Feb. 10, 1925. 1,526,227

J. J. LAUSTER

LIQUID FUEL HEATER

Filed March 24, 1924 2 Sheets-Sheet 1

Fig. 1.

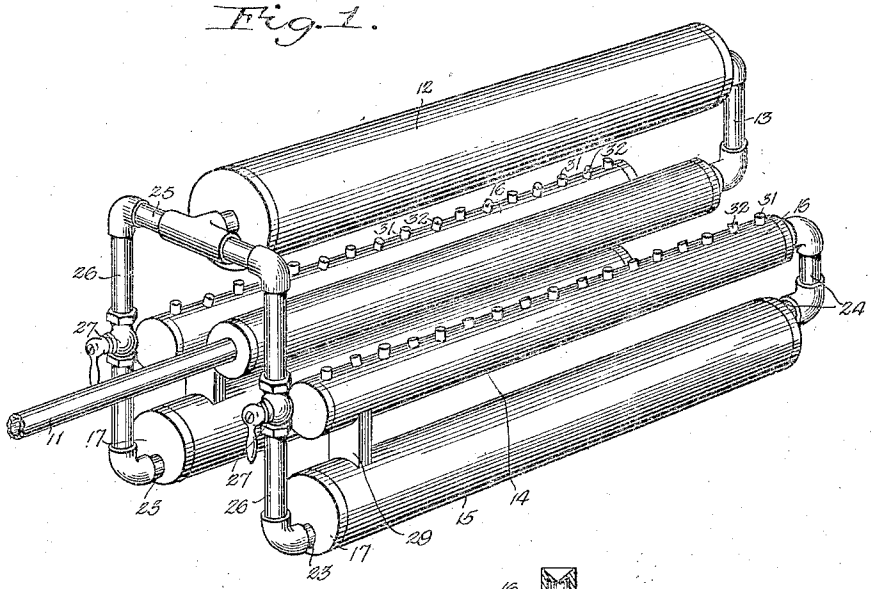


Fig. 3.

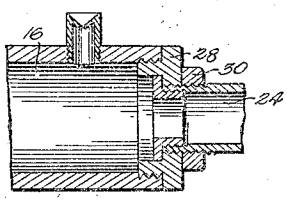
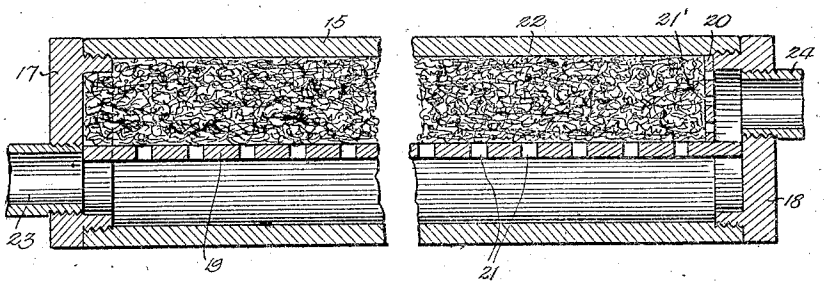


Fig. 2.



WITNESSES

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Fig. 4.

