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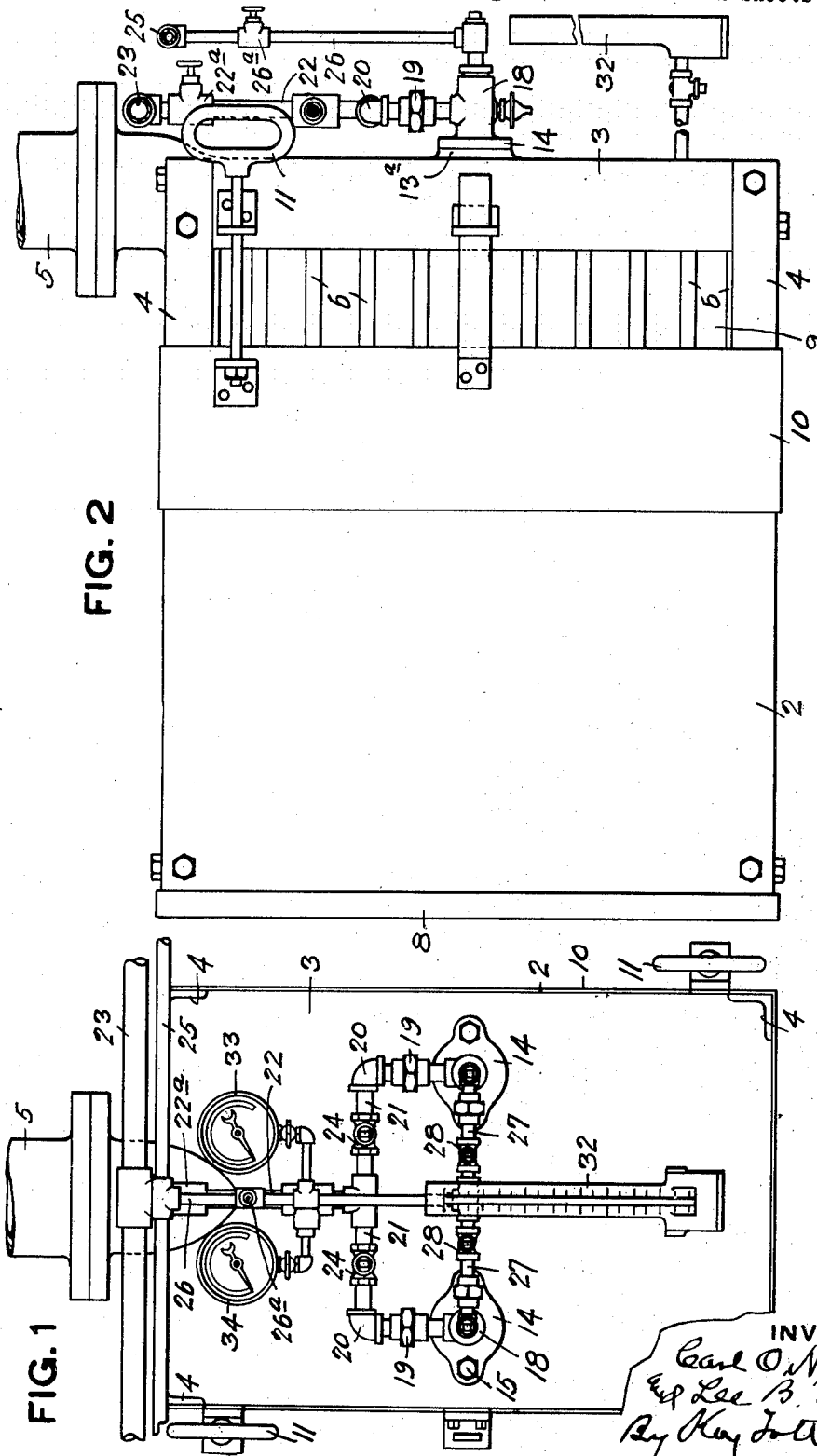
1,476,913

C. O. NORDENSSON ET AL

COMBINATION GAS AND OIL BURNER

Filed Aug. 9, 1920

2 Sheets-Sheet 1



INVENTORS

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 Exp Lee B. Metzler
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FIG. 3

