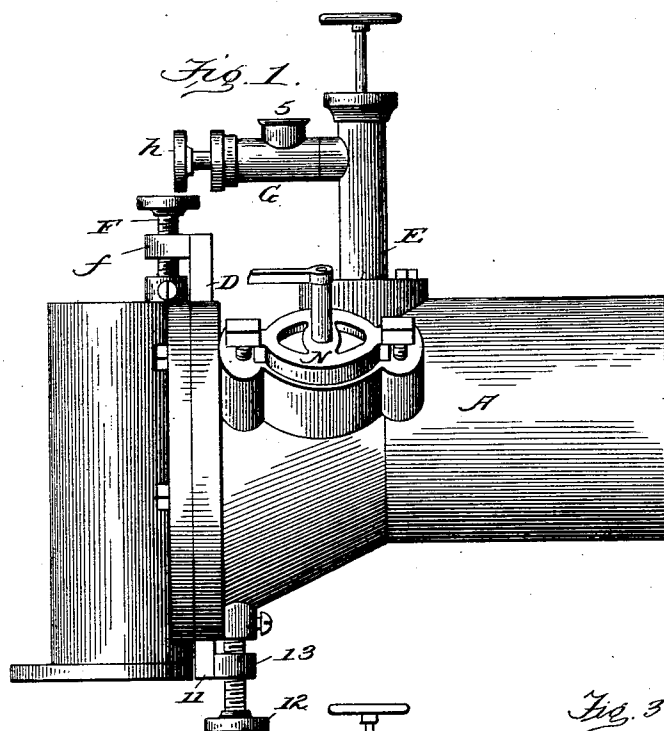
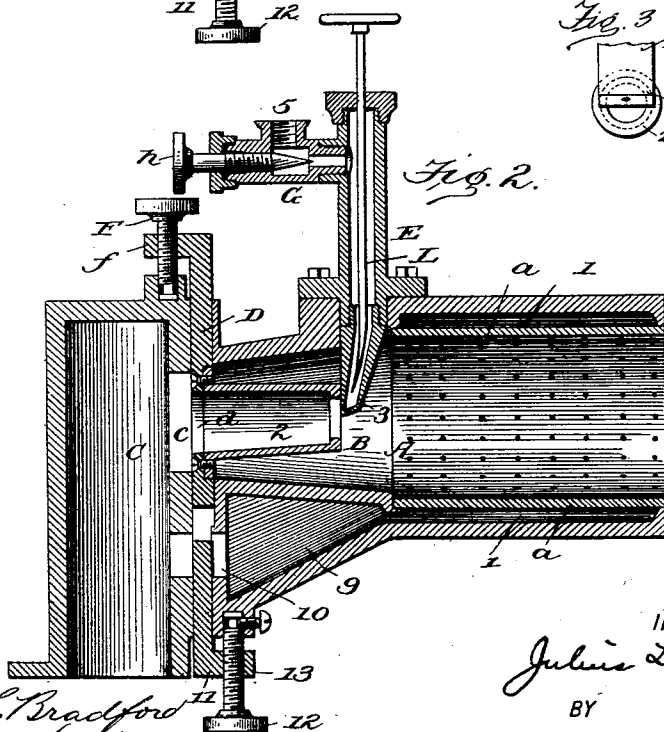
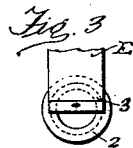


(No Model.)

J. LEEDE.
HYDROCARBON BURNER.

No. 588,155.

Patented Aug. 17, 1897.



WITNESSES

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UNITED STATES PATENT OFFICE.

JULIUS LEEDE, OF MINNEAPOLIS, MINNESOTA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 588,155, dated August 17, 1897.

Application filed December 7, 1895. Renewed January 22, 1897. Serial No. 620,286. (No model.)

To all whom it may concern:

Be it known that I, JULIUS LEEDE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in hydrocarbon-burners for furnaces, the object being to simplify the construction and increase the efficiency of this class of burners.

In burners of the type to which my invention relates the oil is delivered in an atomized or vaporized condition into a combustion-chamber, where it is oxidized or consumed, the atomization and oxidation being effected by blasts of air delivered as hereinafter described.

In the accompanying drawings, which illustrate my invention and form a part of this specification, Figure 1 represents a side view, and Fig. 2 a vertical longitudinal section. Fig. 3 is a front view of a fragment, showing the oil and air supply nozzles.