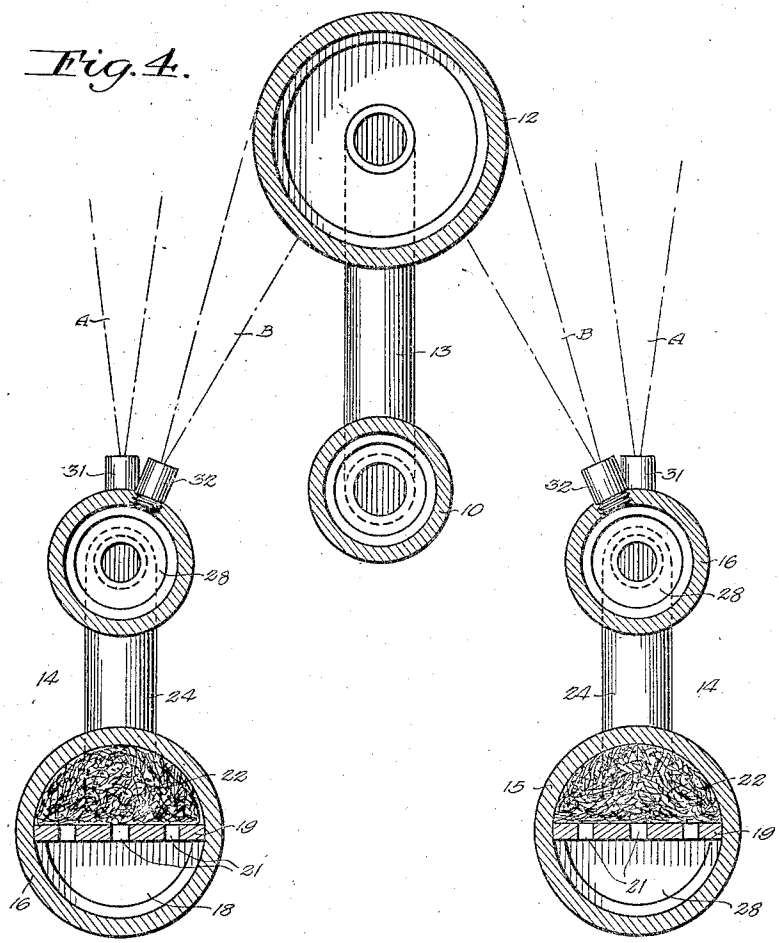
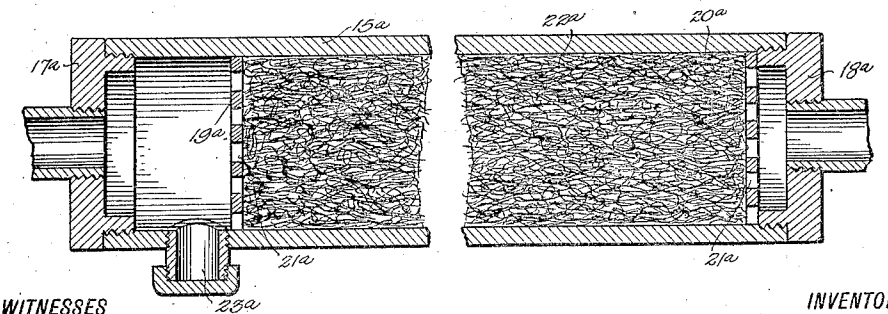


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN J. LAUSTER, OF BROOKLYN, NEW YORK.

LIQUID-FUEL HEATER.

Application filed March 24, 1924. Serial No. 701,468.

To all whom it may concern:

Be it known that I, JOHN J. LAUSTER, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Liquid-Fuel Heater, of which the following is a full, clear, and exact description.

This invention has relation to heating devices and has particular reference to liquid fuel heating devices of the type which are adapted for installation in the fire box of a steam, hot water, hot air, or other furnace, to take the place of coal, coke, or other fuels of this nature.

In devices of this character now in general use in which crude oil is usually employed as the fuel, and which is vaporized to form a gas, no means has heretofore been provided for regulating the same to prevent overvaporization of the fuel, and it is therefore one of the objects of the present invention to provide in a device of this character a means for regulating the same to effect a proper vaporization whereby the best results are obtainable.

As a further object the invention contemplates in a device of this character a means for effecting the cleansing and purification of the gas for the purpose of preventing carbon particles or other foreign matter from reaching the burner and clogging the same.

The invention furthermore comprehends in a device of the character described a plurality of burner units which are capable of independent operation whereby upon throwing of one or more out of operation the heat may be regulated to the desired degree.

