

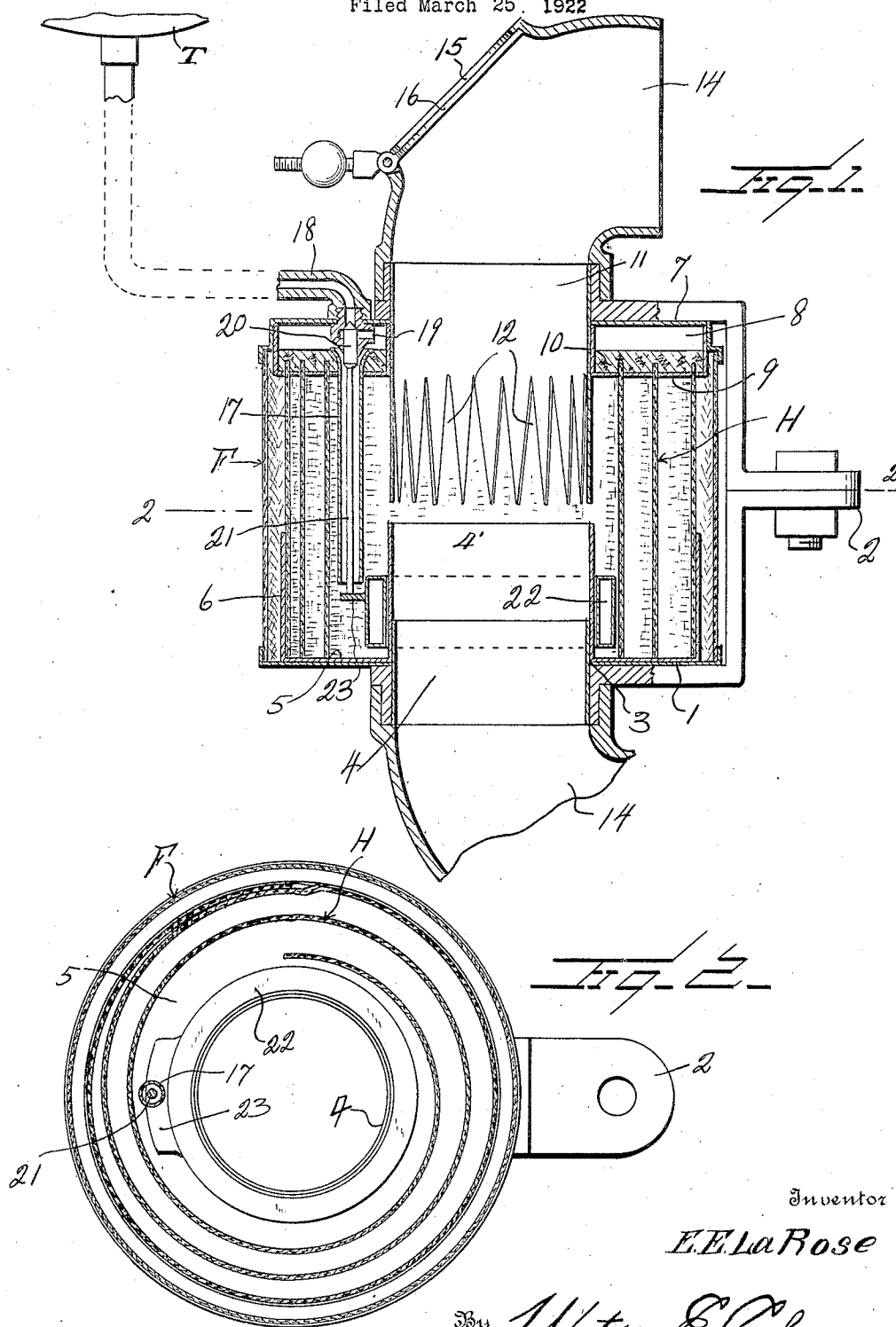
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E. E. LA ROSE

HUMIDIFYING AND FILTERING DEVICE FOR INTERNAL COMBUSTION ENGINES

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Inventor

E. E. La Rose

By *Watson E. Coleman*
Attorney

UNITED STATES PATENT OFFICE.

EUGENE E. LA ROSE, OF NIAGARA FALLS, NEW YORK.

HUMIDIFYING AND FILTERING DEVICE FOR INTERNAL-COMBUSTION ENGINES.

