

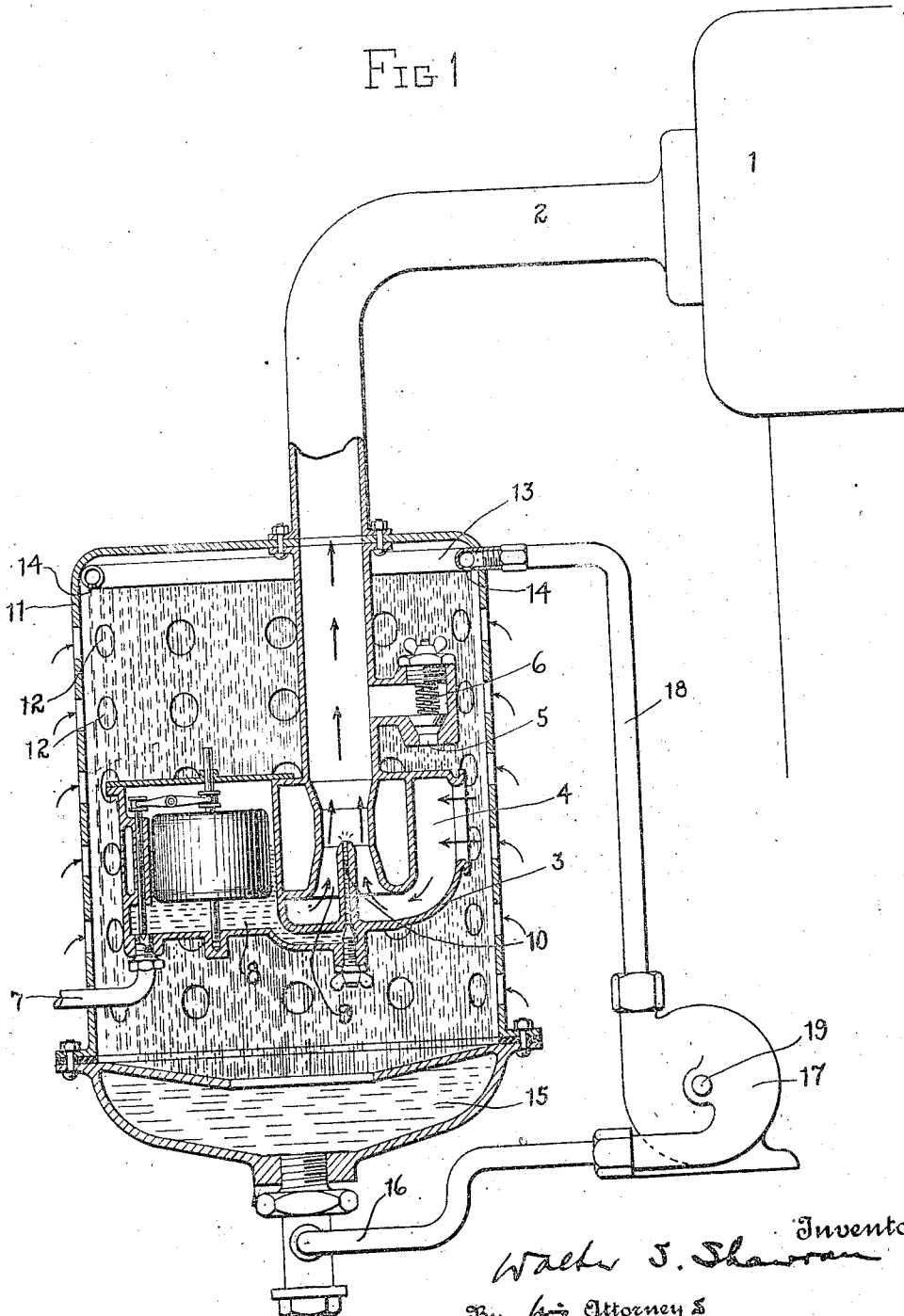
W. S. SHAWVAN.
 HUMIDIFIER FOR INTERNAL COMBUSTION ENGINES.
 APPLICATION FILED AUG. 30, 1917. RENEWED OCT. 26, 1918.

Patented Mar. 18, 1919.

1,297,598.

2 SHEETS—SHEET 1.

FIG 1



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 By his Attorney &
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2 SHEETS—SHEET 2.