As a still further object the invention aims to provide a heating device of the character set forth which is comparatively simple in its construction and mode of operation, which is inexpensive to manufacture and produce, and which is thoroughly reliable and highly efficient in its purpose.

With the above recited and other objects in view, the invention resides in the novel construction set forth in the following specification, partciularly pointed out in the appended claims and illustrated in the accompanying drawings, it being understood that the right is reserved to embodiments other than those actually illustrated herein to the full extent indicated by the general meaning of the terms in which the claims are expressed.

In the drawings—

Figure 1 is a perspective view illustrating a heating device constructed in accordance with the invention.

Fig. 2 is a longitudinal sectional view through one of the purifying members constituting a part of the device.

Fig. 3 is a fragmentary longitudinal sectional view through one of the burner members of the device.

Fig. 4 is an enlarged cross sectional view through the device.

Fig. 5 is a longitudinal sectional view through a purifying member embodying a modified form of the invention.

Referring to the drawings by characters of reference the device includes an initial receiving and preheating member 10 with one end of which the liquid fuel supply pipe 11 communicates. The member 10 is preferably of tubular or cylindrical formation and extends from the front to the rear of the device. A vaporizing drum 12 is arranged in superposed relation to the member 10 and substantially parallel thereto. The rear end of the member 10 communicates with the rear end of the vaporizer drum 12 by a conduit pipe 13. A plurality of purifying and burner units designated generally by the reference character 14 are arranged in parallel relation to each other and in a plane below the initial receiving and preheating member 10. Each of the units 14 include a purifier member 15 which is of substantially cylindrical formation and a superposed cylindrical or tubular burner member 16 in spaced parallel relation thereto. The purifier or cleansing members 15 are closed at their opposite ends by closure caps 17 and 18. In the preferred embodiment illustrated in Fig. 2 the purifier member is provided with a horizontal partition wall 19 extending from the front to the rear end and provided adjacent its rear end with a vertical partition wall 20. The walls 19 and 20 are perforated as at 21 and 21′ respectively and serve to house in the upper portion of the member 15 steel wool or any other similar substance 22. The forward end cap 17 has threadedly engaged therein an intake pipe 23 which communicates with the interior of the member 15 below the horizontal partition wall 19. The rear end cap 18 has threadedly engaged therein an outlet

or discharge conduit pipe 24 which communicates through the perforated vertical wall with the upper compartment containing the steel wool or other purifying substance. The vaporizer drum communicates with a manifold or distributor pipe 25 at its forward end and the manifold or distributor pipe communicates with the intake pipes 23 of the purifier members through a series of branch pipes 26 in which regulating and cut-off valves 27 are arranged. The outlet or discharge pipes 24 which lead from the rear end of the purifier members 15 extend upwardly and are threadedly engaged in the rear closure caps 28 of the burner members 16. The forward ends of the burner members 16 are supported by bearing elements 29 which project upwardly from purifying members 15 whereby the burner member 16 may be rotated with respect to the pipes 24. A binding nut 30 coacts respectively with the pipes 24 and the caps 28 at the rear end of the burner member 16 to maintain the same in their rotated or adjusted relation. The burner members 16 are each provided with a row or series of substantially vertically projecting burner tips 31 and a series or row of inwardly or laterally inclined burner tips 32.