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To all whom it may concern:

Be it known that I, EUGENE E. LA ROSE, a citizen of the United States, residing at Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Humidifying and Filtering Devices for Internal-Combustion Engines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in humidifying and filtering devices for internal combustion engines, and it is an object of the invention to provide a device of this general character having novel and improved means whereby the humidifying element is maintained saturated both by capillary attraction and seepage.

Another object of the invention is to provide a novel and improved device of this general character consisting of a humidifying element having its opposite end portions disposed within supply chambers to maintain said element at proper moisture, together with means for maintaining a desired supply of liquid within said chambers.

An additional object of the invention is to provide a novel and improved device of this general character consisting of a pair of spaced containers and a humidifying element interposed between said containers and extending therein and wherein means is employed to maintain a desired supply of liquid within the containers, said means being operated by the rise and fall of the liquid level in one of the containers.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved humidifying and filtering device for internal combustion engines whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view partly in section and partly in elevation illustrating a humidifying and filtering device constructed in ac-

cordance with an embodiment of my invention; and

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1.

As disclosed in the accompanying drawings, 1 denotes a bottom plate provided with means such as a lug or lip 2 whereby the device in its entirety may be suitably secured in operative or working position. The bottom plate 1 is provided with a central opening 3 through which extends a tube 4, said tube extending upwardly through the bottom 5 of a cup member 6, mounted upon the bottom plate 1, said tube 4 telescopically fitting within an inwardly extending cylindrical portion 4' at the center of the cup, the parts 4—4' cooperating to form an outlet tube projecting within the enclosed central compartment of the casing and terminating above the upper peripheral edge of the cup member 6. The major diameter of the cup member 6 is less than the major diameter of the bottom plate 1.

Extending upwardly from the peripheral portion of the bottom plate 1 is a filtering element F. This element F is of desired height and supports a cover member 7. The cover member 7 also closes an annular chamber 8. The filtering element F constitutes the outer side wall of the device and operates as a dry filter to separate from the air entering within the device, dust, oil and other foreign matter.

Supported within the cup member 6 is a humidifying element H. As herein disclosed, this element H is arranged in spiral form and the upper edge portion of said humidifying element extends through the bottom 9 into the chamber 8. Arranged within the lower portion of the chamber 8 is a packing 10 of sponge, felt or other absorbent material so that, when said packing is saturated with water, the chamber 8 is effectively sealed against air entering therefrom from the outside.

Extending within the device through the central opening defined by the chamber or container 8 is a tube 11, the inserted end portion of said tube being provided therearound with circumferentially spaced slots 12, said slots being disposed lengthwise of the tube 11 and gradually increasing in width from the top towards the bottom to provide an opening of the minimum area at the top and maximum area at the bottom.

Since the principal source of moisture for the humidifying element H in the water contained in the cup 6 and the degree of saturation of the several superposed portions of said element normally decreases towards the top thereof, the wider portions of the slots 12 are disposed opposite the wetter parts of the humidifying element so as to permit an increased flow of air through these wetter parts and the decrease in the width of the slots therefore serves as a regulating means governing the moistening of the air passing through the device. These slots 12 assure the desired substantially uniform saturating or humidifying of the air drawn within the device and passing outwardly through either or both of the outlet tubes 4-4' and 11.

The outer end portions of the tubes 4 and 11 have secured thereto the elbows 14 which are adapted to communicate with the primary and secondary openings of a carbureter and in the event the device is employed in connection with only one of said openings, the non-functioning elbow is closed by a cap or the like (not shown).

One of the elbows 14, preferably the upper one, is provided with an opening 15 which is normally closed by the balanced valve 16. The valve 16 may be adjusted so that the same will open upon predetermined pressure within the device to relieve any resistance offered to the air should the device become congested from any cause.

Extending within the chamber or container 8 through the bottom thereof is a pipe 17 open at its opposite ends and of a length to terminate within the cup member 6. The upper end of the pipe 17 terminates a desired distance above the bottom of the chamber or container 8 and said upper end portion is bell-shaped.

18 denotes a supply pipe leading from a suitable source of water supply and discharging within the chamber or container 8 through the nozzle 19. Flow through the nozzle 19 is controlled by the valve 20, said valve 20 being provided with a stem 21 which extends downwardly through the pipe 17 and terminates therebelow.

Surrounding the inwardly extending portion of the tube 4-4' is a float 22 provided with an outstanding finger or lug 23 which underlies the stem 21.

