 1,475,920

C. POHL

HUMIDIFIER

Filed March 8, 1921

Fig. 1.



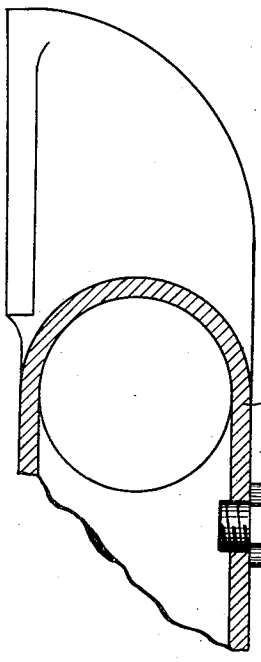


Fig. 2.

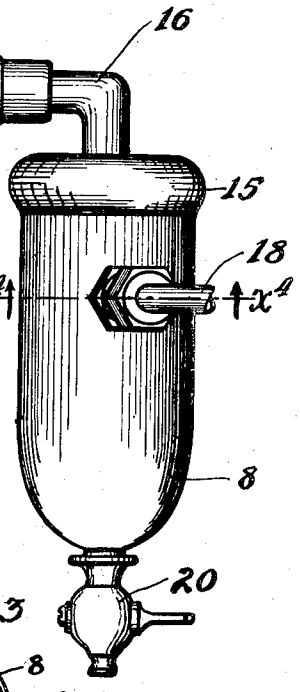


Fig. 3.

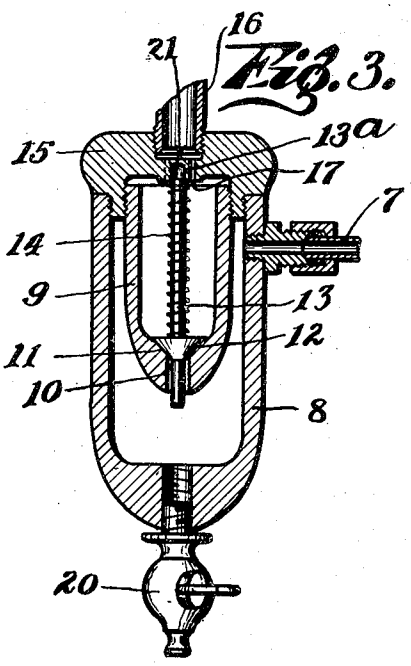
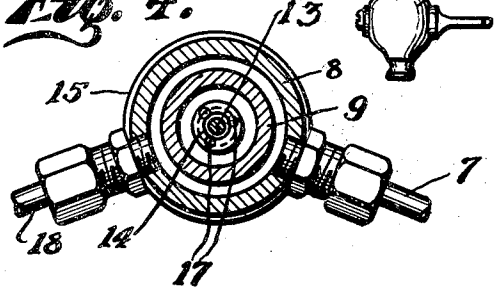


Fig. 4.



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5794

Patented Nov. 27, 1923. 1,475,920

UNITED STATES PATENT OFFICE.

CHARLES POHL, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO JOHN O. KING, OF LOS ANGELES, CALIFORNIA.

HUMIDIFIER.

Application filed March 8, 1921. Serial No. 450,618.

To all whom it may concern:

Be it known that I, CHARLES POHL, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Humidifiers, of which the following is a specification.

This invention relates to a device for introducing steam or watery vapor into the manifold of an internal combustion engine. The invention also relates to a device capable of functioning to mix air, watery vapor and fuel vapor and introducing the mixture into the manifold of the engine.

An object of the invention is to introduce watery vapor into the engine cylinders without introducing particles of water. It is not new to introduce watery vapor into the manifold between the engine and the carbureter, but with the old devices, some particles of water are introduced into the manifold and these particles are either carried into the engine or they run backward into the carbureter and mix with the fuel so as to destroy the predetermined proportions of fuel and air produced by the carbureter, thus preventing the introduction of a proper mixture to the engine for exploding in the cylinders. This device is so constructed as to separate particles of water from the vapor.

Another object of the invention is to provide for pre-heating of the air and fuel vapor by the heat of the steam or watery vapor from the radiator.

The accompanying drawings illustrate the invention:

Figure 1 is a side elevation of a construction embodying the invention, the upper portion of the radiator being shown in vertical section.

Figure 2 is an enlarged elevation of the mixing chamber, or jacket, and its parts applied to the manifold which is shown fragmentarily in section.

Figure 3 is a vertical sectional elevation of Figure 2, omitting the manifold, taken on a plane passing through the fuel vapor supply pipe.

Figure 4 is an inverted plan section on the line indicated by x^4—x^4, Figure 2.

