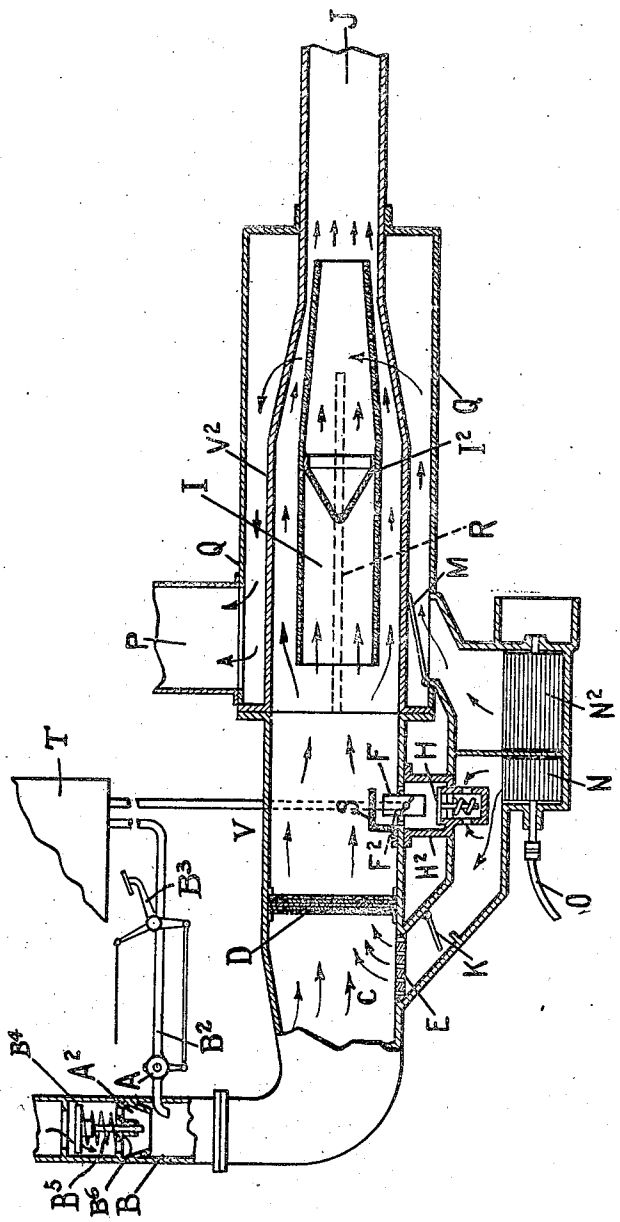
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BURNER

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INVENTOR
LOUIS C. HYATT
BY
E. M. Bentley
ATTORNEY

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LOUIS C. HYATT, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR-HEATING COMPANY, INC., OF ALBANY, NEW YORK, A CORPORATION OF NEW YORK

BURNER

Application filed December 23, 1927. Serial No. 242,070.

For a detailed description of the present form of my invention, reference may be had to the following specification and to the accompanying drawing forming a part thereof.

My invention relates to an apparatus designed to purify noxious gases by burning the dangerous ingredients thereof and at the same time utilize the heat of the combustion for heating and ventilating purposes.

Referring to the drawing, B represents the pipe which supplies the noxious gas which, in this case, is the exhaust pipe of an automobile propelled by an internal combustion engine. The gas from pipe B is delivered to a combustion pipe V which, in turn, delivers it to a pipe V^2 in the combustion chamber I. The innocuous products of the combustion are delivered into the atmosphere at J. N and N^2 represent the two parts of a divided blower-rotor driven in any suitable manner, here indicated as a flexible shaft O, driven from a suitable source of power not shown. The two parts of the blower deliver separate air currents. One current is directed by blower section N into pipe B and mingles with the noxious gas therein at the point C after it goes through a check-valve K and a screen E. The check-valve prevents the gas from being forced by back-pressure into the air current that goes to the vehicle body. The other current from blower section N^2 is directed through check-valve M into a closed casing Q which surrounds the aforesaid pipe V^2 but is spaced therefrom. The space between Q and V^2 is divided on each side into two parts by a horizontal partition R whereby the entering air current is directed along lengthwise of the heated pipe V^2 to the right and after passing around the end of partition R passes to the left and there emerges into duct P which delivers it to the body of the car for heating and ventilating it. The combined air and gas from pipe B pass through a double Davy screen D, packed with an intermediate pile of perforated copper plates, into pipe V where it is ignited and the combustion maintained by a pilot burner F. Said burner may be of any desired construction and, therefore is illustrated diagrammatically. The flow of gases through the burner, at the normal velocity of their travel, creates a pressure which will blow out the flame of the pilot burner F unless some precaution is taken to prevent. Extinction of the pilot burner is prevented by extending over the burner an arched perforated screen S which acts to prevent extinction of the flame by the velocity of the gas current from pipe B. The burner F is located in an underlying pocket H^2 into which a suitable small amount of air enters from the branch air current produced by blower-section N, under the control of the check-valve H, which prevents extinction of the burner by back-firing. The fuel for the pilot burner is supplied from tank T located at any desired position, and the volume of fuel is manually controlled by a butterfly valve F^2. The burning gas, after passing the pilot flame F, enters the combustion chamber I within pipe V^2 and in said chamber is a stabilizer I^2 such as is shown in my application for patent bearing Serial No. 189,320, filed May 6th, 1927, and not claimed herein.