The water within the cup member 6 will saturate the humidifying element H by capillary attraction and the upper portion of said humidifying element will be further maintained properly moistened by the seepage of the water from within the chamber or container 8 and downwardly of the element H.

The pipe 18 preferably leads from a closed tank T so that in the event the valve 20 should fail to close from any cause, the water in the cup member 6 will seal the pipe

17 as the level of the water within the member 6 rises above the lower or discharge end of said pipe 17. It is to be understood, however, that the tank T can be of open type but the closed type of tank is preferred for the reasons just stated.

From the foregoing description it is thought to be obvious that a humidifying and filtering device for internal combustion engines constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:

1. A humidifying and filtering device comprising a casing having a perforated wall, a container within the lower portion of said casing, a closed chamber in the upper portion of said casing, a humidifying element bridging the space between said container and chamber extending within both the container and chamber and forming a central compartment, means for delivering a liquid within the chamber, means for discharging the liquid from the chamber into the container, and an outlet tube extending within said compartment and leading from said compartment.

2. A humidifying and filtering device comprising a casing having a perforated peripheral wall, a container within the lower portion of said casing, a closed chamber in the upper portion of said casing, a humidifying element bridging the space between said container and chamber extending within both the container and chamber and forming an enclosed central compartment, an outlet tube extending within and leading from said compartment, means for delivering a liquid within the chamber, means for discharging the liquid from the chamber into the container, and means operable upon the rise and fall of the liquid level within the container for controlling the delivery of liquid to the chamber.

3. A humidifying and filtering device comprising a perforated casing, a container within the bottom of the casing, a closed chamber in the upper portion of the casing, a humidifying element interposed between the container and the chamber extending into both the said container and chamber and enclosing a central compartment, an outlet tube leading from said compartment, means for delivering liquid to the chamber, a pipe extending within the chamber and

discharging to the container, the opposite ends of said pipe being open, a valve for controlling the discharge of liquid to the chamber, and a float responsive to the level of the liquid within the container for actuating the said valve.

4. A humidifying and filtering device comprising a perforated casing, a container within the bottom of the casing, a closed chamber in the upper portion of the casing, a humidifying element interposed between the container and the chamber and extending into both said container and chamber, means for delivering liquid within the chamber, a pipe extending within the chamber and discharging within the container, the opposite ends of said pipes being open, a valve for controlling the discharge of liquid within the chamber, and a float operating upon the rise of the liquid level within the container for moving the valve into closed position, said valve moving under the influence of gravity into open position upon the fall of the float with the lowering of the liquid level within the container.

5. A humidifying and filtering device comprising a casing having a perforated wall serving as an inlet, a container within the lower portion of said casing, a closed liquid-receiving chamber in the upper portion of said casing, a humidifying element bridging the space between said container and chamber extending into both the container and chamber and enclosing a central outlet compartment and through which humidifying element all air entering the device must pass to reach said compartment, and means for delivering liquid to both said chamber and said container.

6. A humidifying and filtering device comprising a casing having a perforated wall serving as an inlet, a container within the bottom of the casing, a closed liquid-receiving chamber in the upper portion of the casing, a humidifying element interposed between the container and chamber extending into both said container and chamber and enclosing a central outlet com-

partment and through which humidifying element all air entering the device must pass to reach the said compartment, means for delivering liquid to the chamber, an open ended pipe extending within the chamber and discharging within the container, a valve for controlling the discharge of liquid into the chamber, and means responsive to the level of the liquid within the container for actuating the said valve.

7. A humidifying and filtering device comprising a casing having a perforated wall serving as an inlet, a container within the lower portion of said casing, a closed liquid receiving chamber in the upper portion of said casing, a humidifying element extending within both the container and chamber bridging the space between the same and enclosing a central outlet compartment and through which humidifying element all air entering the device must pass to reach said compartment, means for delivering a liquid to the chamber, and an open conduit depending from the chamber into the said container.

8. A humidifying and filtering device comprising a casing having a perforated peripheral wall serving as an inlet, a container within the lower portion of said casing, a closed liquid-receiving chamber in the upper portion of said casing, a humidifying element extending within both the container and chamber bridging the space between the same and enclosing a central outlet compartment and through which humidifying element all air entering the device must pass to reach said compartment, a pipe delivering liquid to the chamber, an open conduit establishing communication between the chamber and container and extending within the container, and means responsive to the level of the liquid within the container for controlling the flow of liquid through the said pipe.

In testimony whereof I hereunto affix my signature.

EUGENE E. LA ROSE.