Oct. 29, 1929. H. G. KLEMM 1,733,499

BURNER MOUNTING

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Fig. 1

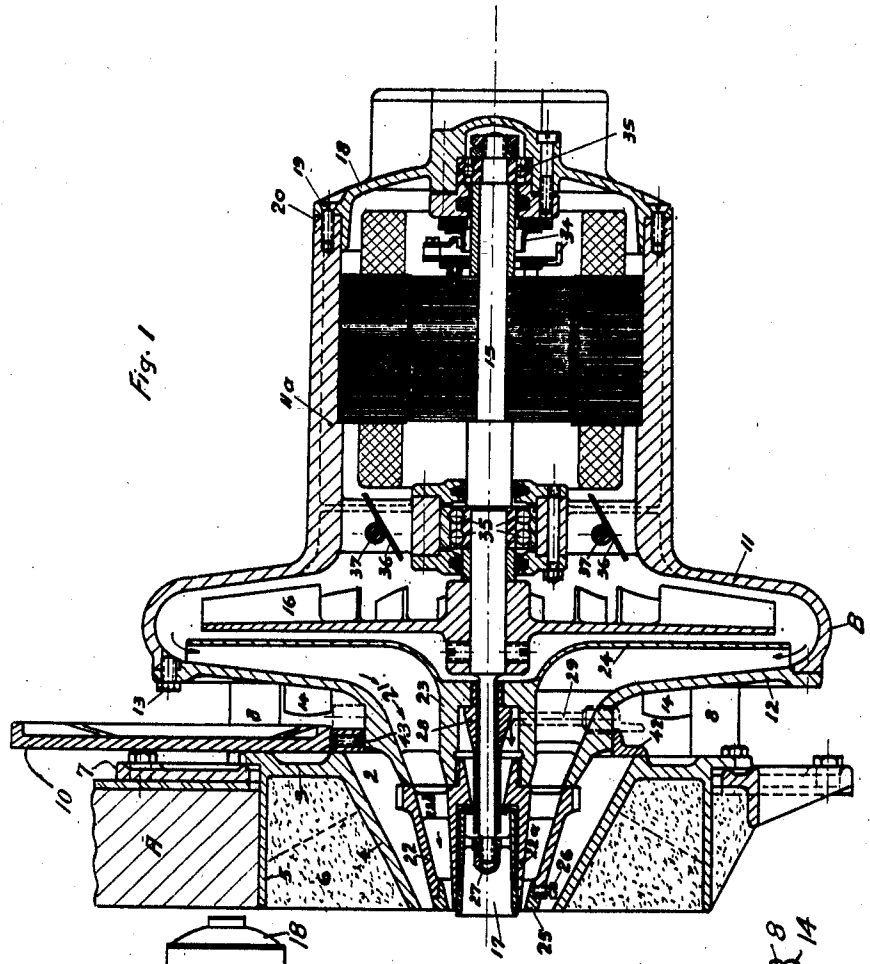


Fig. 2.

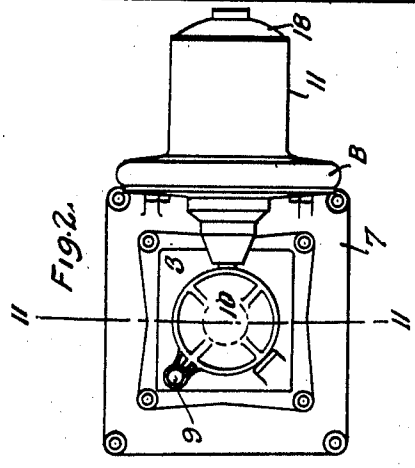
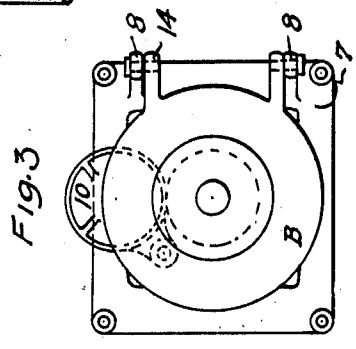


