Nov. 28, 1933. V. J. PAULOO 1,936,950

CONVERSION BURNER

Filed March 22, 1930 3 Sheets-Sheet 1

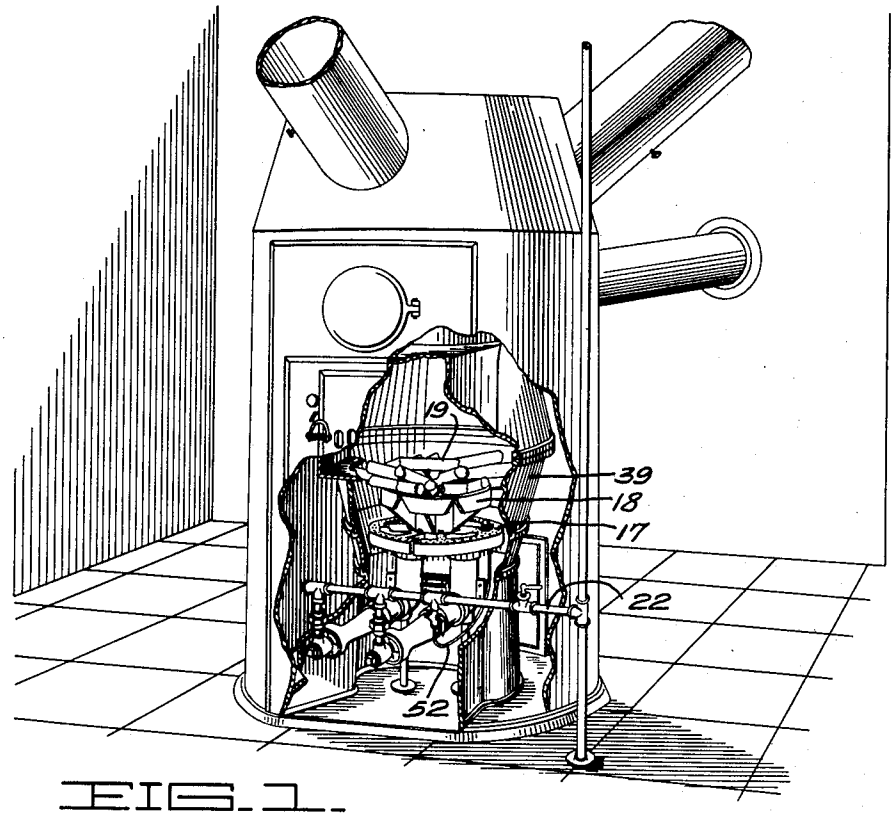


FIG. 1.

FIG. 2.

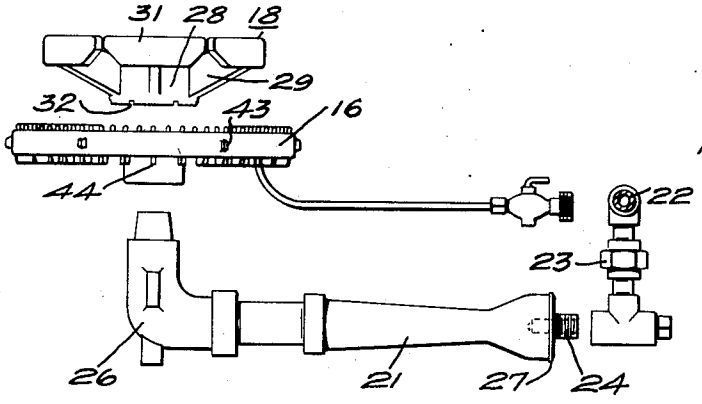
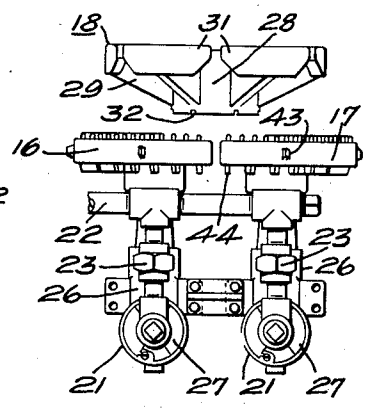


FIG. 3.