In use and operation of the device the crude oil or other liquid fuel is fed to the initial receiving and preheating member 10 where it is partially heated and then travels through the conduit pipe 13 upwardly and into the rear end of the vaporizing drum 12. The vaporized fuel in the form of a gas is then discharged from the forward end of the drum 12 to the distributor pipe 25 where it descends through the pipes 26 and valves 27 into the inlet pipes 23 at the forward end of the purifying or cleaning members 15. The gas passes from the lower compartment of the purifying members 15 through the openings or apertures 21 and horizontal wall, where the carbon particles or other foreign matter is stripped therefrom by the steel wool or cleansing substance 22. The gas then escapes through the apertures 21′ in the vertical wall 20 and thence through the pipes 24 to the burner member 16 and through the tips 31 and 32. The jets or flames A from the tips 31 are projected upwardly while the jets or flames B from the tips 32 are directed laterally at an inclination and upwardly against the opposite sides of the vaporizer drum 12 in order to produce the required heat for effecting the vaporization of the preheated liquid fuel. By rotating the burner members 16 the desired portion of the flames or jets B may be played upon the walls of the vaporizer member 12 to secure the best results. After the rotation or adjustment of the members 16, the binding nuts 30 are employed to retain said members in their properly adjusted position. By manipulating the cut-off valves 27 the number of units 14 which are desired may be thrown out of operation. For instance, when it is desired to cut down the heat at night, one of the units 14 is thrown out of operation and the remaining unit will produce a substantially reduced heat.

In the modified adaptation of the invention illustrated in Fig. 5 the purifier member 15^a which is of tubular or cylindrical formation is closed at its front and rear ends by closure caps 17^a and 18^a. A pair of vertical front and rear walls 19^a and 20^a are arranged within the member 15^a and are provided with perforations 21^a to define a compartment for the reception of the steel wool 22^a or other similar purifying substance. The front wall 19^a is spaced from the closure cap 17^a and a depending clean-out well 23^a communicates with the space or compartment between the front closure cap 17^a and the front partition wall 19^a.

From the foregoing it will thus be seen that a liquid fuel heater of the character set forth has been provided which affords means for accurately regulating the vaporization of the fuel, which provides means for cleansing or purifying the gas, and which admits of regulation of the heater proper to reduce the temperature when desired.

I claim:

1. In a liquid fuel heating device of the character set forth, an initial receiving and preheating member having communication with a source of fuel supply, a superposed vaporizer having communication with the initial receiving and preheating member, a plurality of burner units, independent means for establishing communication between the burner members and the vaporizer, and independent means for rotatably adjusting said burner members whereby to direct the flame jets therefrom partially or wholly against the walls of the vaporizer to regulate the heating of the same and the extent of the vaporizing action thereof.

2. In a liquid fuel heating device of the character set forth, an initial receiving and preheating chamber having communication with a source of fuel supply, a superposed vaporizer having communication with said chamber and a plurality of units each of which includes a purifier member, a superposed burner member, independent means for establishing communication between said units and the vaporizer, and independent means for rotating the said burner members being mounted for independent rotation whereby to direct the flame jets therefrom partially or wholly against the walls of the vaporizer in order to regulate the heating of the same and the consequent extent of the vaporizing action.

3. In a liquid fuel heating device of the character set forth, a tubular member constituting an initial receiving and preheating chamber having communication at its forward end with a source of fuel supply, a superposed relatively enlarged tubular member arranged parallel thereto constituting a vaporizing drum, a conduit establishing communication between the rear ends of said members, a manifold outlet communicating with the forward end of the vaporizer drum, a plurality of units arranged in side by side relation in a plane below the preheater and vaporizer, valved conduits extending from the manifold outlet to said units, said units each including a subterposed purifier member and a superposed burner member, the said burner members being independently rotatable whereby to direct the jets of flame therefrom partially or wholly against the walls of the vaporizer to regulate the heating of the same and the extent of the vaporizing action, and said purifier members having a compartment therein in which a purifying substance is arranged for removing the carbon particles or other foreign matter from the vaporized fuel prior to its entrance to the burner members.

4. In a liquid fuel heating device of the character set forth, an initial receiving and preheating member having communication with a source of fuel supply, a superposed vaporizer having communication with the initial receiving and preheating member, a plurality of burner units having a plurality of longitudinal rows of angularly disposed burner tips, and independent means for rotating the burner members whereby to partially or wholly direct the flame jets from the burner tips against the walls of the vaporizer to regulate the heating of the same and the extent of the vaporizing action.

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