Jan. 8, 1924. 1,479,868

L. F. NOCK

OIL BURNER

Filed April 26, 1922 2 Sheets-Sheet 1

Fig. 1

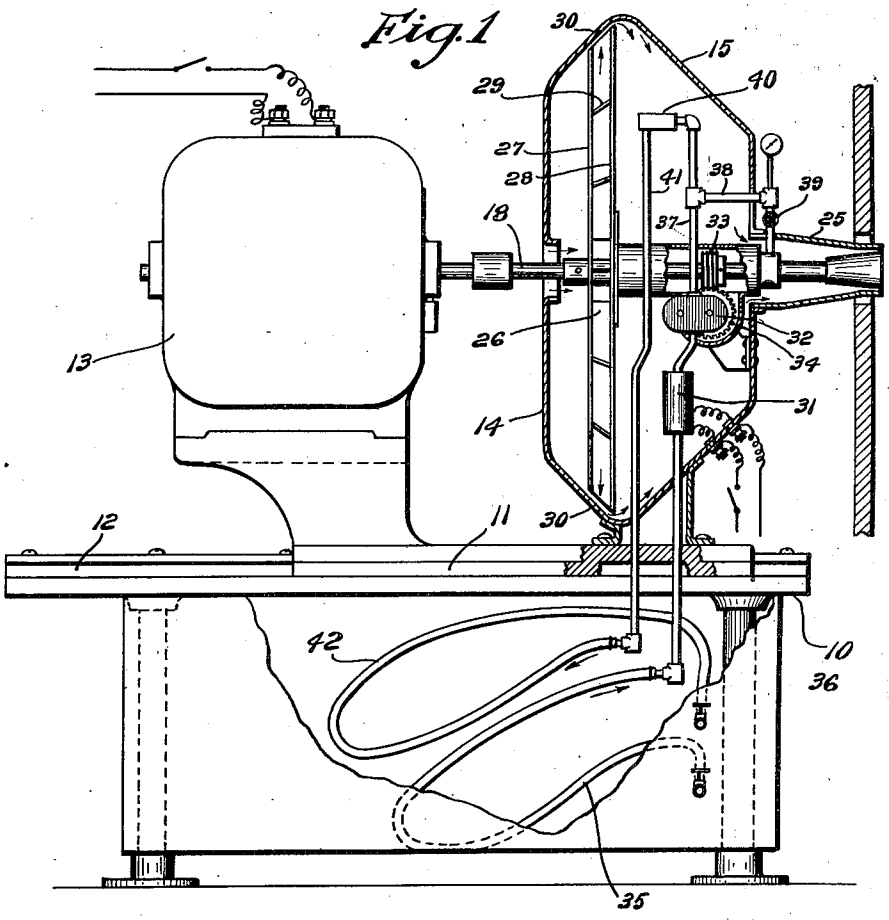
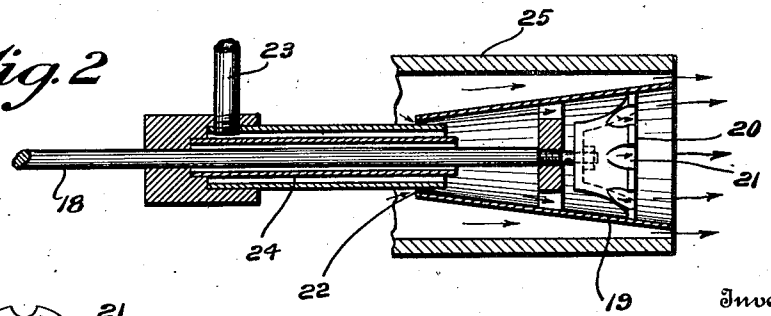


