Jan. 1, 1929. 1,697,279

H. G. KLEMM

ROTARY ATOMIZING BURNER

Filed Sept. 9, 1926 2 Sheets-Sheet 1

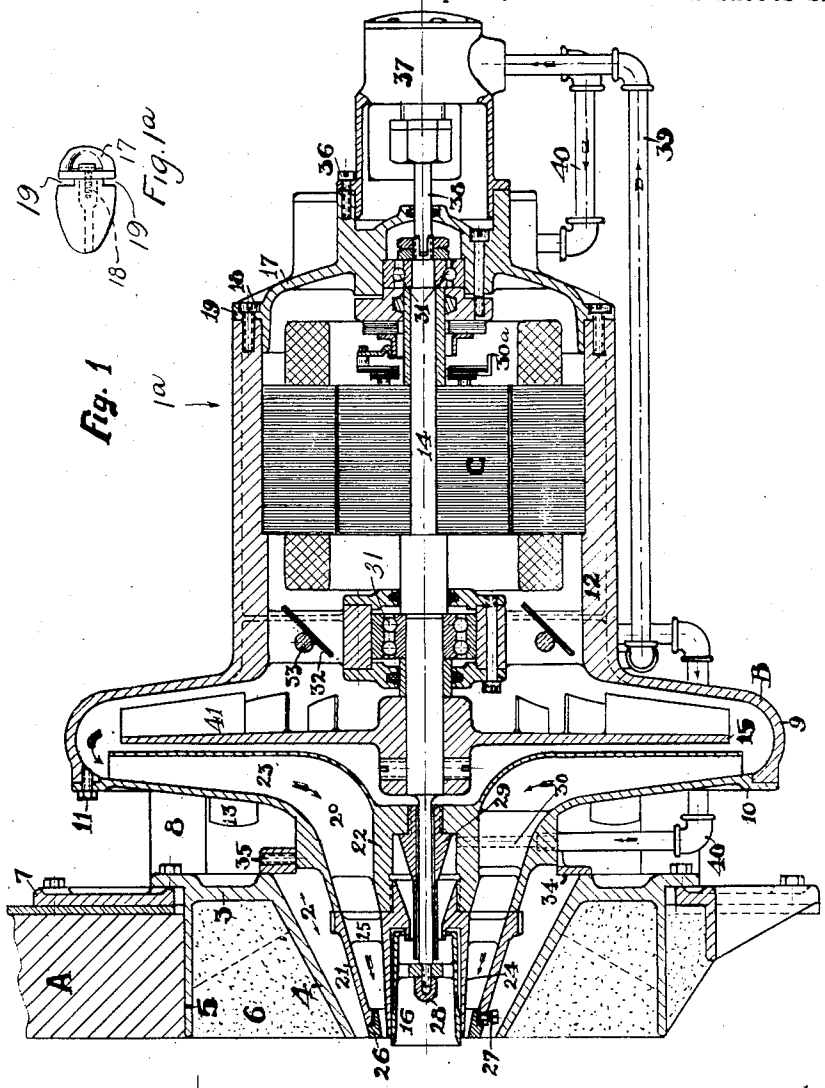


Fig. 1

Fig. 1a

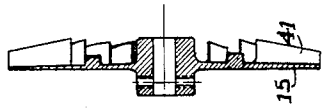


Fig 3

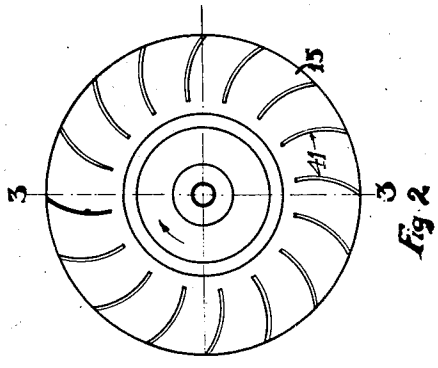


Fig 2

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Fig. 4

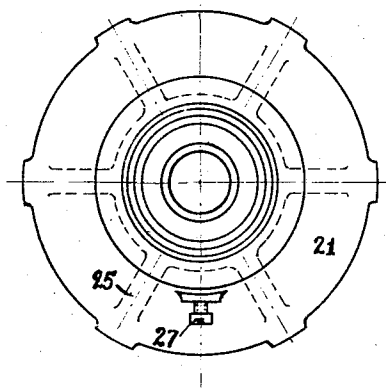


Fig. 5

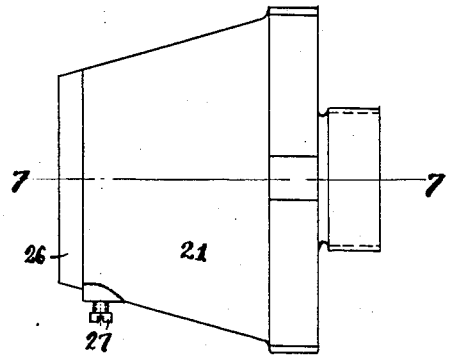


Fig. 6

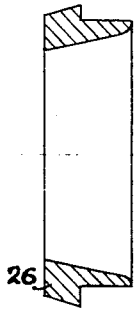
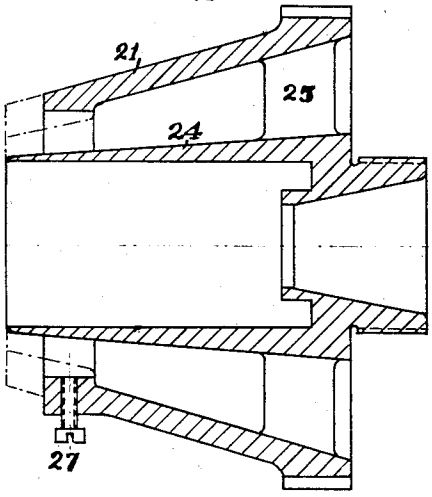


Fig. 7



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UNITED STATES PATENT OFFICE.

HERMAN G. KLEMM, OF SAN FRANCISCO, CALIFORNIA.

ROTARY ATOMIZING BURNER.

Application filed September 9, 1926. Serial No. 134,524.

This invention relates to improvements in rotary atomizing burners.

An object of the invention is to provide a rotary atomizing burner in which is located a centrifugal atomizer of novel design and an improved means for supplying fuel thereto.

Another object of this invention is to provide a rotary atomizing burner having an atomizer to which may be attached different styles of nozzles, whereby a flame may be made to assume shapes adapted for different kinds of fire boxes.

A further object of the invention is to provide a rotary atomizing burner having novel means for the inductance of oil or other fuel to a centrifugal atomizer.

A further object of the invention is to provide a rotary atomizing burner having novel means for inducing a satisfactory current of air therethrough.

A further object of the present invention is to provide a rotary atomizing burner possessing marked advantages in point of accessibility, durability, efficiency and economy.

In the accompanying drawings forming a part of this application,

Fig. 1 is a vertical sectional view of a rotary atomizing burner embodying my invention;

Fig. 1ª is a plan view of a portion of the burner taken in the direction indicated by the arrow in Fig. 1;

Fig. 2 is a front view of the fan comprising a part of my invention;

Fig. 3 is a sectional view of the fan taken on the line 3—3 of Fig. 2;

Fig. 4 is an end view of the burner nozzle;

Fig. 5 is a side view of the burner nozzle;

Fig. 6 is a sectional view of the detachable tip of the nozzle; and

Fig. 7 is a sectional view of the burner nozzle taken on the line 7—7 of Fig. 5.