Fig. 3



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BURNER MOUNTING

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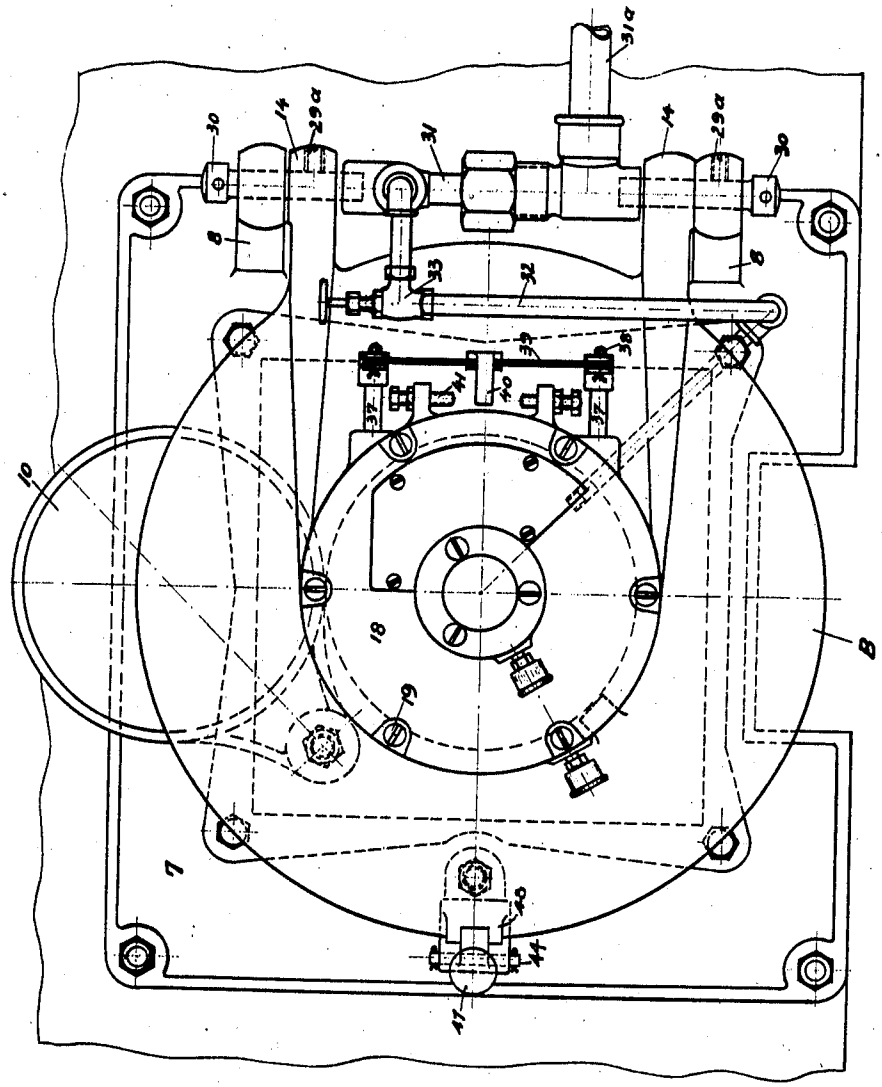


Fig. 4.

