E. R. ANDERSON.

OIL BURNER.

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1,064,589.

Patented June 10, 1913.

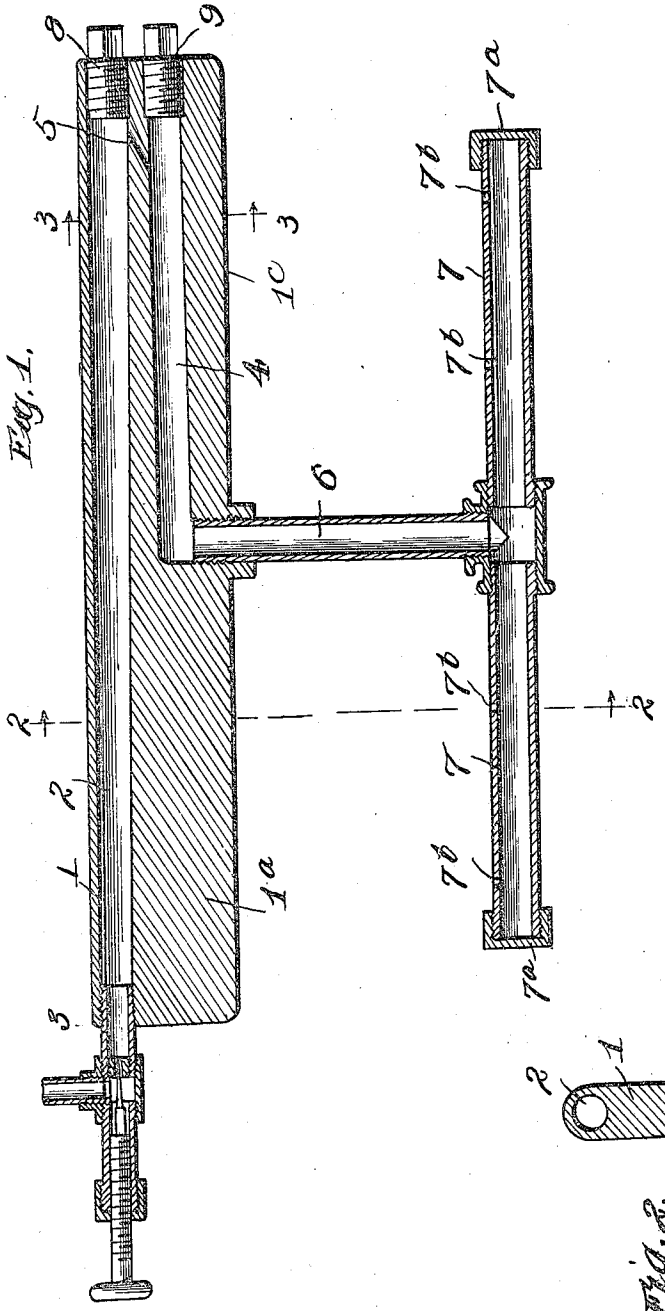

Fig. 1.

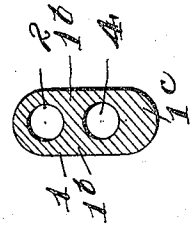

Fig. 3

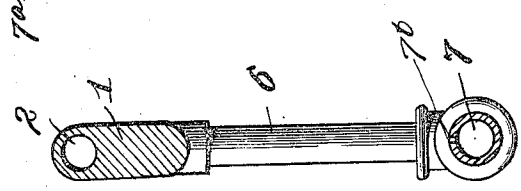

Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

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OIL-BURNER.

1,064,589. Specification of Letters Patent. Patented June 10, 1913.

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To all whom it may concern:

Be it known that I, EDWARD R. ANDERSON, a citizen of the United States, and resident of Blackstone, in the county of Nottoway and State of Virginia, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to burners for developing heat from the consumption of kerosene or other distillates of petroleum, and particularly to that type of such burners which utilize a portion of the heat to properly condition the fuel for efficient burning.

The invention has for its object to produce a device of simple and efficient construction and one in which carbonizing will be reduced to a minimum, but which may be conveniently cleaned when carbonizing takes place.

To these ends, the invention employs a fuel heater provided with a protracted channel extending substantially the length of the heater to provide a preliminary heating chamber and then returning to provide a secondary heating chamber beneath the preliminary heating chamber; fuel being admitted at one end of the preliminary heating chamber and being permitted to escape from the remote end of the secondary heating chamber, whence it is delivered to the burner; these chambers being preferably made in an integral casting with the secondary chamber beneath the primary chamber, so that the flame of the burner is prevented from impinging immediately against the wall of the primary chamber in which the oil is in a fluid state; the primary and secondary chambers being each provided with removable closures giving access to the chambers for cleaning them, and the passage between the chambers being so related to one of said closures as to be accessible through said closure. In the preferred embodiment, the secondary chamber underlies the primary chamber for a part only of the length of the latter, and to give protection to the primary chamber for the remainder of its length, the body of the heater is increased in thickness. This arrangement insures the advantages of having the fuel outlet at an intermediate position where it is more or less surrounded by the flame and, therefore, subjected to heating action and at the same time admitting of a pair of burner tubes being supported from a single connection with corresponding reduction in the number of connecting parts. In the preferred embodiment of the invention, the metal is distributed so as to provide a comparatively thin wall above the primary chamber and relatively thicker walls between the chambers and beneath the secondary chamber, so that the heating effect is more evenly distributed and the life of the device is greatly increased.

The invention will be fully understood upon reference to the accompanying drawing, in which—

Figure 1 is a vertical longitudinal section of the improved burner; Fig. 2 is a section on the line 2—2 of Fig. 1, and Fig. 3 is a section on the line 3—3 of Fig. 1.

