March 7, 1933. R. C. LUPLOW 1,900,453

HUMIDIFIER

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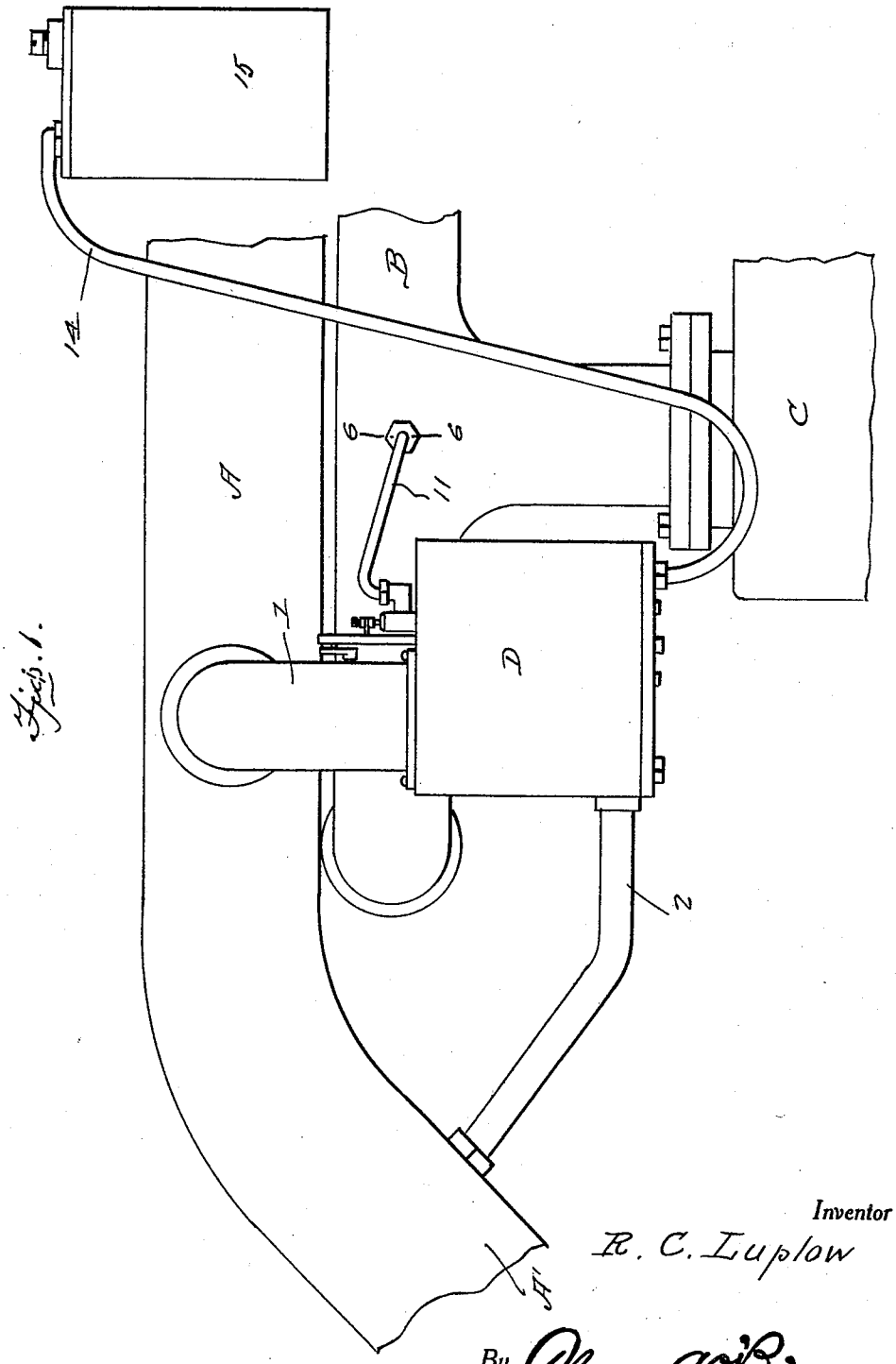


Fig. 1.

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Fig. 2.

