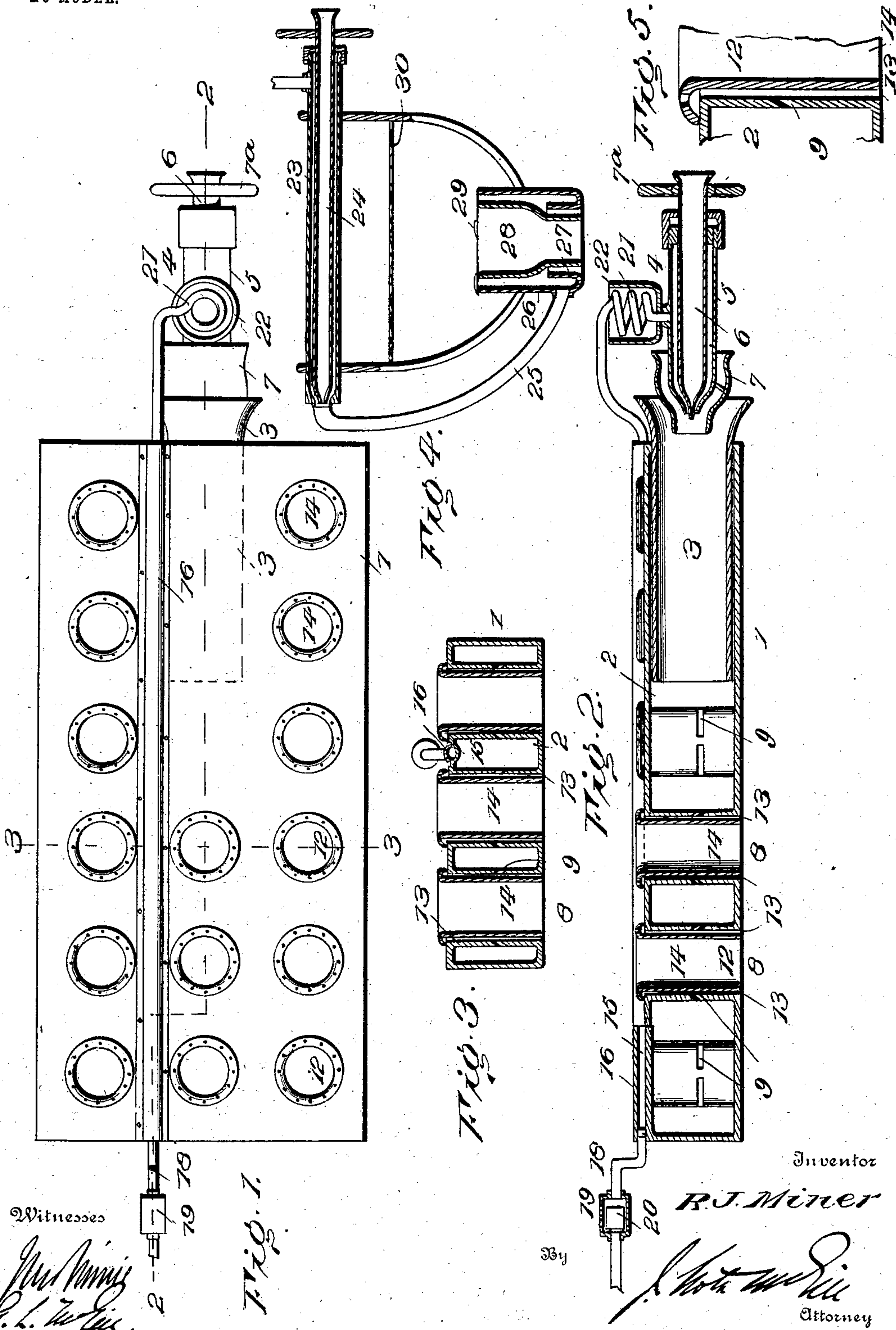


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R. J. MINER.
HYDROCARBON BURNER.
APPLICATION FILED JUNE 7, 1902.