1 represents the body of the burner which is constructed preferably of an integral casting having a primary heating chamber 2 with an oil inlet 3 at one end and with a secondary heating chamber 4 communicating with the chamber 2 through the port 5 at the other end. The chamber 4 underlies the chamber 5 and communicates at its end remote from the port 5 with the fuel discharge pipe 6 which carries the burner tubes 7. The chamber 4, particularly when it is desired to use a pair of burner tubes 7, extends but a part of the length of the chamber 2 in order that its outlet tube 6 may occupy an intermediate position, and in such case, the body 1 is provided with a thickened protecting portion 1^a beneath that portion of the chamber 2 which is not protected by the chamber 4. The upper wall of the chamber 2 is relatively thin, so that the burning gases which more or less surround the entire burner when used in a stove, for instance, will have an efficient heating effect upon the fuel of the primary chamber; but the side walls 1^b and the bottom wall 1^c are relatively much thicker, so that the impinging flame from the burner tube 7 cannot develop excessive heat on any restricted area of the heating chambers and cause undue carbonizing of the burner. Carbonizing is essentially a precipitation of mechanically suspended particles in the fuel and is aggra-

vated by too sudden raising of the temperature, as for instance by the liquid striking suddenly upon an excessively hot spot which immediately vaporizes the volatile portion of the fuel and leaves the relatively cooler particles of carbon adhering to the wall of the chamber. If heating can be carried on more uniformly and gradually so as to give time for raising the temperature of the mechanically mixed solid matters, precipitation is greatly reduced and such matters escape through the burner tubes and are consumed.

To facilitate cleaning the burner after long continued use, the chambers 2 and 4 are provided with end closures 8 and 9, preferably in the form of plugs which give access in a straight line with the chambers. The port 5 is located adjacent to one or both of these plugs so as to be accessible through the opening provided by removal of a plug and is preferably inclined toward one of the plugs to facilitate introducing a cleaning instrument. The outlet tube 6 and the burner tubes 7 with caps 7^a on the latter are all assembled by threading, so that the parts can be readily separated for cleaning.

If the chamber 4 extended the full length of the chamber 2, as for instance when the outlet tube 6 is at one end and a single burner tube 7 extends beneath the chamber 4, the thickened portion 1^a can be correspondingly reduced in length or omitted altogether.

In use, the burner will preferably be introduced in proper position in a fire-place or stove as is common with burners of this general type.

The burner tubes 7 will be provided with any desired number of small openings 7^b for escape of fuel suitably directed to develop any desired spreading of the flame.

The bottom of the chamber 2 is inclined from the intake 3 to the port 5, and the bottom of chamber 4 is inclined from the port 5 to the outlet 6 (conveniently attained by inclining the whole chamber), so that complete drainage results.

I claim:—

1. A burner for liquid fuels, comprising an elongated body constructed with substantially parallel primary and secondary heating chambers; the primary chamber extending the whole length of the burner, and being provided with a controllable fuel inlet at one end and an inter-chamber port of communication at the other end; the secondary heating chamber extending from said port of communication to the middle of the burner; an outlet tube extending perpendicularly to the middle end of the secondary chamber, and in the plane of the two chambers, and burner tubes extending oppositely from the end of said outlet tube, in the plane of the two chambers, and adapted to discharge fuel on opposite sides of the outlet tube and toward the chambers.

2. A burner for fluid fuels comprising an elongated body constructed with superposed primary and secondary heating chambers with a fuel inlet at one end of the primary chamber and a port establishing communication between the chambers at the end remote from said inlet; a fuel outlet leading from the secondary chamber at the end remote from said port, and a burner tube supplied by said fuel outlet adapted to direct its flame toward the secondary chamber; said secondary chamber extending but a portion of the length of the primary chamber, and there being a protecting wall of increased thickness beneath that portion of the primary chamber which extends beyond the secondary chamber.

3. A burner for fluid fuels comprising an elongated body constructed with superposed primary and secondary heating chambers with a fuel inlet at one end of the primary chamber and a port establishing communication between the chambers at the end remote from said inlet; a fuel outlet leading from the secondary chamber at the end remote from said port, and a burner tube supplied by said fuel outlet adapted to direct its flame toward the secondary chamber; said secondary chamber extending but a portion of the length of the primary chamber, and there being a protecting wall of increased thickness beneath that portion of the primary chamber which extends beyond the secondary chamber; the fuel outlet from the secondary chamber being located at an intermediate point in the burner body and the burner tube being extended on opposite sides of said fuel outlet.

4. A burner for fluid fuels comprising an elongated body constructed with superposed primary and secondary heating chambers with a fuel inlet at one end of the primary chamber and a port establishing communication between the chambers at the end remote from said inlet; a fuel outlet leading from the secondary chamber at the end remote from said port, and a burner tube supplied by said fuel outlet adapted to direct its flame toward the secondary chamber; said primary and secondary chambers being provided with end closures; the port between the chambers being adjacent to an end closure and inclined toward the same.

5. A burner for fluid fuels comprising an elongated body constructed with superposed primary and secondary heating chambers with a fuel inlet at one end of the primary chamber and a port establishing communication between the chambers at the end remote from said inlet; a fuel outlet leading from the secondary chamber at the end remote from said port, and a burner tube supplied

by said fuel outlet adapted to direct its flame toward the secondary chamber; said burner body being constructed with a relatively thin wall above the primary chamber and with thicker walls between the chambers and beneath the secondary chamber.

The foregoing specification signed at Washington, District of Columbia, this 26th day of February, 1913.

EDWARD R. ANDERSON.

In presence of two witnesses:
HERVEY S. KNIGHT,
HERBERT H. KNIGHT.