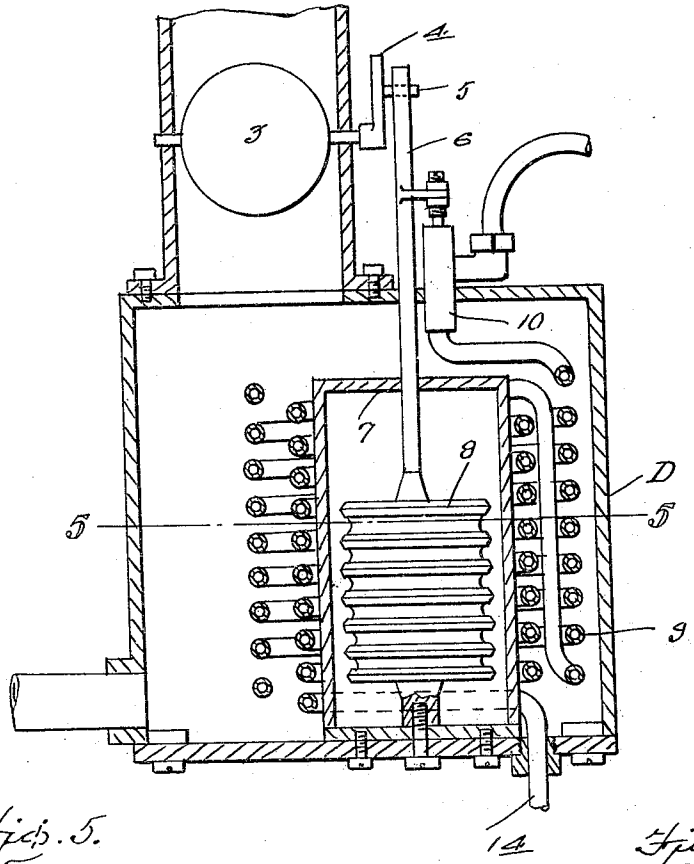


Fig. 5.

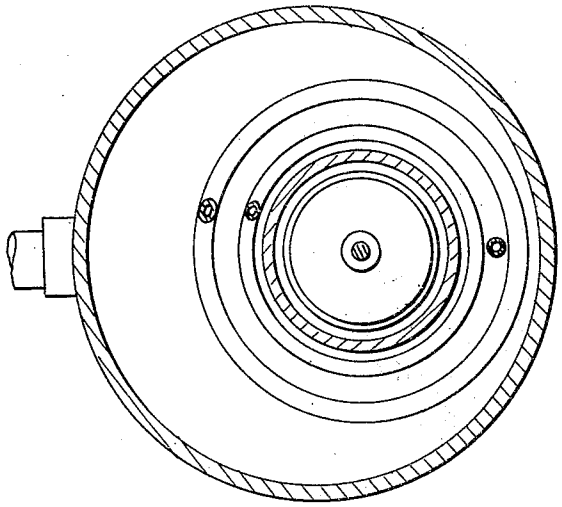
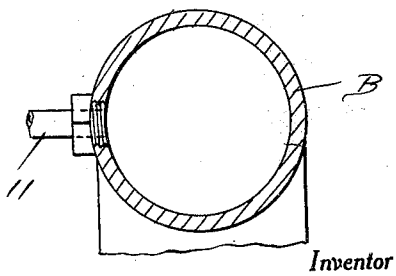


Fig. 6.



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Fig. 4.

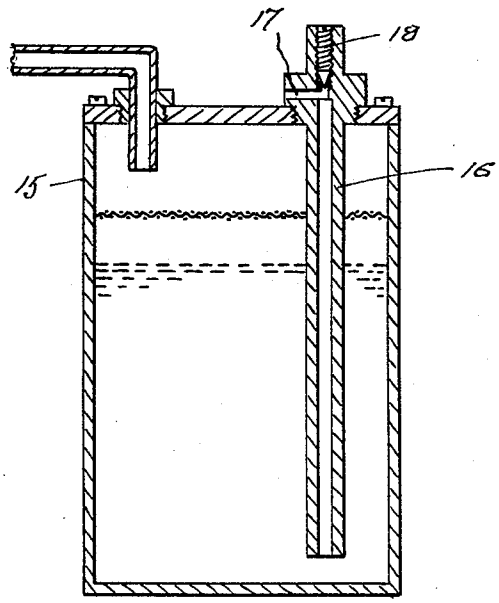


Fig. 3.

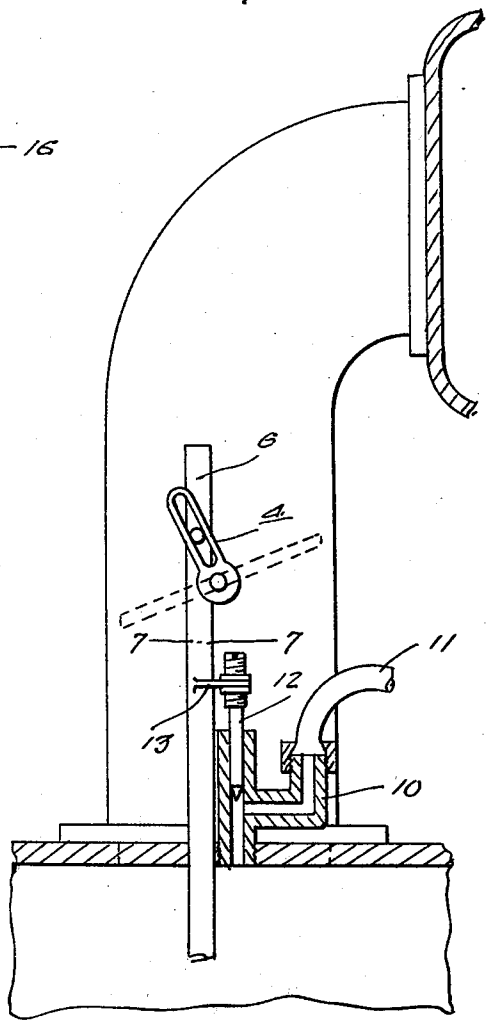
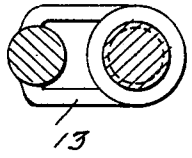


Fig. 7.