Referring to the drawings, A represents the front end of a fire box of an ordinary furnace and 2 the opening in the same, ordinarily closed by the burner when the same is in normal operating position. Suitably secured to a front plate 7 by screws, bolts or other means, is a removable plate 3 having a conical extension 4 and a straight extension 5, and located between the said extensions is a refractory or fire proof material 6 comprised preferably of powdered brick, plastic clay and asbestos. The conical extension 4, which projects into the opening 2, forms a metallic lining for the said opening, and the entire structure comprised of the plate 3, its extensions, and the fire proof material 6, may be conveniently removed from the front of the fire box or adjusted thereon.

Suitably secured to the front end of the fire box A, and located inside of plate 3, is a front plate 7, having a pair of hinge lugs 8 thereon which serve to support the burner casing B.

The casing B consists of a housing 9 which is adapted to enclose both the fan and motor, and a cover plate 10, the latter being secured to the former by screws 11. Projecting from the inside surface of the housing 9 and extending longitudinally thereon are a plurality of ribs or flanges 12, which form air passages for the air proceeding through the burner, as will later be described.

Formed integrally with the housing 9 are a pair of hinge lugs 13 which co-operate with the lugs 8 to form a hinge about which the casing B may swing.

Suitably mounted within the casing B is an electric motor C, provided with a shaft 14, one end of which is sufficiently extended to form a support for a fan 15, and an atomizing cup 16, both of which are suitably secured thereto.

The front end of the casing B has a cover plate 17 attached to it by screws 18, and slots 19 are provided near its said front end through which air may be supplied for combustion purposes.

A discharge chamber 20 for the air drawn in through the slots 19 and expelled by the fan 15 is provided in the cover plate 10, and the said chamber is extended by suitably securing to the said cover plate a tapered nozzle 21 which is screwed into a horizontally extending part 22 of a partition plate 23 which is located inside the said plate and forms a part thereof.

The tapered nozzle 21 is comprised of a straight part 24 which is screwed into the horizontally extending part 22 of the partition plate 23, a tapered outside part designated as 21, and a plurality of radial members 25 which are integral therewith and extend from the straight part 24 to the inside of the tapered part 21. To the end of the tapered nozzle 21 is removably at-

tached a tip 26 which may be of any suitable shape to regulate the size and shape of the flame, and which is held thereon by a screw 27.

