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H. C. LITTLE

LIQUID FUEL BURNER

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Fig. 1.

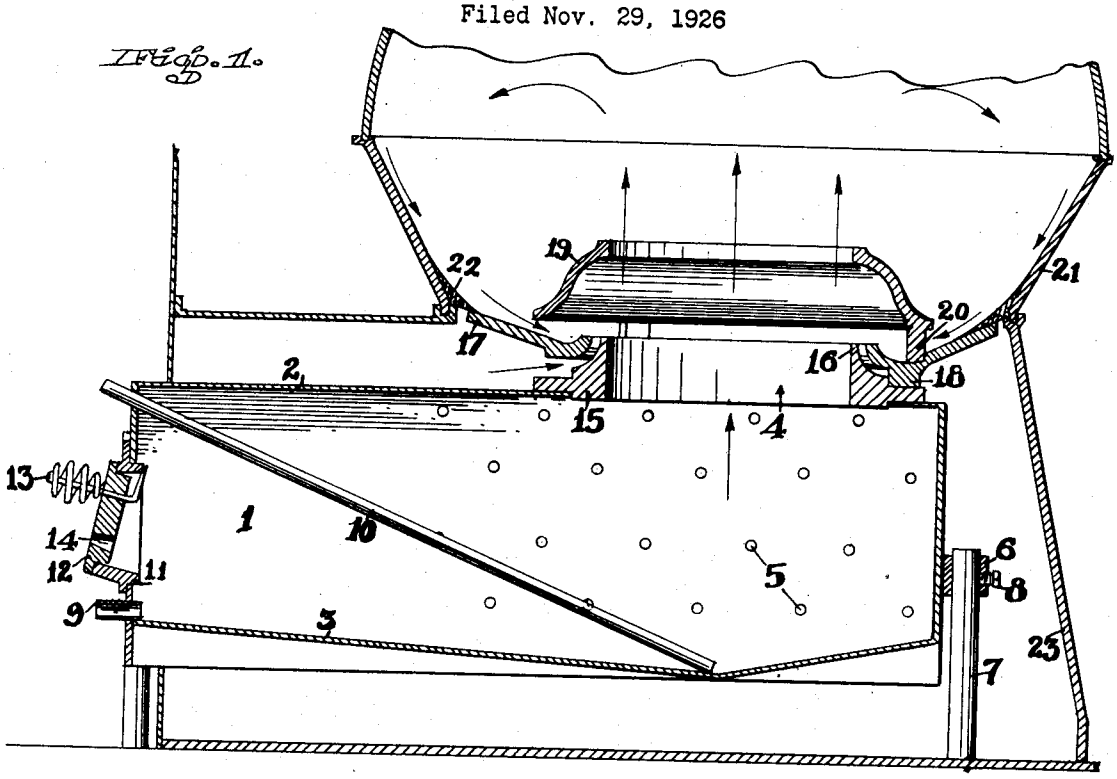
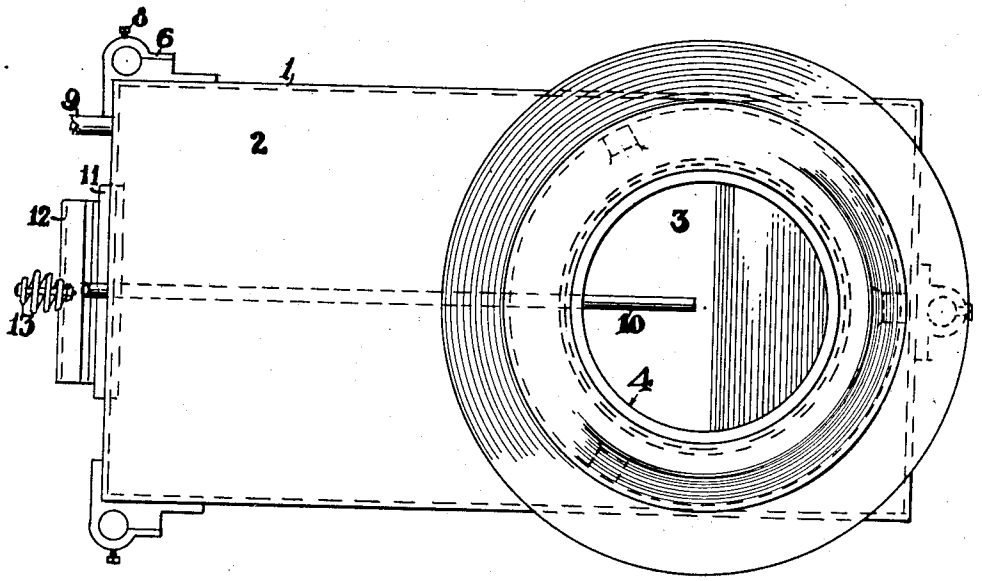


Fig. 2.



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LIQUID-FUEL BURNER.

Application filed November 29, 1926. Serial No. 151,571.

This invention relates to liquid fuel burners constructed and designed to readily vaporize the fuel, whereby more complete combustion and efficiency is obtained.