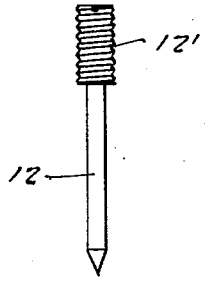


Fig. 8.

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Patented Mar. 7, 1933

1,900,453

UNITED STATES PATENT OFFICE

RONALD C. LUPLOW, OF SELIGMAN, ARIZONA

HUMIDIFIER

Application filed August 26, 1931. Serial No. 559,554.

This invention relates to a humidifier for internal combustion motors, the general object of the invention being to provide means for introducing steam into the inlet manifold of the engine with means for automatically controlling the flow of steam into the manifold according to the speed of the engine.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is an elevation of parts of the inlet exhaust and carburetor of an internal combustion engine showing the invention applied thereto.

Figure 2 is a vertical sectional view through the invention.

Figure 3 is a view looking toward the left hand side of Figure 2.

Figure 4 is a view of the water tank with the parts in section.

Figure 5 is a transverse sectional view of Figure 2 the section being taken on line 5—5 of Fig. 2.

Figure 6 is a section on line 6—6 of Figure 1.

Figure 7 is a section on line 7—7 of Figure 3.

Figure 8 is a detail view of the valve for controlling the flow of vapor to the inlet manifold.

In these drawings, the letter A indicates the exhaust manifold, the letter B the inlet manifold, the letter C the carburetor and the letter D indicates a casing the top of which is connected by the pipe 1 with the exhaust manifold and the lower part of which is connected by a pipe 2 with the exhaust pipe A′ of the exhaust manifold. Thus some of the exhaust gases will flow from the exhaust manifold through the pipe 1 into the casing D and will pass from the casing through the pipe 2.

A damper 3 is located in the pipe 1 and has a slotted arm 4 connected to the end of the shaft of the damper and a pin 5 on a rod 6 passes through the slot in the arm. This rod passes through a hole in the top of the casing D and through a hole in the top of a casing 7 located in the casing D with its lower end connected to a thermostat 8, of the bellows type located in the casing 7 so that the expansion and contraction of the thermostat will cause the arm 6 to operate the damper 3 through the arm 4 and the pin 5. A coil 9 is located in the casing D and surrounds the casing 7 and has one end connected to a coupling 10 which is connected by a tube 11 to the inlet manifold B and a needle valve 12 controls the passage of vapor through the coupling, this needle valve being adjustably connected to the rod 6 by having its threaded upper part 12′ engaging a bracket 13 carried by said rod 6.

The other end of the coil is connected by a pipe 14 which passes through the bottom of the casing D to the top part of a tank 15 which contains water. A tube 16 passes through the top of the tank to a point adjacent the lower end thereof with a port 17 in the upper end of the tube controlled by a valve 18.

When the motor is cold the damper will be fully open as the thermostat 8 will be contracted and the needle valve 12 will be closing the passage in the coupling 10. As soon as the motor starts up however the exhaust gases flowing through the casing D will heat the casing 7 and the thermostat so that the thermostat will expand thus partly closing the damper and opening the valve 12 and the exhaust gases passing through the casing will heat the water laden air in the coil 9 so that steam will form which will pass through the coupling 10, pipe 11 into the inlet manifold B where it will mix with the explosive mixture from the carbureter and thus pass into the cylinders of the engine. The suction of the piston will create a vacuum in the coils and pipe 14 so that vacuum will be created in the top of the tank 15 whereby air will

be drawn through the port 17 and tube 16 and the air will bubble up through the water in the tank. Thus the air will be charged with water and the mixture will be carried into the coils where it will be vaporized by the products of combustion passing through the casing D.

The thermostat also automatically controls the damper 3 so as to regulate the amount of exhaust gases passing through the casing D for heating the mixture in the coils. As soon as the motor is stopped and has cooled, the thermostat contracts closing the valve 12 and opening the damper 3. The adjustment of the valve 12 and the valve 18 will regulate the amount of steam passing into the inlet manifold.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts provided that such changes fall within the scope of the appended claim.

Having thus described my invention, what I claim as new is:

In combination with an internal combustion engine including its inlet and exhaust manifolds, a casing, a pipe connecting the top of the casing with the exhaust manifold, an exhaust pipe connected with the lower part of the casing, a damper in the first pipe, a second casing in the first casing, a thermostat therein, a rod connected with the thermostat and passing through the two casings, one end of the rod engaging the arm of the damper, a coil in the first casing and surrounding the second casing, a pipe connecting the upper end of the coil to the intake manifold, a valve for controlling the flow of vapor through said last-mentioned pipe, means for adjustably connecting said valve to the rod, whereby said valve will be operated by a movement of the rod from the thermostat, a tank, a pipe connecting the upper end of the tank with the lower end of the coil, a pipe passing through the top of the tank to a point adjacent the lower end thereof and having a port in its upper end opening to the atmosphere, and a valve for controlling said port.

In testimony whereof I affix my signature.

RONALD C. LUPLOW.