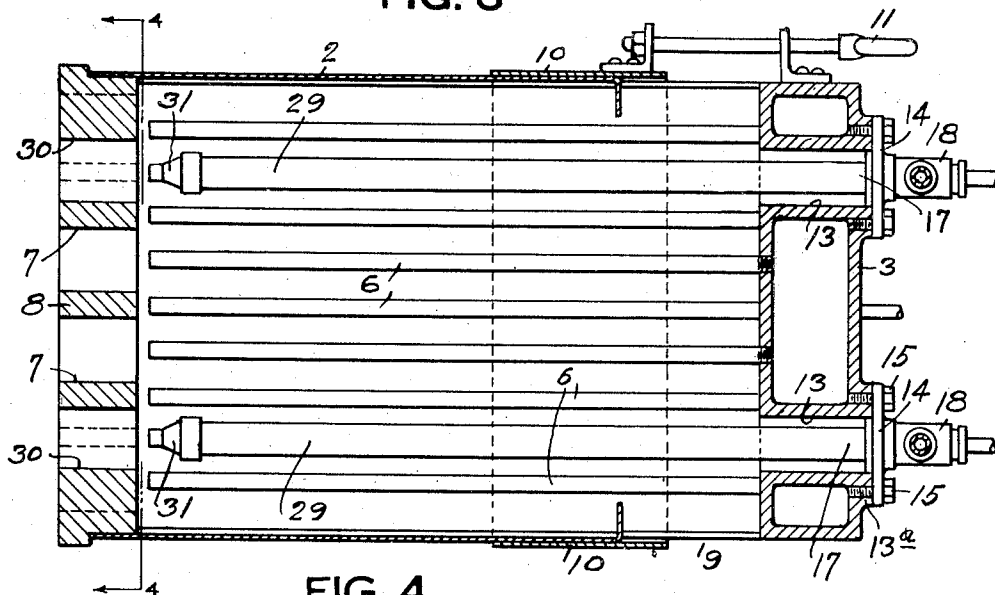
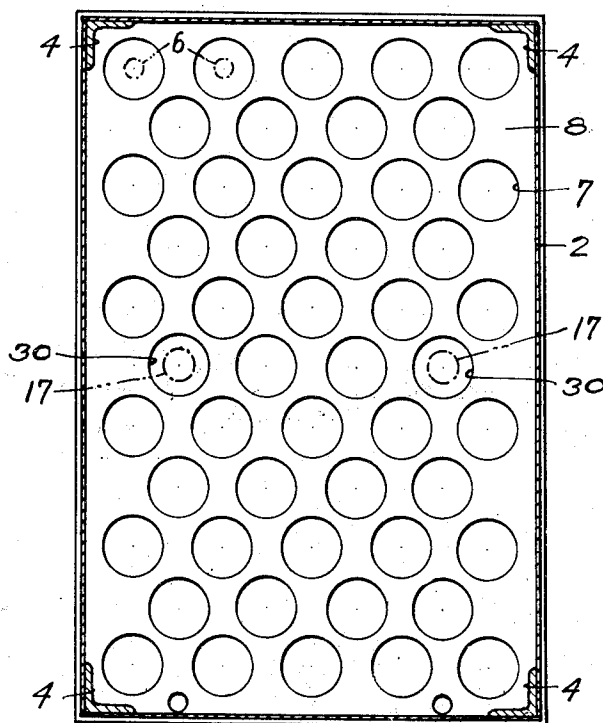


FIG. 4



INVENTORS

Carl O. Nordensson
and Lee B. Kretzler
By Kay Tatum Brown, atty.

UNITED STATES PATENT OFFICE.

CARL O. NORDENSSON, OF PITTSBURGH, PENNSYLVANIA, AND LEE B. METTLER, OF OKLAHOMA, OKLAHOMA, ASSIGNORS TO DUQUESNE BURNER SERVICE CO., OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF DELAWARE.

COMBINATION GAS AND OIL BURNER.

Application filed August 9, 1920. Serial No. 402,290.

To all whom it may concern:

Be it known that we, CARL O. NORDENSSON and LEE B. METTLER, citizens of the United States, and residents of Pittsburgh, in the county of Allegheny and State of Pennsylvania, and of Oklahoma city, Oklahoma County, and State of Oklahoma, respectively, have invented a new and useful Improvement in Combination Gas and Oil Burners; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to a combination gas and liquid-fuel burner.

In Letters Patent of the United States No. 1,322,131, Nov. 18, 1919, there is illustrated and described a gas-burner comprising, generally stated, a suitable shell or casing, a mixing plate at the discharge end of said casing having openings therein, a box at the front end of said casing, pipes leading from said box into said casing adjacent to said openings in said mixing plate and registering therewith, said casing having an air-inlet adjacent said box, a valve controlling said air inlet, and a valve controlling the supply of gaseous fuel to said box.

These burners are now used with great success, but sometimes have proved inefficient by reason of reduced pressure of gas due to the low pressure in the lines where the gas in a certain territory is gradually giving out, or in cold weather, where the consumption is greater than the supply.

The object of my invention is to provide a combination gas and liquid-fuel burner where the liquid-fuel may be employed to help out when the gas pressure is low, so that the combination of the two will give the required heat for the boiler or other furnace.

In the accompanying drawing, Fig. 1 is a front elevation of our improved burner; Fig. 2 is a side elevation; Fig. 3 is a longitudinal section; and Fig. 4 is a section on the line 4-4, Fig. 3.