The primary object of this invention is to provide a liquid fuel burner of novel construction, whereby the vaporization and more complete combustion of the fuel is obtained without the use of additional means for aiding vaporization and combustion.

Another object of this invention is to provide a liquid fuel burner of novel construction and design adapted to produce more complete combustion of the cheaper grades of fuel oil.

Another object of this invention is to provide a liquid fuel burner adapted to readily vaporize and burn liquid fuel without the usual accumulation of carbon and soot.

A further object of this invention is to provide a liquid fuel burner in which the oil admitted thereto is readily vaporized and mixed with air to cause more complete combustion and efficiency.

Another object of this invention is to provide a liquid fuel burner having a construction adapted to cause the gases of combustion delivered into a furnace to circulate in such a manner as to distribute the heat evenly throughout the inside thereof.

Further advantages and objects more or less apparent will be pointed out hereinafter, reference being made to the accompanying drawing in which like numerals of reference indicate the same parts throughout the several views:

Fig. 1 is a vertical longitudinal sectional view of a liquid fuel burner embodying my invention; and

Fig. 2 is a top view thereof.

Referring to the drawing the numeral 1 represents a side wall, preferably of rectangular shape, having a top 2 and a bottom 3, the said top and bottom being either secured by welding or other suitable means to the side wall or formed integrally therewith.

The top 2 is provided with a large circular opening 4, which is located adjacent its rear end, and the side wall 1 is provided with a plurality of holes 5, distributed around its central and rear part, the said holes being adapted to allow a quantity of air to enter into the combustion chamber located between the wall, top and bottom.

The bottom 3 is declined from the front and rear ends of the rectangular shaped wall to a point approximately beneath the center of the large opening 4, thereby enabling a quantity of liquid fuel to flow toward and accumulate at a point on the bottom immediately beneath the large central opening.

Secured to the front corners and the rear end of the side wall 1 by welding or other suitable means are three projecting lugs 6, having vertically extending openings therein, through which three legs 7 adjustably extend, each of said legs being held in a suitable position by set screws or bolts 8.

Located in the front end of the wall 1 adjacent the bottom 3 is a suitable hole through which a feed pipe 9 extends, the same being adapted to admit a quantity of liquid fuel to the inside of the combustion chamber.

Located in the front end of the wall 1, adjacent the top 2, is a suitable hole through which a pipe 10 extends, the end thereof being located immediately above the lowest part of the bottom 3 at a point where the liquid fuel first accumulates. The pipe 10 is supplied with inflammable gas and serves as a pilot burner to ignite the liquid fuel admitted to the combustion chamber.

Centrally located in the front end of the wall 1 between the feed pipe 9 and the pipe 10 is a square shaped opening around the edges of which is located a frame 11. The frame 11 is secured to the front end of the wall by welding or other suitable means, and adapted to rest thereon is a door 12, which has extending therethrough a key 13, the end of which may be moved to engage with the inside part of the frame 11 to prevent the door from becoming dislodged from the frame. A hole 14, located in the door 12, permits a quantity of air to enter the combustion chamber.

Projecting inside the large circular opening 4 and resting on the top 2, is a circular ring 15, which is provided with an upwardly extending circumferential projecting part 16.

Located outside the ring 15, with its up-

wardly extending part separated from the part 16 so as to provide an air channel through which air may proceed in an upward direction, is an air guiding ring 17, having a plurality of downwardly extending lugs 18 which rest on the ring 16 and support the air-guiding ring in a proper position on the ring 15.

Located above the air-guiding ring 17 with its bottom edge spaced apart from the top edge of the air-guiding ring 17, is a top ring 19, having a plurality of downwardly projecting lugs 20 which rest on the top surface of the air-guiding ring 17 and support the top ring 19 in a proper position above the same.

The outside circumferential edge of the air-guiding ring 17 is located adjacent the walls of a furnace 21 and a quantity of plastic material 22 affords a means for sealing the space between the edge of the said ring and the furnace wall so as to prevent air from entering the bottom part of the furnace except through the burner.

The burner is located inside a fire box 23, immediately beneath the furnace, and is easily removed therefrom after breaking away the plastic material 22 located on the edge of the ring 17 and adjacent the furnace wall 21.

In operation, oil or other liquid fuel admitted to the combustion chamber through the feed pipe 9 drops on the bottom 3 and flows downwardly over the same until it reaches the pilot burner located at the end of the pipe 10, where it becomes ignited. Primary air for the the initial combustion of the oil is supplied to the combustion chamber mainly through the hole 14 located in the door 12, and as this air proceeds from a jet the velocity is high, and a strong circulation is set up within the combustion chamber from the said hole toward the circular opening 4. The oil vapors circulate along the sides of the combustion chamber toward the front of the burner and the air admitted through holes 5 mixes with the same as it moves past the said holes. The mixture of oil vapors and air upon reaching the front of the burner combines with the air entering through the hole 14, and is carried with considerable velocity through the combustion chamber to a point directly under the circular opening 4, where the temperature is high and the velocity low. At this point combustion occurs, and owing to the fact that the velocity of the mixed oil vapors and air is so great at the front of the burner, no combustion is permitted to take place except within the area located immediately beneath the circular opening 4. The heat generated through the combustion of the mixture of oil vapors and air at this point is intense, but excessive heat is prevented from reaching the walls of the combustion chamber because of the rich oil vapors circulating along the same toward the burner front.