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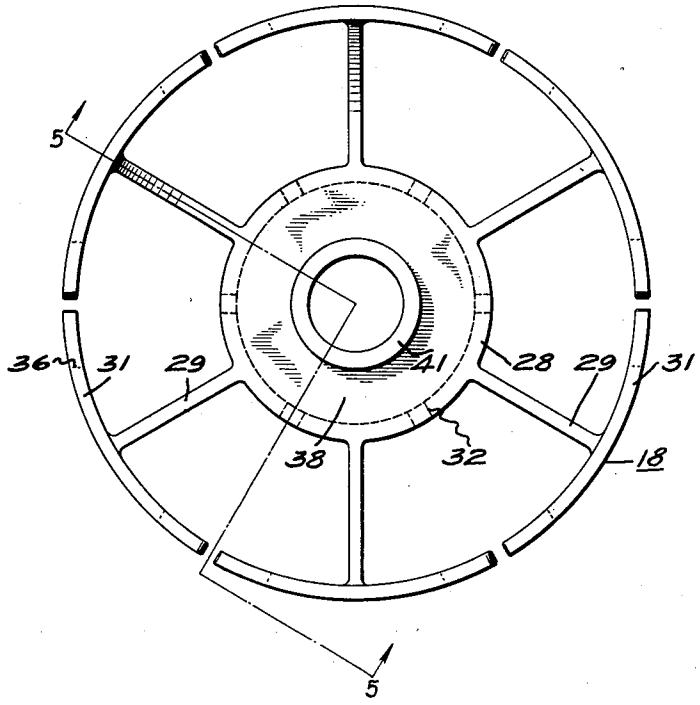


FIG. 4.

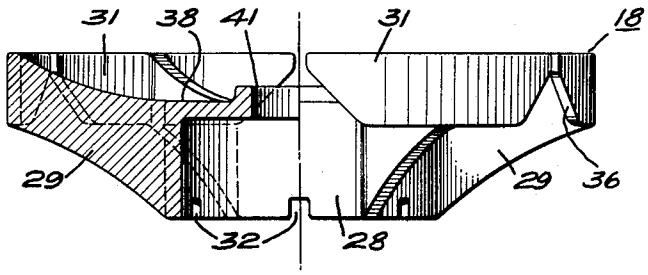


FIG. 5.

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CONVERSION BURNER

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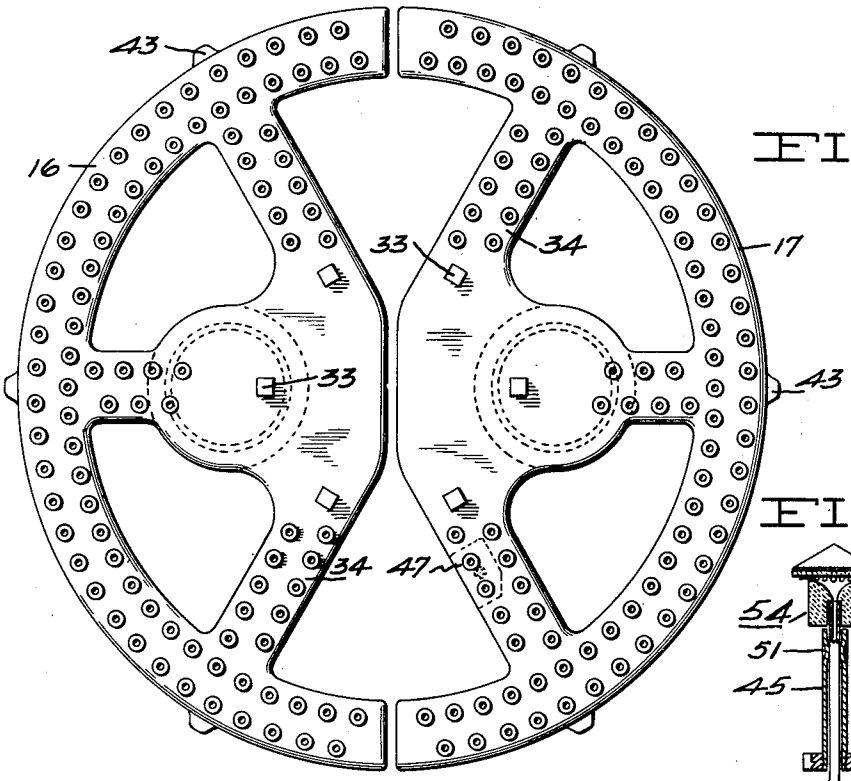


FIG. 6.