A designates the combustion-chamber, in the form of a hollow cylinder horizontally arranged and provided with a thickly-perforated lining *a*, separated from the wall of the chamber to leave an annular space or chamber 1 between the two, which chamber is closed at both ends. The combustion-chamber is open at the front end, and at the rear end it has a slightly-tapering extension B, forming a supplemental chamber into which the oil and the atomizing-blast are delivered, in which the atomization is effected, and from which the atomized oil passes into the combustion-chamber to be consumed. At the rear of the supplemental chamber B is an air chamber or passage C, which is designed to be connected with any suitable or adequate source of supply—as a pump, blower, or reservoir—to receive air therefrom under pressure. The passage or chamber C communicates with and delivers air to the supplemental chamber B through an opening *c*. Between the air-chamber C and the supplemental chamber B is a sliding plate D, having through it an opening *d* coincident with

but preferably somewhat smaller than the opening *c*, and carrying a tube or nozzle 2, which projects from around the opening *d* well forward into the supplemental chamber, as shown.

E is the oil-delivery tube, leading into the supplemental chamber B through the top thereof and provided at its delivery end with a flattened nozzle 3, which projects in front of the air-nozzle 2 and in close contact therewith. The plate D is vertically adjustable and is operated by a screw F, swiveled at the upper end of the air-chamber C and working through a projection *f* on the plate. By adjusting the plate up or down the nozzle 2 is raised or lowered relatively to the oil-nozzle 3, the latter thus in effect forming a valve to open and close to a greater or less extent, as may be desired, the front or delivery end of the nozzle 2 to regulate the volume of the air-blast delivered therethrough.

Fixed to the upper end of the oil-delivery tube E is a valve-chamber G, into and through which the oil is delivered from any suitable source of supply and from which it passes to the tube E, the flow being regulated by the middle valve *h*.

L is a cleaner-rod which projects down through the oil-delivery tube E to clear the oil-nozzle in the event of the latter becoming obstructed.

9 is an air-passage into which air is delivered from the air-chamber C through an opening 10 and which delivers air into the annular chamber 1, the air so delivered passing through the perforated lining *a* into the combustion-chamber to support the combustion therein. The opening 10 is controlled by a sliding valve or cut-off 11, operated by means of a screw 12, swiveled in the casing and working through a stud or projection 13 to regulate the volume of air delivered to the burner. Combustion is started through an opening N, provided for that purpose in the wall of the supplemental chamber, the said opening being closed as soon as ignition is effected. The cover of this opening is provided with peep-holes for observation purposes.

The operation of the apparatus described is as follows: The valve *h* is adjusted to admit the requisite quantity of oil and the air-nozzle is adjusted relatively to the oil-nozzle

to open or close it more or less, according to the blast required for the complete atomization of the oil; in other words, to proportion the blast of air to the supply of oil, a stronger blast being required as the oil-supply is increased. The blast of air impinging against the oil as it escapes from the nozzle 3 atomizes it and carries it forward into the combustion-chamber. The apparatus having been thus started, the vapor is ignited through the opening N, which is then tightly closed. The cut-off 11 is now adjusted to admit to the combustion-chamber, through the passage 9 and the perforated lining, the requisite supply of air to support combustion. The air entering the combustion-chamber in small jets from all directions penetrates and permeates the flame therein, and not only supplies the oxygen to support combustion, but compresses and condenses the flame toward the center and retards or holds back the forwardly-moving burning mass, giving time for complete combustion or oxidation within the combustion-chamber.

25 Having now described my invention, what I claim is—

1. In hydrocarbon-burners, the combination of a combustion-chamber, an air-chamber in the rear of said chamber, a vertically-adjustable air-conduit leading from the air-chamber and an oil-conduit arranged in front of the air-conduit to serve as a cut-off to regulate the flow of the air as the air-conduit is adjusted.

35 2. In hydrocarbon-burners, the combina-

tion of a combustion-chamber, an air-chamber in the rear of said chamber, a vertically-adjustable plate provided with an opening or passage between said chambers and a nozzle carried by the plate for directing air axially through the combustion-chamber, substantially as described.

3. In hydrocarbon-burners, the combination of a combustion-chamber having a perforated inner wall and an annular space around said wall, an air-chamber communicating with the combustion-chamber through one end of said chamber and through the annular space and a regulating-gate or cut-off between the air-chamber and the annular space, substantially as described.

4. In hydrocarbon-burners, the combination of a combustion-chamber having a perforated interior wall and an annular space around said wall, an oil-passage leading to one end of said chamber, an air-chamber communicating with the combustion-chamber through one end and past the oil-passage and through the annular chamber, an adjustable nozzle for regulating the volume of air to the end of the combustion-chamber and a gate or cut-off between the air-chamber and the annular chamber, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

JULIUS LEEDE.

Witnesses:

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F. C. O'HOLLAREN.