Fig. 2



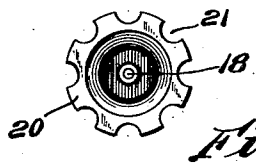


Fig. 3

Inventor

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Jan. 8, 1924. **1,479,868**

L. F. NOCK

OIL BURNER

Filed April 26, 1922 **2 Sheets-Sheet 2**

Fig. 4

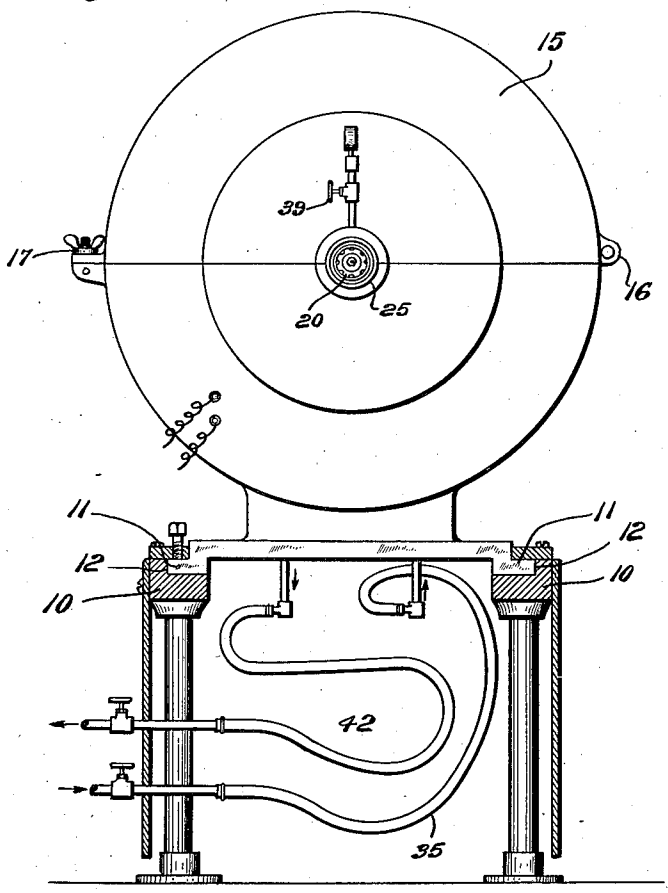
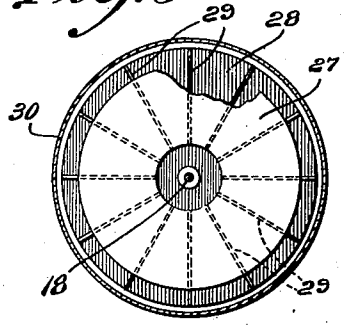


Fig. 6



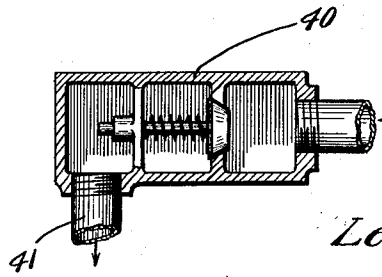


Fig. 5

Inventor

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Patented Jan. 8, 1924. 1,479,868

UNITED STATES PATENT OFFICE.

LEO F. NOCK, OF EAST GREENWICH, RHODE ISLAND.

OIL BURNER.

Application filed April 26, 1922. Serial No. 556,799.

To all whom it may concern:

Be it known that I, LEO F. NOCK, a citizen of the United States, residing at East Greenwich, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Oil Burners, of which the following is a specification.

This invention relates to improvements in hydrocarbon burners for forcing liquid fuel, such as crude oil, through a rotary spray burner into the heater, and one of the objects of this invention is to provide a motor-driven nozzle for spraying fuel, and a blower for supplying air under pressure to the nozzle, a pump for forcing the liquid fuel through the nozzle and means for highly heating the fuel before forcing it through the burner system for the purpose of thinning the fuel and reducing the force required to drive the fuel to the burner.

A further object of the invention is to provide a casing in which the pump and blower are mounted, the casing also serving as a means for directing the air from the blower to the nozzle.

A still further object of the invention is the provision of a base on which the motor and the casing with its contents are mounted, to provide a complete unit which may be readily moved to and from operative position when desired for inspection and repairs.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a side elevation in section illustrating my improved hydrocarbon burner apparatus all mounted as a unit upon a movable base.

Figure 2 is an enlarged view of the burner nozzle.

Figure 3 is a detailed front view of the spraying head.

Figure 4 is an elevation looking at the delivery end of the apparatus, and showing the ways in which the same is mounted.

Figure 5 is an enlarged sectional view of the relief or by-pass control valve.

Figure 6 is a sectional view through the casing showing the blower or fan.

It is found in practice to be of advantage in the construction and operation of hydrocarbon burners of this character to provide a unitary structure adapted to be readily adjusted towards and from the heater in order to nicely regulate the amount of air to be drawn in around the outside of the neck portion, to regulate combustion and also to be able to remove the whole from the intense heat after shutting down and when so removed the casing may be opened up for inspection and repairs, also to mount the operating mechanism within a protecting casing and to also provide means whereby that casing will serve to inclose the blower-fan and conduct the air therefrom to the burner nozzle, and the following is a detailed description of one means by which these results may be accomplished:

With reference to the drawings, 10 designates the support for my improved burner unit, in which is slidably mounted a base-plate 11 in the ways 12, a binding screw 9 being provided for locking the device in adjusted position. On the outer end of this plate, I have mounted a driving motor 13 and on the inner end of the plate I have mounted an inclosing casing 14 for the rapidly moving parts of the apparatus, which casing is preferably divided horizontally, its upper portion 15 being hinged as at 16 on one side and is provided with a clamp 17 on its opposite side by which it may be secured in closed position.