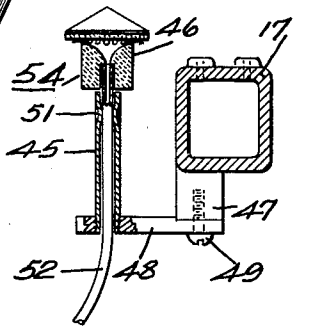


FIG. 8.

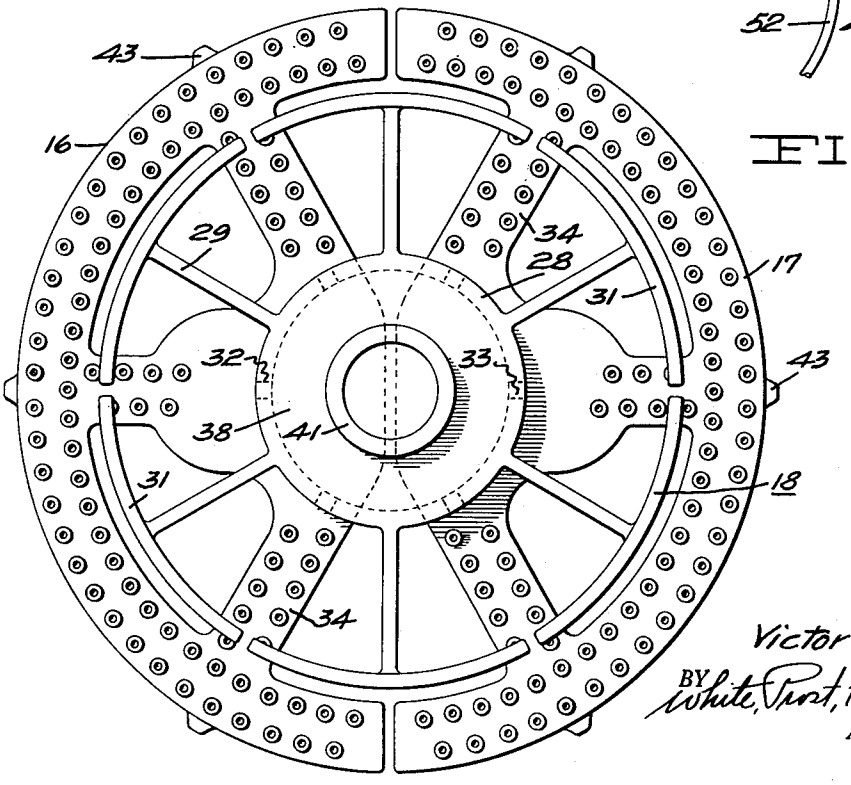


FIG. 7.

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UNITED STATES PATENT OFFICE

1,936,950

CONVERSION BURNER

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Application March 22, 1930. Serial No. 438,107

6 Claims. (Cl. 158—7)

My invention relates to gas burners suitable for heating dwellings and the like.

It is an object of the invention to devise a gas burner which is economical in operation and which will operate at high efficiency.

Another object is to devise a gas burner which can be installed in a furnace primarily designed for other kinds of fuel.

A further object is to devise a burner which is easy to install and which will require no servicing over a long period of time.

A still further object is to devise novel means in a gas burner for effectively radiating heat.

These and other objects will become apparent as the detailed description of my invention proceeds.

Attention is directed to the accompanying drawings in which:

Fig. 1 is a perspective view of my novel burner installed in a furnace.

Fig. 2 is an exploded side elevation showing the relative positions of the several parts of the burner.

Fig. 3 is an end view of the parts shown in Fig. 2.

