P. HUNT.

HUMIDIFIER FOR GASOLENE ENGINES.

APPLICATION FILED JULY 2, 1917.

1,274,418. Patented Aug. 6, 1918.

Fig. 1.

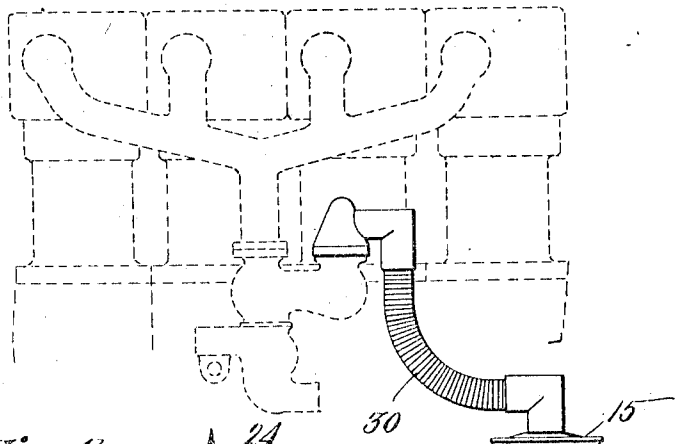


Fig. 2.

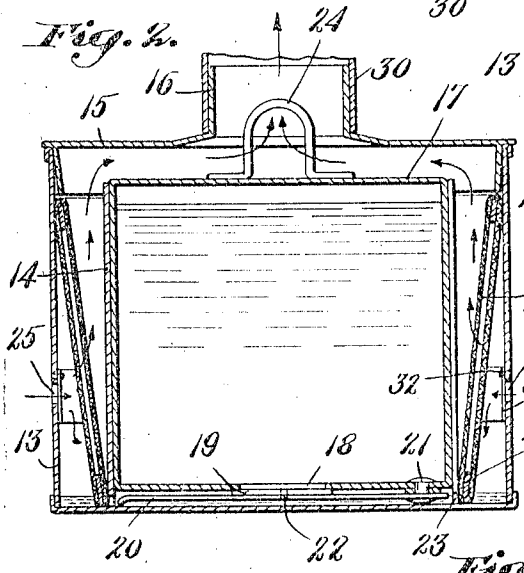


Fig. 3.

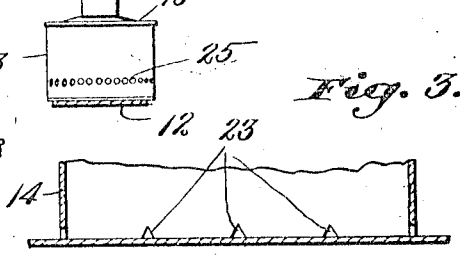


Fig. 5.

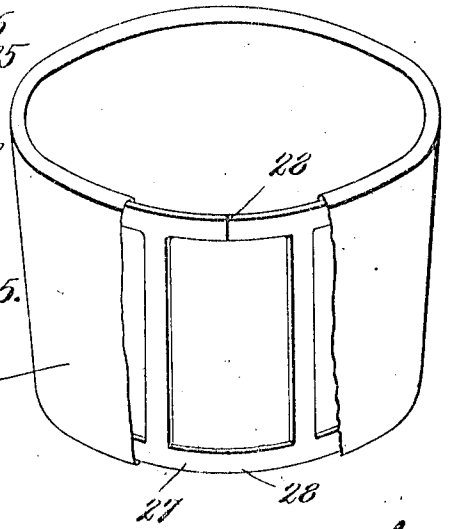
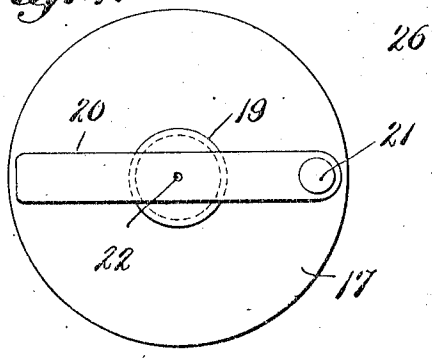


Fig. 4.



Inventor
Paul Hunt
by A. W. Harris Atty.

UNITED STATES PATENT OFFICE.

PAUL HUNT, OF BROOKLINE, MASSACHUSETTS.

HUMIDIFIER FOR GASOLENE-ENGINES.

1,274,418. Specification of Letters Patent. Patented Aug. 6, 1918.

Application filed July 2, 1917. Serial No. 178,323.

To all whom it may concern:

Be it known that I, PAUL HUNT, a citizen of the United States, of Brookline, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Humidifiers for Gasolene-Engines, of which the following is a specification.

This invention relates to means for improving the efficiency and smoothness of operation of gasolene engines, especially such as are used in automobiles, by moistening the air which passes to the in-take of the carbureter of the motor.

One of the objects of my invention is to provide a simple and inexpensive humidifier which, although quite small in size, will furnish ample moisture to the air.

Another object is to provide an improved device of this character having a readily removable moistening diaphragm constructed to provide the maximum area for access of the air.

With these and other objects in view my invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

Of the accompanying drawings,

Figure 1 represents my improved device in elevation and connected to the in-take of the carbureter of a gasolene motor, the latter being indicated by dotted lines.

Fig. 2 represents a vertical section through my improved humidifier.

Fig. 3 represents a detailed section through the lower portion of the inner wall.

Fig. 4 is a bottom plan view of the water reservoir.

Fig. 5 is a perspective view of the moistening diaphragm and its supporting frame.