The engine proper is indicated at 1 and is provided with the usual intake manifold 2 connected with a carbureter 3 of any suitable construction. The fuel supply pipe to the carbureter 3 is indicated at 4. The water jacket of the engine 1 is connected by the usual conduit 5 to any suitable form of radiator 6. Positioned in the upper portion of the radiator 6 is an intake pipe 7 adapted to draw off steam or watery vapor produced by heat of the exploded charges in the engine in a well known manner. The pipe 7 discharges into a jacket or mixing chamber 8 which surrounds an inner chamber 9 provided at its lower end with a port 10 having a valve seat 11 for a valve 12. The stem 13 of the valve extends at its lower end into the port 10 and at its upper end into a guideway 13^a, there being a coil spring 14 surrounding the stem between the guide and the removable cap 15 of the jacket in which the way 13^a is formed. Screw-threaded into the cap 15 is a pipe ell 16 and communicating with the ell is a port or ports 17 formed in the cap 15. The ell 16 is screw threaded or otherwise fastened to the manifold 2 and communicates therewith so that on the suction stroke of the engine the pressure is lowered in the chamber 9, which results in lifting of the valve 12. The valve 12 will, of course, be opened to a degree dependent upon the degree of partial vacuum produced by the engine.

Communicating with the jacket 8 is a pipe 18 which is connected with a source of fuel vapor supply. In this particular instance the pipe 18 connects with the upper portion of the engine crank case 19 so that any hydrocarbon vapors in the crank case may be drawn therefrom through the pipe 18 into the jacket 8 by lowering of the pressure in the jacket when the valve 12 is opened. The pipe 18 could, instead, be connected to the upper portion of the fuel tank as has heretofore been done. When the pressure is thus lowered in the jacket 8, not only are fuel vapors introduced into the jacket, but steam or watery vapor is drawn through the pipe 7 into the jacket. Since the steam or watery vapor in the radiator is comparatively wet, there is a tendency for some of it to quickly condense and one of the functions of the jacket 8 is to catch the condensate and separate the same from the vapors or uncondensed steam, thus preventing particles of water from being thrown into the manifold and thence into the engine and carbureter.

It is clear that the jacket 8 also functions as a mixing chamber, the steam or watery vapor mixing in the jacket with the fuel vapors, and it is this mixture that passes from the jacket 8 into the chamber 9, where the steam and fuel become yet more intimately associated, and thence through the connection 16 to the engine manifold and finally to the engine cylinders.

The condensates in the jacket 8 are, of course, quite hot and are maintained in a hot condition by the continual introduction of steam from the radiator. It will thus be seen that a further function of the jacket 8 is to hold a heating medium in the form of steam, the heat thereof being applied to the jacket 8 and chamber 9 so that the fuel vapors passing through the jacket and chamber 9 will be preheated before their introduction into the engine manifold. This, of course, tends to produce a better combustible mixture in the engine than if the watery vapor and fuel vapors were introduced at a lower temperature.

In order that the condensate may be drawn off from the jacket 8 from time to time to prevent filling up of the jacket with the condensate, there is provided a drain cock 20 in the bottom of the jacket 8. The valve 12 cannot be opened beyond a predetermined degree because of the upper end of the valve stem stopping against an abutment 21 formed by the end wall of the way 13a.

If the operator of the engine desires to admit thereto an auxiliary supply of air in addition to the air that is supplied through the carbureter, he may open the drain cock 20, thus admitting air from the atmosphere into the heating jacket 8 where such air will become mixed with the steam and fuel vapor to pass into the engine. Of course, any desired means may be provided for opening and closing the cock 20 from a distant point, for example, from the driver's seat of an automobile on which the invention is installed, such means being so well understood that it is unnecessary to describe them in detail herein.

I claim:

1. In a humidifier adapted for use in connection with an internal combustion engine, the combination of a jacket provided with draining means, there being a detachable cap for the jacket, a chamber positioned in the jacket and sealed to the cap, and having a port in its lower end communicating with the interior of the jacket, and a suction-operated valve to control said port, there being an intake port in the jacket for steam and there being a pipe fastened to the cap and communicating with the interior of the chamber.

2. In a humidifier adapted for use in connection with an internal combustion engine, the combination of a jacket provided with draining means, there being a detachable cap for the jacket, and a chamber positioned in the jacket and sealed to the cap and having a port communicating with the interior of the jacket, there being an intake port in the jacket for steam and there being a pipe fastened to the cap and communicating with the interior of the chamber.

Signed at Los Angeles, California, this 1st day of March, 1921.

CHARLES POHL.

Witnesses:
GEORGE H. HILES,
L. BELLE WEAVER.