NO MODEL.



UNITED STATES PATENT OFFICE.

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HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 724,911, dated April 7, 1903.

Application filed June 7, 1902. Serial No. 110,667. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. MINER, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare the following to be 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.

The object of this invention is to provide an improved hydrocarbon-burner especially designed for burning kerosene and by which a thorough combustion being obtained I am enabled to employ a burner or battery of burners of any size and insure the production of a blue flame with all danger of explosion and annoyance from objectionable odors entirely obviated.

A further object is to provide simple and highly-efficient means for preventing the roaring sound intermittently occurring with hydrocarbon-burners due to the backflow of the gas, thereby avoiding diminishing the flame. By my improvement in lessening or checking this backflow the oil is not entirely cut off and its normal supply will continue immediately upon the backflow being checked.

It is well known that perfect combustion of kerosene is impossible without a free and thorough admixture of oxygen. By my invention not only is air thoroughly mixed with the gas or vapor at several points in its passage to and before reaching the point of ignition, but additional air is supplied at such point, insuring thereby the complete consumption of gases, with a resultant blue flame, giving a high degree of heat.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view. Fig. 2 is a longitudinal sectional view on line 2 2, Fig. 1. Fig. 3 is a cross-sectional view on line 3 3, Fig. 1. Fig. 4 shows my invention as applied to a single burner. Fig. 5 is a detail.

Referring to the drawings, 1 designates the shell or casing of a battery of burners, such shell being composed of upper and lower plates connected at their ends and sides and

forming an inclosed gas-chamber 2. Into this chamber from one end extends a gas-supply tube 3, into which the gas is discharged from a mixer 4, arranged centrally in line therewith. This mixer is composed of an outer gas-tube 5, a central adjustable air-tube 6, and a second or outer air-tube 7, connected to tube 5 by a web or lateral flanges. The tube 6 may be adjusted by the turning of a hand-wheel 7^a to regulate the flow of the gas with a resultant control of the air drawn into such tube, the ends of the tubes 5 and 6 being tapered at their discharge ends. The gas passing through tube 5 entrains air through tube 6, and as the air and gas pass from these two tubes a further supply of air is entrained through the tube 7, into which the former tubes project, while as the now fairly-well-air-charged gas passes into the supply-tube 3 a still further quantum of air is drawn into the gas-chamber along with the gas.

8 designates a series of burner-openings extending vertically through the gas-chamber, preferably of cylindrical formation, the wall of each opening having an annular slot or slots 9 formed therein and extending diagonally upward from within the chamber toward the tops of the openings, so as to direct the passage of the gas upwardly. Each burner is composed of a tube 12, which between itself and the wall of its opening forms a passage-way 13, open to the atmosphere at its lower end and into which the gas enters through slots 9, the air rising in this passage-way thoroughly mixing with the gas at such slots and before reaching the point of combustion. The upper ends of the burner-tubes are flanged and extended over the burner-openings, such flanges having holes for the passage of the gas. The tubular body of the burner forms an air passage-way 14, through which air will pass to the flame.

15 designates a duct or passage-way extending longitudinally of the top plate of casing 1, through which the oil travels in its passage to the mixer and wherein it is converted into a gas. This duct is preferably formed by a removable plate 16, secured over a depression formed in the top plate of the casing. The oil-supply pipe 18 opens into the

duct at one end, and in this pipe is a cage 19, wherein is located a valve 20, the function of which is to automatically check the backflow of the gas, such valve, however, not entirely cutting off the forward flow of the oil, so that as soon as the flow back is checked the valve will immediately resume its normal position and allow a free passage. To the other end of the duct is connected one end of a coil 21, which opens into tube 5 of the mixer. Beneath this coil is a cup 22, wherein may be placed alcohol or its equivalent to serve as a torch or primer in starting the burner, the heat therefrom converting the oil in the coil into a gas before it reaches the mixer.