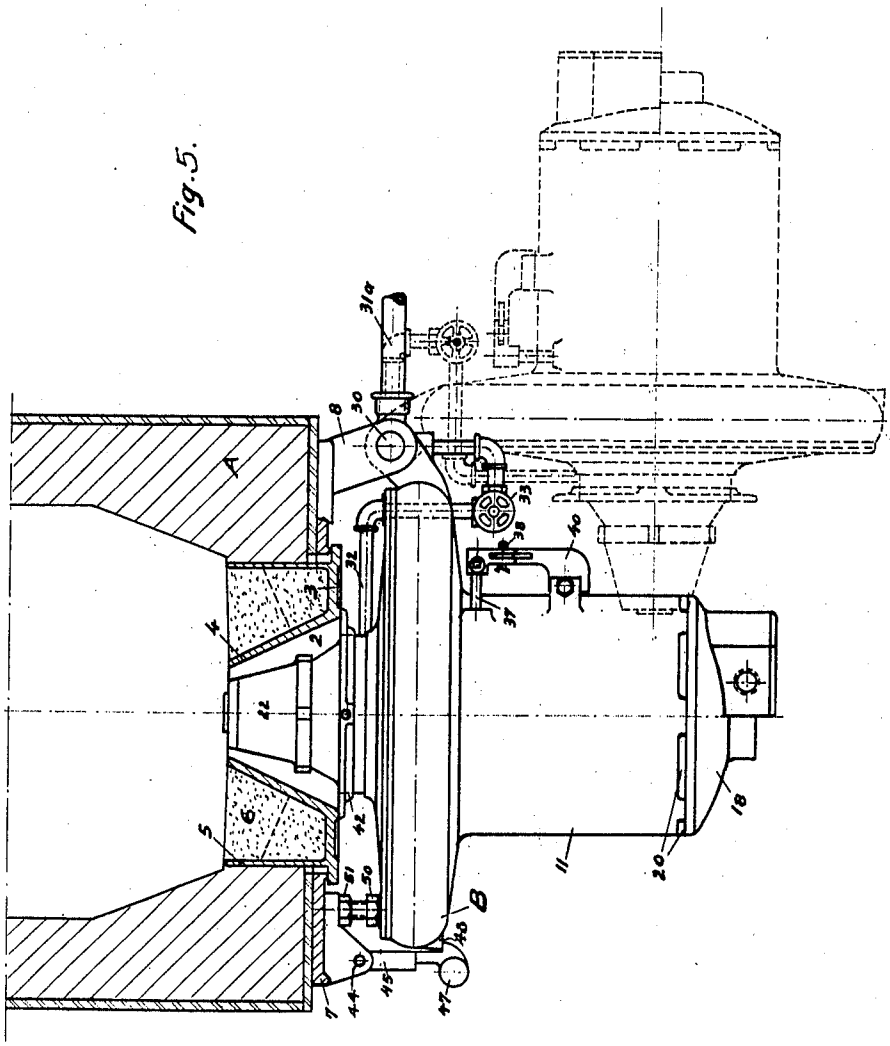
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Fig. 5.



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BURNER MOUNTING

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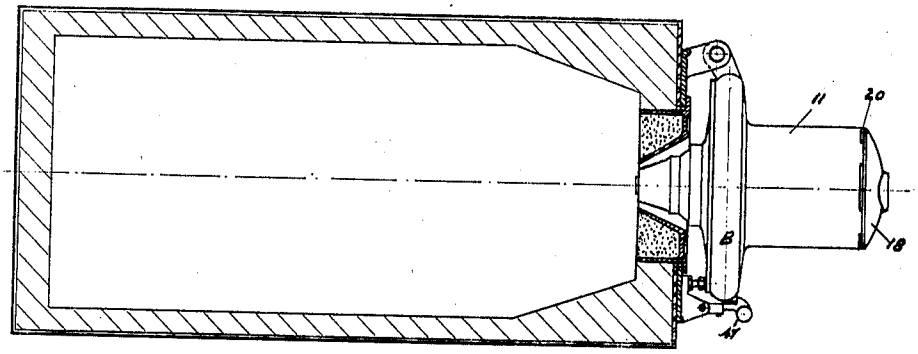