FIG 2

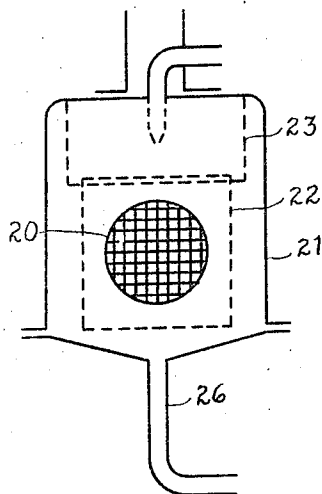


FIG 3

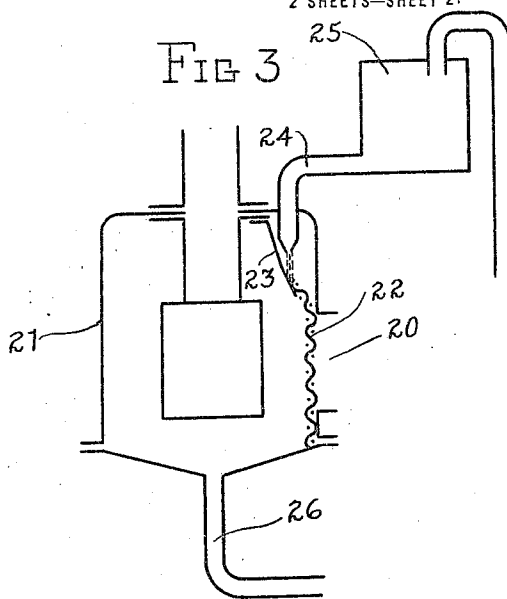


FIG 4

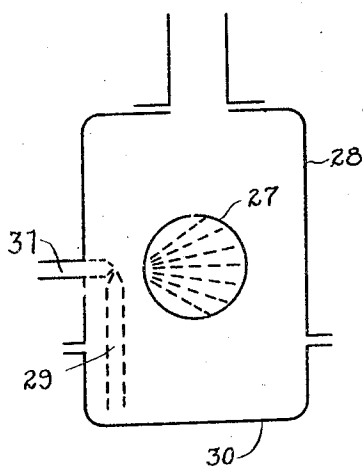
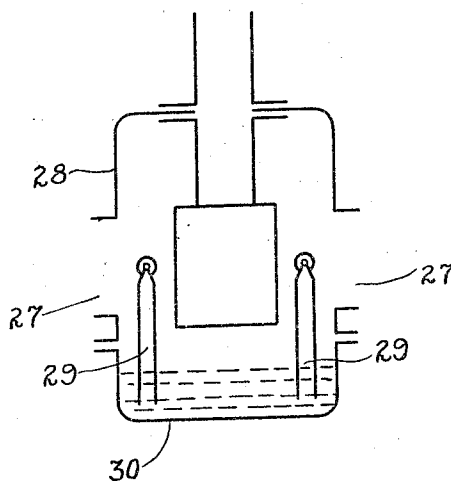


FIG 5



Walter S. Shawvan Inventor
By his Attorneys
Eugene B. Jones & Harry

UNITED STATES PATENT OFFICE.

WALTER S. SHAWVAN, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
THE ESTA COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSA-
CHUSETTS.

HUMIDIFIER FOR INTERNAL-COMBUSTION ENGINES.

1,297,598.

Specification of Letters Patent. Patented Mar. 18, 1919.

Application filed August 30, 1917. Serial No. 186,904. Renewed October 26, 1918. Serial No. 259,853.

To all whom it may concern:

Be it known that I, WALTER S. SHAWVAN, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented an Improvement in Humidifiers for Internal-Combustion Engines, of which the following is a specification.

My invention relates to means for supplying humidified air to an internal combustion engine, and has particular reference to supplying air which has been humidified by contact with water to said engine, as distinguished from supplying air mixed with water, as for instance, water in an atomized state, or water in the fluid form.

My invention is particularly applicable to fuel mixing devices or carbureters adapted to operate in connection with engines designed for variable speeds, wherein the carbureter is supplied with a plurality of air intakes, some having a fixed adjustment and others operating automatically according to the engine speed, but it will be understood that it may be applied to any form of fuel mixing device, whether operated in connection with stationary or automotive engines, and whether using a liquid or gaseous fuel.

My invention aims to provide means whereby all of the air taken into the internal combustion engine is humidified by passing through water in a finely divided state, but it will be understood that it is possible to so arrange the apparatus that only some of the air intakes of the engine are supplied with such humidified air.

In the drawings, I have shown:

In Figure 1, a sectional view of one form of my improved device;

In Figs. 2 and 3, a side and sectional view, respectively, of a diagrammatic form of a modification of my device; and

In Figs. 4 and 5, a side and sectional view, respectively, of a diagrammatic representation of another modification of my invention.

In general, my improved apparatus consists in means for forming a wall of water in a finely divided state about the carbureter, so that the air taken in through the air intakes of the carbureter must pass through said wall of water and thus become humidified. It is evident that this general apparatus may be varied in a number of ways, and I therefore do not wish to limit

myself to the precise forms shown and described, since many modifications may be made without departing from the spirit of my invention.

A convenient method of accomplishing this result is to inclose the carbureter in an apertured chamber and arrange the means for forming a wall of water in a finely divided state in front of said apertures and between said apertures and the air intakes of the carbureter.

While I prefer to use ordinary water in connection with my apparatus, it is entirely possible to use the same in connection with other fluids, if desired, and I therefore do not wish to limit myself to the use of water alone in my device.