In practice after the initial conversion of the oil into gas the latter will pass out through the delivery end of tube 5 of the mixer, entraining the air through inner tube 6, and in passing into the supply-tube 3 additional air is drawn in through such tube as well as through the surrounding air-tube 7. The gas passing into the chamber 2 will find its exit through the diagonal openings formed by the slots 9, and passing upwardly through such openings around the burner-tube 12 will entrain air upwardly through passage-way 13 between such tubes and the walls of the burner-openings, with the result that before the gas reaches the perforated flange of the burner it will be well and heavily charged with air, insuring thereby the production of a blue flame. Air is also drawn inwardly by the flame at the point of combustion through the central opening 14 of the burner. The heating of the top plate of the burner-casing being effected by the time the torch or primer is burned out, the oil is converted into a gas in its passage through the duct 15.

From what has been said it will be observed that by the described arrangement I provide for the thorough admixing of oxygen with the oil gas, such admixture occurring at several different points before the gas reaches the burners, and that in addition thereto a further supply of air is drawn in by the flames through the central openings of the burners. Thus all the gases are consumed and a perfectly-blue flame of a high degree of heating capacity is obtained.

In Fig. 4 I have shown the application of my improvement to a single burner. In this form the oil is admitted to a pipe or tube 23, wherein it is converted into a gas by the heat of the burner, and its outlet-opening is controlled by an inner air-tube 24, such outlet-opening being connected by a tube 25 to a cylindrical casing 26, having a lower inner surrounding baffle-plate 27, causing the gas to pass upwardly between casing 26 and an inner casing 28, having upper flanges or lateral fingers 29, resting on the outer casing 26. Above the casings is a perforated plate or screen 30, where the ignition of the gases occurs, the heat of such gases serving to continuously generate the oil into gas in its transit through tube 23. This form of burner may

be used for heating flat-irons or for any desired purpose where one burner is alone sufficient.

The advantages of my invention are apparent to those skilled in the art. It will be specially observed that by means thereof a battery of burners of any size may be employed and a perfectly-blue flame produced by each burner of the series. This is due to the fact that in addition to the thorough admixture of the oxygen with the gas each burner has its own independent air-supply.

I claim as my invention—

1. In a hydrocarbon-burner having a gas-converting chamber and means for supplying air to the gas, a casing beneath the point of ignition having an air passage-way into which the gas enters and wherein the air and gas are intermingled before ignition, and a second air passage-way centrally of the burner through which air is supplied to the flame, as set forth.

2. In a hydrocarbon-burner having a gas-converting chamber and means for supplying air to the gas, a casing having upwardly-directed ports through which the gas passes below the point of ignition, an air-chamber into which such ports discharge and wherein the air and gas are intermingled before ignition, and a second air passage-way within the burner for supplying air to the flame, substantially as set forth.

3. In a hydrocarbon-furnace, a shell or casing having a battery of openings extending therethrough, the wall of each opening having a slot or slots facing upwardly, a burner-tube for each opening forming between itself and the wall of the latter an air-passage wherein the air and gas are intermingled before ignition, a second air-passage being formed in each burner for supplying air to the flames, means for converting the oil into gas, and a mixer opening into the chamber of said shell, said mixer having means for intermingling the air and gas before entering such chamber, substantially as set forth.

4. In a hydrocarbon-burner, a shell or casing having a battery of openings, the wall of each opening having a slot or slots facing upwardly, an oil duct or passage-way extending across the top of such shell or casing, a gas-supply tube leading into the chamber of said shell, a mixer connected to said duct or passage-way and having an air-inlet tube or tubes, said mixer opening into said gas-supply tube, and burners located in said battery of openings and forming between themselves and the walls of the openings air-passages wherein the air and gas are intermingled before ignition, as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ROBERT J. MINER.

Witnesses:

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FRANCIS S. MAGUIRE.