Fig. 6

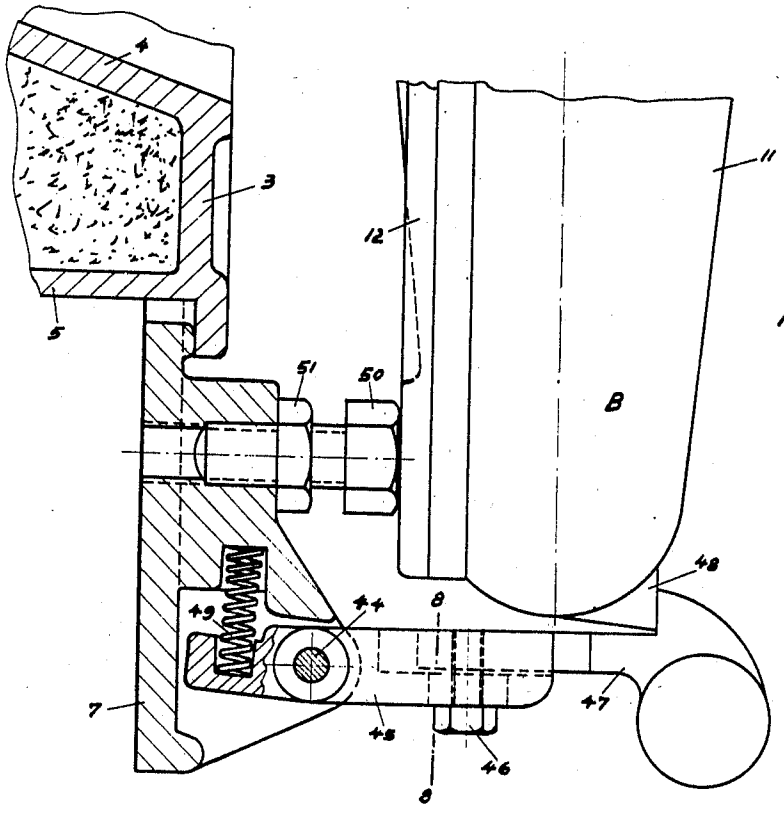


Fig. 7

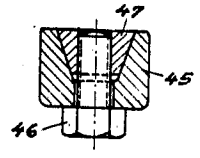


Fig. 8.

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UNITED STATES PATENT OFFICE

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BURNER MOUNTING

Application filed May 4, 1926. Serial No. 106,615.

This invention relates to mountings for centrifugal atomizing type oil burners.

An object of this invention is to provide a liquid fuel burner having adjustable means for regulating its position so that the flame therefrom may be properly aligned with relationship to the center of a fire box.

Another object of this invention is to provide an atomizing oil burner and door having satisfactory means associated therewith for regulating the amount of secondary air admitted into a firebox for combustion purposes.

Another object of this invention is to provide a liquid fuel burner adapted for use with a fire box having a removable door for closing a central opening in its front wall through which the front of the burner projects.

In the accompanying drawing forming a part of this application:

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

Fig. 2 is a front view of a fire box showing the burner in inoperative position and a pivoted door closing the fire box opening.

Fig. 3 is a view similar to Fig. 2 showing the pivoted door away from the opening and the burner in operative position.

Fig. 4 is a front view of the structure shown in Fig. 1.

Fig. 5 is a top view of the structure shown in Fig. 1.

Fig. 6 is a top view of the burner applied to a fire box shown in cross section, illustrating in a general way the means used to adjust the nozzle of the burner.

Fig. 7 is a sectional detail view illustrating specifically the burner nozzle adjusting means.

Fig. 8 is a sectional view taken on line 8—8 of Fig. 7.

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. Demountably secured to a front plate 7 by screws is an annular plate 3 having a conical flange 4 and a straight flange 5 on the inner and outer peripheries thereof so as to form an inwardly opening annular trough. Located between the said flanges and filling the trough is a fire proof material 6 comprised of powdered brick, plastic clay and asbestos. The conical flange 4 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, constitutes a closure for the doorway or aperture of the fire box around the burner nozzle, and may be easily removed from the front of the fire box or adjusted thereon.

Suitably secured to the front end of the fire box A, and located on the inside of plate 3, is the front plate 7, having a pair of hinge lugs 8 thereon which serve to support the casing B. Pivotally attached to the plate 3 by a bolt 9, is a door 10 which serves to close the opening 2 when the burner is not in operative position. The casing B consists of a housing 11, adapted to enclose both the fan and the motor, and a cover plate 12, secured to the housing by screws 13. Projecting from the inside surface of the housing 11 and extending longitudinally thereon are a plurality of ribs 11^a, which form air passages for the air admitted to the burner, as will be later described.

Formed integrally with the housing 11, are a pair of hinge lugs 14 which cooperate 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 15, extended to form a support for a fan 16, and an atomizing cup 17.

The front end of the casing B has a cover plate 18 attached to it by screws 19, and slots 20 are provided near its said front end through which air may be supplied for combustion purposes. A discharge chamber 21 for the air drawn in through the slots 20 and expelled by the fan is provided in the cover plate 12, and the said chamber is extended by securing to the said cover plate a tapered nozzle 22 which is screwed into a horizontally extending part 23 of a partition plate 24 which is located inside the said plate and forms a part thereof.