I preferably introduce into the gas current in pipe B a small amount of suitable fuel by means of pipe B^2, leading from a suitable source of fuel supply such as tank T. The amount of such fuel is controlled by a valve A operated by the accelerator B^3 of the engine. Thereby the amount of supplementary fuel will be varied with changes in the position of the accelerator during operation of the engine. By this arrangement, the supplemental fuel supply will be proportional with the supply of explosive mixture fed to the engine, and therefore is directly proportional with the volume of the exhaust gases discharged by the engine. That portion of the air introduced by blower section N^2 is heated by its passage over the hot surface of pipe V^2 and then is delivered to the body of the vehicle through duct P serving also to ventilate the vehicle by constant introduction of outside air which has been previously heated.

In pipe B is a central spout A^2 through which the exhaust gases pass. This tends

to increase the suction of the gases on the supplementary fuel from pipe B^2. Also in pipe B is a check valve B^4 which prevents extinction of the igniting flame in the burner and prevents any impairment of the engine action while the burner is in use. A suitable guide B^6 is provided for the valve B^4, which has a light compression spring B^5 under it so as to balance the weight of the valve. Thus, the gases from the engine will open the valve in proportion to their volume and pressure. The valve will close if there is a back pressure flowing toward the engine. Therefore, while the gases from the engine flow against the valve, it will be open to an extent proportional to the volume and pressure of the gases flowing against it. The spring balanced valve also prevents extinction of the igniting flame and also improves the action of the burner by preventing backward flow of the gas in the exhaust pipe. Actual tests have shown that the exhaust comes in the form of impulses of alternately compressed and rarified gases, and in some types of engines and conditions of operation, this effect is more pronounced than in others. The valve also improves the action of the engine itself because back flow therein tends to restrict the inflow.

What I claim as new and desire to secure by Letters Patent is:—

1. A burner for exhaust gases comprising a combustion chamber, a mixing chamber communicating with said combustion chamber and having an exhaust gas inlet conduit, an air inlet conduit connected with said mixing chamber and positioned to introduce air into said gases as they travel through the mixing chamber, so as to produce an explosive mixture, a blower for forcing air through said air conduit, means for introducing a supplemental fuel supply into said gas inlet conduit, and means for proportioning the volume of supplemental fuel supply to the volume of exhaust gases passing to said mixing chamber.

2. A burner for exhaust gases comprising a combustion chamber, a mixing chamber communicating with said combustion chamber and having an exhaust gas inlet conduit, an air inlet conduit connected with said mixing chamber and positioned to introduce air into said gases as they travel through the mixing chamber so as to produce an explosive mixture, a fuel burner in said combustion chamber for igniting said mixture, means for supplying fuel to said burner, and means for supplying air to said fuel burner.

3. A burner for exhaust gases comprising a combustion chamber, a mixing chamber communicating with said combustion chamber and having an exhaust gas inlet conduit, an air inlet conduit connected with said mixing chamber and positioned to introduce air into said gases as they travel through said mixing chamber, so as to produce an explosive mixture, an air heating chamber surrounding said burner, an air inlet conduit for said heating chamber having a portion lying contiguous to the first mentioned air inlet conduit, a double blower having portions in the respective air inlet conduits, and means for operating said blowers.

4. A burner for exhaust gases comprising a combustion chamber, a mixing chamber, a perforated flame guard between the mixing chamber and the combustion chamber, said guard providing a communication between said chambers, an exhaust gas inlet conduit connected with said mixing chamber, an air inlet conduit connected with said mixing chamber and positioned to introduce air into said gases as they travel through the mixing chamber so as to produce an explosive mixture, and ignition means located within said combustion chamber.

5. A burner for exhaust gases comprising a combustion chamber, a mixing chamber connected therewith and having an exhaust gas inlet conduit, an air supply conduit connected with said mixing chamber so as to produce an explosive mixture therein, means for maintaining a constantly burning ignition flame in said combustion chamber, a perforated guard for said flame-maintaining means so as to protect the flame from extinction by the pressure of said mixture, an air pressure supply for said flame-maintaining means, and a check valve controlling said last mentioned air pressure supply.

6. A burner for exhaust gases comprising a combustion chamber, a mixing chamber connected therewith and having an exhaust gas inlet conduit, an air supply conduit connected with said mixing chamber so as to produce an explosive mixture therein, means for maintaining a constantly burning ignition flame in said combustion chamber, means for guarding said flame-maintaining means so as to prevent extinction of the flame by the pressure of the said mixture, and means for feeding air to said flame-maintaining means.

7. A burner for exhaust gases comprising a combustion chamber, a mixing chamber communicating therewith, an exhaust gas inlet conduit connected with said mixing chamber, an air inlet conduit also connected with said mixing chamber, means for supplying exhaust gases to said gas inlet conduit, flame-maintaining means in said combustion chamber, and means for regulating the supply of exhaust gases so as to avoid impairment of the operation of said flame-maintaining means.

8. A burner for exhaust gases comprising a combustion chamber, a mixing chamber communicating with said combustion chamber, an exhaust gas inlet conduit for said mixing chamber, an air inlet conduit for said mixing chamber, a check valve controlling

the flow of air through said conduit, a burner in said combustion chamber, means for supplying fuel thereto, an air supply conduit for said last mentioned burner, and a check valve in the last mentioned air conduit so as to control the flow of air therethrough.

Signed at Albany, county of Albany, State of New York, this 13th day of December, 1927.

LOUIS C. HYATT.