In this casing is mounted a central driving shaft 18 designed to be rapidly driven by motor 13, and on the inner end of this shaft is mounted a spray nozzle 19. This nozzle is provided with a spray head 20 notched on its periphery as at 21 to permit the passage and cause the breaking up of the fuel into a spray as forced therethrough.

The size of these notches may be varied in different heads to properly act upon fuel of different characters.

This nozzle is preferably made in a tapering form being opened slightly at its outer end 22 to admit a small amount of air to enter it at this end, the oil entering through the supply pipe 23 and the annular channel 24, the whole nozzle being mounted within an air-conducting neck 25 which is preferably tapering to control the amount of air that shall be drawn in around its outside by a longitudinal adjustment of the whole device.

On the shaft 18 and within the casing proper, I have mounted a fan or blower 26

which is preferably formed of two spaced apart plates 27 and 28 between which are set a plurality of radially-disposed blades 29, the plate 27 being of slightly smaller diameter than plate 28, and the wall 30 of the casing is preferably located close to the periphery of the blower and on an angle thereto whereby the air as forced radially from the blower impinges against the angular face of this wall from which it is deflected forwardly and conducted along the outer wall of the casing down through the nozzle inclosing neck 25 to supply the burner flame with the necessary oxygen.

In this protecting casing is preferably mounted all of the operating mechanism including the heating element 31 and a pump 32 which latter is driven at a comparatively slow speed from the worm 33 on the shaft 18 through the worm gear 34.

In feeding the burner oil is drawn in by a pump 32 from a source not shown through the flexible tubing 35, pipe 36 and heater 31 and passed through the pump out through pipe 37, pipe 38 and valve 39 and short pipe 23 into the spray nozzle, the amount permitted to pass into this nozzle being controlled by a hand-operated valve 39 and the surplus fuel or that portion which is pumped but not used, is passed back through a by-pass valve 40, pipe 41 and flexible tube 42 to the main supply tank (not shown).

The oil in passing through the electric heating unit 31 is raised nearly to the flashing point which serves a number of essential, purposes first, it materially reduces the power required to drive the pump as the heat of the oil thins it to such an extent that it is very readily passed through the pump and by it is forced through the system to the nozzle. Then again by pre-heating the oil it is much more readily broken up and atomized and its particles may be more thoroughly mixed with the air and is more completely consumed leaving less carbon deposit.

By connecting the supply pipes with flexible tubing the base-plate carrying the burner mechanism as a unitary structure is adapted to be readily moved forwardly and back to and from operating position which is found to be of advantage in devices of this character as above described.

Then again by mounting the device on a base of its own independently of the heater the same runs much more quietly than when supported on the walls of the heater as is the case with some devices of this character.

My improved burner is very simple and practical in construction, is very efficient in its operation and may be made in any size and adapted to be employed either in a household heater or in units of larger sizes.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. A hydrocarbon burner comprising a casing having an oil supply nozzle, a blower, and a tubular tapered neck for conducting air from the blower to the furnace surrounding said nozzle and projecting into an opening in the furnace, said casing with its tapered neck being movable toward and from the furnace opening to control the admittance of the surrounding air to the firepot to assist in controlling the heat of the furnace.

2. A hydrocarbon burner comprising a casing having a tapered air conducting tubular neck adapted to extend through an opening in the furnace, a rapidly rotatable spray nozzle mounted in said neck, a blower in said casing for supplying air under pressure through said neck to said nozzle, a pump for forcing the fuel through said nozzle, said casing being so mounted that it may be moved bodily with its contents relatively to the furnace opening to regulate the amount of air to be drawn in through said opening.

3. A hydrocarbon burner comprising a slidable base, a motor, a supply nozzle and a blower all mounted in said base, means for supplying oil to said nozzle, a blower inclosing casing on said base having a tapered air conducting neck in which said supply nozzle is mounted, said neck being adapted to extend into an opening in the furnace, said base being movable longitudinally towards and from the furnace opening whereby said tapered neck controls the supply of the surrounding air to the firepot.

4. A hydrocarbon burner comprising a longitudinally-slidable base member, a supply nozzle, a motor mounted on said base for driving said nozzle, a pump to force fuel to said nozzle, a by-pass for returning the unused fuel, a fuel-heating element, a blower for supplying air to the nozzle, a casing for inclosing said operating parts and also mounted on said base, flexible fuel pipes to permit movement of said base with its burner unit without disconnecting the supply and means for locking said base in adjusted position.

In testimony whereof I affix my signature.

LEO F. NOCK.