In the drawing the numeral 2 designates a suitable shell or casing made of sheet-metal of proper gauge. At the outer end of the casing 2 is the gas-box 3 which is supported by the angle-bars 4 connected to the casing 2. The box 3 is provided with the gas-inlet 5, and connected to said box are the gas-pipes 6 of any suitable number, said gas-pipes ex-

tending into the casing 2 to the rear end thereof adjacent to the openings 7 formed in the cast-iron or refractory mixing-plate 8. The pipes 6 register with the openings 7 so that the combined air and gas passes through said openings, the air and gas being kept separate up to within a few inches of the combustion chamber, so that a very complete mixture is obtained.

The air for combustion is supplied through the opening 9 which is controlled by the slide-valve 10 encircling the casing, and movement is imparted to said slide-valve by the handles 11, so that the quantity of air admitted to the casing may be regulated in proportion to the amount of gas.

Passages 13 are formed extending through the gas-box 3, the entrance to said passages being closed by the flanges 14 by which the oil-burners 17 are secured to bosses 13^a on said box by means of the screws 15. At the outer ends of the liquid-fuel burners 17 are the connections 18 which are connected up by the couplings 19 and elbows 20 to the pipes 21 which, in turn, are connected to the pipe 22 connected up to the main liquid-fuel supply-pipe 23. A needle valve 22^a is provided for regulating the flow of the liquid-fuel.

The valves 24 in the pipe 21 control the supply of liquid-fuel to the liquid-fuel burners. The steam line 25 has the pipe 26 connected therewith, and at the lower end of said pipe 26 are the branch pipes 27 with the valves 28 which supply steam to the connections 18 of the liquid-fuel burners.

In the pipe 26 is a suitable needle valve 26^a which regulates the supply of steam to the liquid-fuel burners.

By closing the valves 24 and 28 any one of the liquid-fuel burners may be cut off from the fuel and steam supply, and said burner may then be cleaned, renewed or repaired by disconnecting the couplings 19.

The elongated portion 29 of the liquid-fuel burner extends into the casing 2 and like the gas-pipes 6 terminates adjacent to the opening 30 in the mixing plate 8, and registers therewith, a suitable nozzle 31 being provided at the inner end of said elongated portion 29.

The openings 7 in the mixing plate 8 for supplying the air for the proper combustion of the gas in the pipes 6 surrounding the

opening 30 assists in providing the air for the proper combustion of a liquid fuel which is ejected from the nozzle 31 at a high velocity and, being driven through the opening 30 expands rapidly on its discharge from said opening into the furnace where the combustion takes place.

A suitable gas-pressure gauge 32 is provided as well as a steam-pressure gauge 33, and an oil-pressure gauge 34.

When our improved burner is in use and the gas and liquid fuel are being employed simultaneously, the gas will pass from the box 3 through the pipe 6, whence it is discharged through the openings 7, combining with the air entering the opening 9, where the combustion takes place. At the same time, liquid-fuel is being forced by steam through the liquid-fuel burners and is discharged at high velocity from the nozzle 31 through the openings 30. The vaporized liquid-fuel passes at high velocity through the openings 30 and expands quickly upon leaving said openings where it combines with the air passing through the openings 7, so that the combustion is very complete and a high heat developed.

By our invention, we provide, therefore, a combined oil and liquid-fuel burner which can be used with great success in localities where it is often necessary to resort to liquid-fuel to help out with the gas, where the pressure drops due to failure of supply or to weather conditions. The liquid-fuel is brought into use by opening the valves in the oil and steam line and no preparation is necessary to bring the liquid-fuel burner into active service.

What we claim is:

1. In a combined-oil and gas burner, the combination of a suitable shell or casing, a mixing-plate at the discharge end of said casing having openings therein, a box at the front end of said casing, gas pipes leading from said box into said casing adjacent to said openings in said mixing-plate and registering therewith, said casing having an air-inlet adjacent said box, a valve controlling said air-inlet, said box having passages extending therethrough, liquid-fuel burners passing through said passages, and adjacent to openings formed in said mixing plate and registering therewith.

2. In a combined oil and gas burner, the combination of a suitable shell or casing, a mixing-plate at the discharge end of said casing having openings therein, a box at the front end of said casing, gas pipes leading from said box into said casing adjacent to said openings in said mixing-plate and registering therewith, said casing having an air-inlet adjacent said box, a valve controlling said air-inlet, said box having passages extending therethrough, liquid-fuel burners passing through said passages, and nozzles at the inner ends of said fuel burners adjacent to and registering with openings formed in said mixing plate.

In testimony whereof, we the said CARL O. NORDENSSON and LEE B. METTLER, have hereunto set our hands.

CARL O. NORDENSSON.
LEE B. METTLER.

Witnesses:

ROBT. D. TOTTEN,
M. C. JAY.