In Fig. 1, I have diagrammatically indicated an internal combustion engine as 1, said internal combustion engine being supplied with the usual intake manifold 2. Connected to the intake manifold is a carbureter 3, which may be of any suitable kind and is provided with an air intake 4, and an auxiliary air intake 5 operating against the spring 6 in the usual manner. Fuel is supplied to the carbureter through pipe 7 and the carbureter has the usual float chamber 8, mixing chamber 9 and spray nozzle 10. Surrounding the carbureter 3 is the apertured chamber 11, closed at the top and bottom, and provided with a plurality of apertures 12 in its side walls. These apertures may be of any suitable shape or size and may be located in any convenient or suitable place in the wall of the chamber.

Adjacent the top of the chamber 11 is a pipe 13 which has a plurality of fine holes 14, through which water may be sprayed downwardly in front of the apertures 12 of the chamber 11. A water container 15 catches any excess of water and serves as a water storage reservoir. Said container may be conveniently located at the bottom of the chamber 11, or may be a separate container as shown in Figs. 2 and 3.

In the bottom of container 15 is led pipe 16 connected to a pump 17 which may be of any suitable kind, which is connected by means of pipe 18 to the perforated spray pipe 13 located within the chamber 11. Pump 17 may be driven by means of shaft 19 connected to the internal combustion engine 1, or any other suitable source of power.

It will be evident that in the operation of

my device, the water being sprayed from the apertures 14 in pipe 13 produces a wall of water in a finely divided state about the carbureter, so that air entering into any of the carbureter inlets must be drawn through the apertures 12, as indicated by the arrows in Fig. 1, and there pass through the water before reaching the carbureter. A very large surface of the air is thus presented to the water and a consequently large amount of water is absorbed by the air.

If too high a degree of humidity is produced, it may be reduced by reducing the number of apertures and consequently increasing the velocity of the air, or by decreasing the number of holes 14 in the pipe 13, thus producing fewer streams in front of the apertures, thereby covering them to a lesser extent.

In Figs. 2 and 3, I have shown a modification of my apparatus which consists in covering an aperture 20 in a chamber 21 with a screen 22 which may be of any suitable mesh to produce the desired results. Water is directed upon the screen 22 by means of a trough 23 extending across the chamber 21 and communicating with the screen 22, water being admitted through pipe 24 to the trough from container 25. The water is thus distributed over the screen 22 through which the air taken by the carbureter passes, and thus forms a wall of water in a finely divided state for the air to contact with. Any excess of water is drawn off through the pipe 26 and returned to the container 25, if desired.

In Figs. 4 and 5, I have shown a modification of my invention which consists in placing an atomizer adjacent to the air inlets 27 of a closed chamber 28. The atomizer may consist of a pipe 29, which may be arranged to terminate in the water container 30 located at the bottom of the chamber 28 and an air pipe 31 supplied with compressed air from any suitable source. In this modification of my invention, I may, by immersing the lower end of the pipe 29 in the water dispense with the return pump altogether, the excess of water falling to the bottom of the chamber and being drawn up again through the pipe 29.

From the foregoing description, it will be seen that the various modifications of my invention illustrated in the drawings are intended to be illustrative only and are not intended to indicate the only ways in which my invention may be carried out.

What I claim is:

1. In a device of the kind described, an internal combustion engine, a fuel mixing

device having an air inlet connected to said engine, and means for causing the air admitted to said air inlet to pass through a curtain of water in a finely divided state.

2. In a device of the kind described, an internal combustion engine, a fuel mixing device having an air inlet, and means for interposing a curtain of water in a finely divided state between said air inlet and the outer air.

3. In a device of the kind described, an internal combustion engine, a fuel mixing device connected thereto, an apertured chamber surrounding the fuel mixing device, and means for producing a curtain of a fluid in a finely divided state over said apertures.

4. In a device of the kind described, an internal combustion engine, a carbureter, an apertured chamber surrounding said carbureter, and means for producing a spray of fluid in front of said apertures.

5. In a device of the kind described, an internal combustion engine, a carbureter having an air inlet connected thereto, an apertured chamber surrounding said carbureter, and means whereby air supplied to said air inlet is drawn through said apertures and water.

6. In a device of the kind described, an internal combustion engine, a carbureter connected thereto and having a plurality of air inlets, an apertured chamber surrounding said carbureter, and means for producing a spray of water in a finely divided state in front of said apertures, whereby air entering any of said inlets is drawn through said apertures and through the water.

7. In a device of the kind described, an internal combustion engine, a carbureter connected thereto, an apertured chamber surrounding said carbureter, means located adjacent the top of the chamber for spraying water adjacent the walls of the chamber, a water inlet to said chamber, a water container communicating with said chamber, and means whereby water may be drawn from said container and supplied to the water inlet.

8. In a device of the kind described, a carbureter, an apertured chamber surrounding said carbureter, a water container communicating with said chamber and means, communicating with said water container, for forming a wall of water in front of said apertures.

In testimony whereof I have signed my name to this specification this 29th day of August, 1917.

WALTER S. SHAWVAN.