The straight part 24 of the tapered nozzle 21 is located around the atomizing cup 16, and is designed to direct the air discharged from the end of the said nozzle in a straight direction, and to prevent its assuming a tangential direction, which would be the case if the nozzle were not constructed and located as shown.

Screwed on the end of the shaft 14 and located inside the straight part 24 of the nozzle 21, is the atomizing cup 16, which is held firmly on the said shaft by a nut 28 that is screwed on the end of the said shaft.

The horizontally extending part 22 of the partition plate 23 is separated from but extends horizontally around the shaft 14, and located between it and the said shaft is a tapered bushing 29, which is screwed into the horizontally extending part 22 of the partition plate 23, and serves to prevent oil from passing into the space inside the casing B where the fan 15 is located, as will be described herein. The horizontally extending part 22 therefore divides the outer annular chamber 20 from the inner annular chamber surrounding the bearing bushing, the inner chamber providing a channel through which oil may pass to the atomizing cup 16.

The oil is admitted into this channel through an opening 30 extending through the cover plate 10 and the horizontally extending part 22 of the partition plate 23, and the said oil proceeds through the channel located between the inside of the tapered nozzle 21 and the bushing 29, to the atomizing cup 16 from which it is discharge by the centrifugal action thereof.

The motor C is located inside the casing B and is provided with a switch 30ª which permits electricity to flow thereto for the operation of the burner.

The shaft 14 carries the atmozing cup 16 and the fan 15, and rests upon the ball bearings 31 which are suitably supported inside the casing B.

Located inside the casing B between the motor C and the fan 15 and in the path of the air proceeding through the slots 19 to the fan, are two butterfly valves 32 which are secured to rods 33 extending through the casing, the said butterfly valves being a means to regulate the amount of air drawn through the said casing by the fan, and the said rods being a convenient means for manipulating the said valves.

The burner as a unit may be swung into an operative position by moving it on its hinges, and the opening 2 is suitable in size and shape to accommodate the nozzle 21 when the burner is in an operative position.

Extending around the cover plate 10 is a ring 34, which is adjustably secured to the said cover plate by a screw 35. The ring 34 is a means for regulating the amount of secondary air passing through the opening 2 from the outside of the furnace to the inside thereof.

Attached to the cover plate 17 by screws 36 is an oil pump 37 having a shaft 38 which is suitably secured to the shaft 14 in such a manner that the two shafts revolve as a unit, thereby transferring the necessary power from the motor C to operate the pump.

A pipe 39, connected to a suitable container of oil, supplies fuel for the burner, and the said pump draws the same in through the said pipe 39 and ejects it through pipe 40, which is suitably connected to the opening 30.

The fan 15 is provided with a plurality of vanes 41 which are curved and extend from the circumferential edge thereof to points located inside its said edge.

This application is a continuation in part of my application for Letters Patent filed May 4, 1926, Serial Number 106,615, and entiled "Burner mountings." As to all subject matter, except the specific mounting of the fuel pump, this application is a division of the latter application.

Although I have illustrated on the drawings but one form my invention may assume, it is to be understood that the same may be embodied in other constructions included within the spirit of the appended claims.

Having described my invention, what I claim is:

1. In a liquid fuel burner, a casing having at one end a bearing surrounded by concentric annular chambers, an air nozzle on said casing having an annular passage alined with the outer annular chamber of the casing and a central chamber alined with the inner annular chamber of the casing and into which said bearing extends, a shaft journaled in said bearing and extending into the central chamber of the nozzle, an atomizing cup on said shaft in said central chamber and opening at one end into said inner annular chamber, means for introducing liquid fuel into said inner annular chamber, and means for introducing air under pressure into the outer annular chamber.

2. In a liquid fuel burner, a casing having at one end a bearing surrounded by concentric annular chambers, an air nozzle on said casing having an annular passage alined with the outer annular chamber of the casing and a central chamber alined with the inner annular chamber of the casing and into which said bearing extends, a shaft journaled in said bearing and extending into the central chamber of the nozzle, an atomizing cup on said shaft in said central chamber

and opening at one end into said inner annular chamber, means for introducing liquid fuel into said inner annular chamber, a fan on said shaft and within said casing for introducing air under pressure into the outer annular chamber, and a motor within said casing for driving said shaft.

3. In a liquid fuel burner, a casing having at one end a bearing surrounded by concentric annular chambers, an air nozzle on said casing having an annular passage alined with the outer annular chamber of the casing and a central chamber alined with the inner annular chamber of the casing, a shaft journaled in said bearing and extending into the central chamber of the nozzle, an atomizing cup on said shaft in said central chamber and opening at one end into said inner annular chamber, means for introducing liquid fuel into said inner annular chamber, and means for introducing air into the outer annular chamber.

HERMAN G. KLEMM.