Similar reference characters indicate the same or similar parts in all of the views.

A suitable base or support is indicated at 12 in Fig. 1, the humidifier resting thereon and secured thereto if desired in any suitable way.

The humidifier comprises an outer casing or shell 13 which is substantially cup-shaped, an inner wall 14 rising from the bottom of said shell, the latter having a suitable cap or cover 15 provided with a nipple 16.

Removably fitting the inner cylindrical wall 14 is a reservoir 17 having an opening 18 in its bottom. A disk-shaped closure 19 for said opening 18 is carried by a spring arm 20 pivoted to the bottom of the reservoir at 21, said closure having a small hole 22 through which water can escape to the space between the bottom of the reservoir and the bottom of the outer casing or shell.

Small notches or openings are formed in the bottom of the wall 14.

The top of the reservoir has a suitable handle 24 by which the reservoir, after the cover 15 is removed, can be lifted for filling purposes. When said reservoir is to be filled it is inverted, and the spring arm 20 carrying the closure 19 pushed aside so that water can be poured in through the opening 18, after which the closure 19 is returned to the position shown in Fig. 4 and the reservoir is placed in the position shown in Fig. 2, after which only so much water will escape through the small opening 22 as will rise to approximately the level of the tops of the notches 23. That is, water will rise in the annular space between the shells 13, 14 to approximately the height of said notches 23.

The outer shell is provided with small holes 25 to admit air to the annular space between shells 13, 14, such air being then drawn up, and to the in-take of the carbureter, thorugh any suitable conduit 30 connected with the nipple 16.

To moisten the air passing as above described I employ an inverted cone-shaped diaphragm consisting of suitable textile or other material 26 supported by an open-work frame 27, said frame being split as indicated at 28 in Fig. 5 to enable said frame to be opened or sprung out sufficiently to enable the absorbent material 26, which is in tubular form, to be removed from the frame and another one substituted therefor, or to enable the same one to be cleaned and returned. This structure provides absorbent material of double thicknesses the two thicknesses being slightly spaced as clearly shown in Fig. 2. Preferably the absorbent material is of loose-woven fabric or it may be knitted, the interstices of the fabric being such as to permit air to readily pass through. The double thickness, however, and the extensive area of the diaphragm, owing to its cone shape and crossing the annular passage for air as shown in Fig. 2, furnishes the maximum spread of moistened surface within a quite small size of device. The diaphragm crosses the annular passageway at an acute angle and its lower edge is consequently immersed in sufficient water to cause

the entire diaphragm to be moistened by capillary attraction. The particular shape of the diaphragm illustrated and described is such that its entire area is exposed to the air which is divided into small currents passing through the interstices of the fabric.

It is to be understood that in operation, the action of the humidifier is entirely automatic, the motor or engine itself furnishing the power for drawing in the air. With my devices in place as described, the operation of the engine draws the air through holes 25, and through the interstices of the absorbent diaphragm in the direction indicated by the arrows in Fig. 2, said diaphragm being automatically kept in moistened condition by capillary attraction and the feed from reservoir 17.

In order that water in the moistening chamber may not escape through the air inlet holes 25 when swaying of the automobile or other causes result in splashing or other movement of the water too high, I provide a suitable inwardly opening valve construction for said holes. This may consist, as illustrated in Fig. 2, of a flexible curtain 31 of suitable material (thin rubber if desired) which overhangs the holes. Said valve curtain may have its upper edge secured to the inner wall of the shell or casing by any suitable means such as rivets 32 which may be riveted to said wall or may be of spring metal to expand and clamp the upper edge of the curtain between it and said wall. The lower edge of the curtain overlaps the air inlet holes but yields to admit air. When the humidifier is used in connection with a motor that is subject to such movements as would cause the water in the moistening chamber to shift about somewhat violently (such movements as often occur with automobiles, motor boats, and especially flying machines) the check valve such as described prevents escape of the water.

Having now described my invention what I claim is:

1. A humidifier for gasolene engines having inner and outer parallel walls providing an annular passageway for a current of air, a diaphragm of absorbent material contacting with one wall at one end and with the other wall at the other end and means for automatically supplying said diaphragm with water.

2. A humidifier for gasolene engines having a passageway for a current of air, a frame removably mounted in said passageway, a diaphragm carried by said frame, said diaphragm comprising two thicknesses of absorbent material with a space between them, and means for automatically supplying said diaphragm with water.

3. A humidifier for gasolene engines having an annular passageway for air, a cone-shaped diaphragm contacting at opposite ends with the inner and outer walls of said passageway and crossing said passageway at an acute angle to the direction of the current of air, and means for automatically supplying said diaphragm with water.

4. A humidifier for gasolene engines having an annular passageway for air, a cone-shaped diaphragm crossing said passageway at an acute angle to the direction of the current of air, and means for automatically supplying said diaphragm with water, said means comprising a reservoir adapted to continuously supply a limited amount of water, the inner wall of the annular passageway having openings to limit the water to the lower portion of the annular space containing the diaphragm.

5. A humidifier for gasolene motors having a chamber provided with an air inlet and an air outlet, means for supplying the lower portion of the chamber with water, absorbent material in said chamber, and a check valve for preventing escape of water through said air inlet.

6. A humidifier for gasolene motors having inner and outer walls providing an annular chamber between them, the outer wall having a series of air-inlet holes, an air outlet from said chamber, means for supplying the lower portion of the chamber with water, absorbent material in said chamber, and a flexible valve curtain overlapping the inner ends of said air-inlet holes.

In testimony whereof I have affixed my signature.

PAUL HUNT.