The tapered nozzle 22 is comprised of a straight part 22ª which is screwed into the horizontally extending part 23 of the partition plate 24, a tapered outside part 22, and a plurality of radial members 22ᵇ which are integral therewith and extend from the straight part 22ª to the inside of the tapered part. To the end of the tapered nozzle 22 is removably attached a tip 25 of any suitable shape to regulate the size and shape of the flame, and which is held thereon by a screw 26.

The straight part 22ª of the tapered nozzle 22 is located around the atomizing cup 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 it were not constructed and located as shown.

Screwed on the end of the shaft 15 and located inside the straight part 22ª of the tapered nozzle 22, is the atomizing cup 17, held firmly on the shaft by a nut 27, screwed on the end of the said shaft.

The horizontally extending part 23 of the partition plate 24 is separated from but extends horizontally around the shaft 15 and between it and the said shaft is a tapered brass bushing 28, which is threaded into the horizontally extending part 23 of the partition plate 24, and serves to prevent the oil from passing into the space inside the casing B where the fan 16 is located, as will be hereinafter described. The horizontally extending part 23 is sufficiently separated from the brass bushing 28 to provide a channel through which oil may pass to the atomizing cup 17. The oil is admitted into this channel through an opening 29 extending through cover plate 12 and the horizontally extending part 23 of partition plate 24, and passes through the channel located between the inside of the tapered nozzle 22 and the bushing 28, to the atomizing cup 17 from which it is discharged by centrifugal action.

Extending through the hinge lugs 8 and 14, and secured therein by screws 29ª, are bolts 30, and over the inwardly projecting ends of the bolts and between the same is a hollow pintle member 31, through which oil may pass under pressure from a source of supply through a pipe 31ª. Connected to the pintle member 31 is a pipe 32 suitably connected to the opening 29 located in the cover plate 12; and a valve 33 is provided for regulating oil passing through the pipe 32 to the inside of the burner.

The motor C is located inside the casing B and is provided with a switch 34 which permits electricity to flow thereto for the operation of the burner.

The shaft 15 carries the atomizing cup 17 and the fan 16, and rests upon the ball bearings 35 which are suitably supported inside the casing B.

Located inside the casing B between the motor C and the fan 16 and in the path of the air proceeding through the slots 20 to the fan, are two butterfly valves 36 which are secured to rods 37. These valves are for regulating the air drawn through the casing by the fan.

The rods 37 are attached by pins 38 to a bar 39 which is moved upwardly or downwardly to open or close the butterfly valves by a handle 40.

Stops 41 screwed into suitable projections on the casing B limit the movement of the handle.

The burner as a unit may be swung into an operative position by moving it on its hinges, and the opening 2 in the front of the furnace may be closed when the burner is in an inoperative position and to retain the heat in the combustion chamber, by dropping the door 10 over the said opening. It will be observed, from Figs. 2 and 3, that the door is so positioned as to rest upon the casing when the burner is within the furnace opening, and to fall, closing the opening when the burner is swung away from the furnace.

Extending around the cover plate 12 is a ring 42, which is adjustably secured to the said cover plate by a screw 43. The ring 42 serves as a means for regulating the secondary air passing through the opening 2 to the inside of the furnace.

Pivotally attached to the plate 7 by a pin 44 is a slotted bar 45 to which is attached, by a bolt 46, a latch member 47 which may be lengthened or shortened by loosening the bolt 46 and moving the said member outwardly or inwardly and then tightening the said bolt. The end of the latch member 47 is engageable with a boss 48 located on the casing B, and a spiral spring 49, the ends of which contact with the bar 45 and the plate 7, tends to keep the said end of the latch member in an engaged position on the said boss, thereby holding the burner in an operative position with the nozzle thereof inside the opening 2.

Threaded into the plate 7 at a point thereon adjacent the bar 45, is a cap screw 50 which is provided with a lock nut 51. The screw constitutes an adjustable stop for the burner casing.