As the gases of combustion pass upwardly and emerge through the large circular opening 4 they come into contact with the air admitted in a vertical direction through the channel provided between the upwardly projecting part 16 of the ring 15 and the air-guiding ring 17.

The entry of the air with considerable velocity at this point causes the inert gases which tend to stratify along the furnace walls, to move downwardly and pass through the space located between the upper part of the air-guiding ring 17 and the lower edge of the top ring 19, after which they combine with the gases of combustion passing upwardly through the large opening 4. The location and shape of top ring 19 causes the movement of the gases thus passing downwardly along the furnace walls to become accelerated, thereby aiding combustion and distributing the heat more evenly throughout the furnace.

It is evident to those skilled in the art that the liquid fuel burner herein shown and described may assume any desired shape, and may be constructed from any material suitable to withstand a high degree of heat, without departing from the spirit of the invention. In this connection I have found that a burner having other shaped parts may be embodied in my invention, and I therefore do not desire to be limited to the exact details of construction as herein shown and described but desire my invention to include any construction within the spirit of the appended claims.

Having described my invention, what I claim is:

1. A liquid fuel burner having a combustion chamber enclosed by side walls, a top and a bottom, a large opening located in the top through which the gases of combustion may pass from the combustion chamber, a ring resting on the top and located inside the edge of the large opening, and an air-guiding ring resting on the first mentioned ring and spaced therefrom, whereby a quantity of air may enter the burner and mix with the gases of combustion passing through the large opening in the top.

2. A liquid fuel burner having a combustion chamber enclosed by side walls, a top and a bottom, the top having a large opening through which the gases of combustion may pass from the combustion chamber, a ring resting on the top and located inside the edge of the large opening, an air-guiding ring resting on the first mentioned ring and spaced therefrom whereby a quantity of air may enter the burner and mix with the gases of combustion passing through the large opening in the top, and

a top ring resting on the air-guiding ring and spaced therefrom, whereby some of the gases of combustion which have passed through the large opening in the top may pass between the top ring and the air-guiding ring and mix with the gases of combustion passing through the large opening in the top.

3. A liquid fuel burner having a combustion chamber enclosed by side walls, a top and a bottom, the top having a large opening through which the gases of combustion may pass from the combustion chamber, a ring resting on the top and located inside the edge of the large opening, an air-guiding ring resting on the first mentioned ring and spaced therefrom, having its outside edge sealed against the walls of a furnace, a top ring resting on the air-guiding ring and spaced therefrom whereby an air channel is provided through which some of the combusted gases passing into the furnace from the combustion chamber may circulate from the inside of the furnace through the said air channel and mix with the gases of combustion passing into the furnace through the large opening in the top.

4. A liquid fuel burner having a combustion chamber enclosed by side walls, a top and a bottom, the top having a large opening through which the gases of combustion may pass from the combustion chamber, a ring resting on the top and located inside the edge of the large opening, an air-guiding ring resting on the first mentioned ring and spaced therefrom to provide an air channel for the entry of air from the outside of the burner, the outside edge of the air-guiding ring being sealed against the walls of a furnace, a top ring resting on the air-guiding ring and spaced therefrom whereby an air channel is provided through which some of the combusted gases passing into the furnace from the combustion chamber may circulate from the inside of the furnace through the said air channel and mix with the gases of combustion passing into the furnace through the large opening in the top.

5. A liquid fuel burner having a combustion chamber enclosed by side walls, a top and a bottom, the top having a large opening through which the gases of combustion may pass from the combustion chamber, a ring located on the top around the large opening having an upwardly projecting part thereon, an air-guiding ring located above the first mentioned ring with its inside edge spaced apart from the upwardly projecting part of the said first mentioned ring, whereby an air channel is formed for the entry of air to the inside of the burner in a vertical direction, and a top ring located above the air-guiding ring and spaced therefrom whereby a second air channel is provided for the entry into the burner of some of the gases of combustion which have emerged through the large opening in the top.

6. A liquid fuel burner having a combustion chamber enclosed by side walls, a top and a bottom, the top having a large opening through which the gases of combustion may pass from the combustion chamber, a ring located on the top around the large opening having an upwardly projecting part extending around the same, an air-guiding ring located above the first mentioned ring with its outside edge sealed against the walls of a furnace and its inside edge spaced apart from the upwardly projecting part of the first mentioned ring, whereby a quantity of air from the outside of the burner may enter the burner in a vertical direction and mix with the combusted gases emerging through the large opening in the top, and a top ring located above the air-guiding ring with its bottom edge spaced herefrom, whereby some of the combusted gases which have passed into the furnace through the large opening in the top may mix with the gases of combustion proceeding from the combustion chamber to the inside of the furnace.

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