Fig. 4 is a plan view of my novel refractory basket for supporting heat radiating elements.

Fig. 5 is an elevation of the basket shown partly in section along lines 5—5 of Fig. 4.

Fig. 6 is a plan view of a split burner head.

Fig. 7 is a plan view showing the burner head and the refractory basket in operating relation.

Fig. 8 is a detail view of a pilot mounting.

Briefly, the invention relates to gas heaters in which a plurality of refractory radiants are utilized to radiate heat. A support preferably having a basket-like form is employed for supporting the radiants in an efficient position above the burner. It is desirable to support the radiants in such a position that they will present relatively large radiating surfaces for radiating heat to the walls of a heating chamber. The supporting basket is designed with this purpose in view.

Referring to the drawings a burner head divided into two parts 16 and 17 is shown, upon which is supported a refractory basket 18 for holding a plurality of refractory radiants 19. In Fig. 1 I have shown my gas heater installed in a hot air furnace from which the grate has been removed and in a similar manner the heater can be installed in other types of furnaces and heaters merely by removing the interfering or obstructing parts. In the modification illustrated, I have shown the burner head in two parts 16 and 17 to facilitate insertion through a door or other opening in the furnace. Where an opening in the furnace is large enough to permit the insertion of an integral burner of sufficient area, the burner need not, of course, be made in separable parts. When the burner is made in separable parts, however, each part is preferably supplied with a combustible mixture of gas and air by a separate Venturi mixer 21. Gas is fed to the burner head through an intake pipe 22, through a pipe connection 23, through a suitable orifice 24, into the Venturi mixer 21 and through elbow 26 to the burner head. A suitable shutter 27 can be employed to regulate the amount of air entering Venturi mixer 21.

The basket 18 for holding the refractory radiants is preferably made of cast iron and comprises a central hub 28 from which extend a plurality of radially disposed arms 29, each of which supports a segment 31. The radial arms 29 are relatively flat and lie in substantially vertical planes passing through the center of the basket. Thus, only a relatively narrow edge of each arm faces the burner flame. This construction precludes the absorption of any substantial amount of heat by radial arms 29 and does not deflect the flame from the refractory radiants 19 which are adapted to be piled in basket 18. For positioning basket 18 so that even the edges of radial arms 29 do not interfere with the flame from the burner, a plurality of slots 32 are provided in hub member 28 to register with corresponding lugs 33 on the burner head. The lugs 33 preferably position basket 18 so that radial arms 29 are placed intermediate the radial portions 34 of the burner head.

The curved segments 31 at the end of radial arms 29 preferably are curved to conform to part of a cylindrical surface and, like radial arms 29, these segments are vertically disposed and present only a relatively narrow edge toward the burner flame. As shown in Fig. 7, segments 31 are preferably positioned to one side of the flame emanating from the ring portion of the burner head. Thus, only relatively small portions of segments 31 are positioned directly over the flame and the lower corners of the segments 31 are cut away, as at 36, to still further minimize the interfering portions. A suitable space is provided between adjacent segments so that the basket 18 can expand and contract without danger of cracking. It will be noted that each radial arm 29 is supported only at one end to hub 28, thus allowing each of these members to expand and contract independently.

Preferably, a suitable horizontal ledge or shelf

38 is formed on the upper portion of hub 28 to support the inner ends of radially disposed refractory radiants which are adapted to be piled in the basket. When the refractory radiants are piled radially, the outer ends of the radiants can extend over the upper edges of segments 31 into the path of the flame. Since the upper edges of segments 31 are substantially higher than the centrally disposed ledge 38, the radiants will be inclined at an angle to wall 39 of the heating chamber and will therefore present relatively large heat radiating surfaces toward this wall.

To facilitate piling certain ones of the refractory radiants radially, a suitable abutment 41 can be provided on the horizontal ledge 38. This abutment 41 is preferably in the form of a ring and projects above the upper surface of ledge 38. One end of each of the lowermost radiants in the pile is adapted to abut against abutment 41, thus retaining the radiants so piled securely in place. Other radiants can then be piled on and about the radially disposed radiants in any convenient manner.