It frequently happens that the front of the furnace becomes warped or distorted through the intense heat generated therein, and in such cases the burner does not exactly fit on the outside of the opening, thereby allowing unevenly distributed secondary air to be admitted to the combustion chamber. By turning the screw 50 into or out of the plate 7 so that the casing B strikes its head when the nozzle of the burner is in a suitable position, accurate alignment of the flame from the burner may be made with reference to the center of the fire box. The latch member 47 can be adjusted, to properly engage with the

boss 48 so that the casing B may be held against the stop 50, in a proper operative position.

In operation it is necessary to close the electric switch 34 to start the motor, to drive the fan 16 and the atomizing cup 17 with sufficient speed to cause the desired volume of air to be drawn in through slots 20 and discharged through the end of the tapered nozzle 22. Oil delivered to the cup through supply pipe 31^a, pintle 31, pipe 32 and opening 29 in the cover plate 12 and the extension part 23 of partition plate 24, will simultaneously be projected in the form of a thin spray by means of the centrifugal action. As the spray meets the outwardly discharging annular column of air from the tapered nozzle 22, a further atomizing effect will take place, causing a combined mixture of oil vapor and air to discharge in a forward direction into the furnace where it is ignited by any suitable means.

The delivery of the oil to the atomizing cup is accomplished by means of a pressure pump attached to the supply pipe 31^a or other suitable means. The volume of air delivered to the nozzle 22 by the action of the fan is regulated by the butterfly valves 36 which are conveniently regulated by the manipulation of the handle 40 which in turn actuates the rods 37 to open or close the valves. The stops 41 may be screwed backward or forward to hold the handle 40 in any desired position, thereby causing the butterfly valves to remain in a position adapted to permit the desired amount of air to pass around them to the fan.

I have described in detail the construction and operation of the atomizing oil burner in order that the many advantages of the furnace door and mounting might be more forcibly described. It is to be understood that I do not desire my invention to be limited to the exact form and construction illustrated and described, since the same may be embodied in other forms lying within the spirit of the appended claims.

Having described my invention, what I claim is:

1. A burner mounting comprising a plate secured to the front of a furnace having a central opening therein, a burner casing pivotally attached to the plate, an adjustable latch movably attached to the plate and engageable with the casing, and a stop movably attached to the plate and engageable with the casing, whereby the nozzle of the burner may be adjustably positioned to direct a liquid fuel in the proper direction inside the furnace.

2. A burner mounting comprising a plate secured to the front of a furnace and having an opening therein, a burner casing carrying a burner nozzle hinged on the plate with the burner nozzle adapted to project inside the said opening, a ring adjustable on the casing for regulating the secondary air passing through the said opening to the inside of the furnace, and means attached to the plate and engageable with the casing for adjustably positioning the nozzle of the burner to direct a liquid fuel in the proper direction inside the furnace.

3. A burner mounting for use at the doorway of a furnace, comprising an apertured plate adapted to be secured to the furnace wall about the doorway, a burner casing pivotally mounted on the plate, an adjustable stop disposed between the plate and the casing, and an adjustable latch for holding the casing against the stop in any of its adjusted positions.

4. The combination with a furnace having an opening therein and a movable burner projecting through the opening, of a pivotally mounted door resting on the burner and adapted to fall and close the opening upon movement of the burner away from the opening.

5. The combination with a furnace having an opening therein and a movable burner projecting through the opening, of a movably mounted door resting on the burner when the burner is in operative position and adapted to fall and close the opening upon movement of the burner away from the opening.

6. A burner mounting for use at the doorway of a furnace comprising means for movably mounting a burner casing, an adjustable stop disposed between the furnace and the casing, and means for holding the casing against the stop in any of its adjusted positions.

7. A burner mounting for use at the doorway of a furnace comprising an apertured front plate adapted to be secured to the furnace wall about the doorway, a burner casing movably mounted on the plate, an adjustable stop disposed between the plate and the casing, and means for holding the casing against the stop in any of its adjusted positions.

8. A burner mounting for use at the opening of a furnace comprising means for movably mounting a burner adapted to project through the opening, a ring adjustable on the burner for regulating the secondary air passing through the opening to the inside of the furnace, and means engageable with the burner for adjustably positioning the nozzle of the burner to direct a liquid fuel in the proper direction inside the furnace.

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