The burner head can be provided on its outer periphery with a plurality of spacing lugs 43 to prevent the burner head from being positioned too closely to the heater. Preferably lugs 43 are of such size that they cause a sufficient space to be left around the burner head to allow an ample supply of air to support complete combustion of the fuel gas.

As shown in Figs. 1 to 3, the burner head is also provided with a plurality of heat dissipating fins 44. Preferably fins 44 are disposed on the lower side of the burner head for convenience, but it is to be understood that these fins can be mounted in any desired position. Fins 44 serve to dissipate heat from the burner head and thus tend to keep the burner cool. The heat thus dissipated is carried by convection currents and by radiation to the walls of the heating chamber to be thus utilized.

In heating apparatus of this character it is common to employ automatic devices controlled by clocks, thermostats, and the like to regulate the periods of operation of the heater. A pilot frame is usually employed in connection with such automatic devices and for this reason I provide a pilot 54. Frequently the pilot apparatus is mounted carelessly or by an inexperienced person and occasionally it fails to function properly on account of its being positioned inaccurately. To preclude this possibility, I prefer to fix the position of pilot 54 by providing a mounting on the burner head. This mounting is shown in detail in Fig. 8 and comprises a boss 47 on the bottom of the burner for securing a bracket 48 as by means of a screw 49. Bracket 48 carries an upstanding tube 45 within which a supply pipe 52 is adapted to be inserted. Supply pipe 52 is preferably held in position within tube 45 by depressions 51 in the tube which engage the surface of the supply pipe. A pilot tip 46 of suitable material, such as lava, is adapted to be supported on the end of supply pipe 52 in the correct position relative to the burner head. Thus, the position of the pilot is accurately fixed and it can only be mounted in a proper operative position.

The open construction of basket 18 allows heat from the flame to be imparted directly to the refractory radiants 19. A substantial amount of the heat thus imparted to radiants 19 is radiated to the side walls 39 of the heating chamber and convection currents of heated gases of combustion serve to heat the upper parts of the heating chamber. Thus, heat is transmitted efficiently to all parts of the heating chamber.

While I have described a particular embodiment of my invention, I do not wish to be limited thereto, since the invention as defined in the appended claims may be embodied in a plurality of forms.

I claim:

1. In a gas burner, a basket for supporting heat refractory material, said basket having a centrally disposed hub, a plurality of radial arms extending from said hub and a cylindrical segment mounted on the outer end of certain ones of said radial arms, each of said segments being carried by one of said radial arms only.

2. In a gas burner, a basket for supporting heat refractory material, said basket having a centrally disposed cylindrical hub, a plurality of substantially plane radial arms extending from said hub and a cylindrical segment mounted on the outer end of certain ones of said radial arms, each of said segments being carried by one of said radial arms only.

3. In a gas burner, a basket for supporting heat refractory material, said basket having a centrally disposed cylindrical hub, a plurality of substantially plane radial arms extending from said hub, a cylindrical segment mounted on the outer end of certain ones of said radial arms, and a substantially horizontally disposed ledge mounted on said hub, said ledge having a relatively large central opening therein to facilitate upward passage of convection currents of the gases of combustion and intermingled air.

4. In a gas burner, a basket for supporting heat refractory material, said basket having a centrally disposed cylindrical hub, a plurality of substantially plane radial arms extending from said hub, a cylindrical segment mounted on the outer end of certain ones of said radial arms, and a substantially horizontally disposed annular ledge mounted on said hub, said ledge having a relatively large central opening therein, and an abutment projecting from the inner edge of said ledge.

5. In a gas burner, a basket for supporting heat refractory material, said basket having a centrally disposed cylindrical hub, a plurality of substantially plane radial arms extending from said hub, a cylindrical segment mounted on the outer end of certain ones of said radial arms and a substantially horizontally disposed ledge mounted on said hub, one edge of each of said cylindrical segments being substantially higher than said ledge.

6. In a gas burner, a basket for supporting heat refractory material, said basket having a centrally disposed cylindrical hub, a plurality of substantially plane radial arms extending from said hub and a cylindrical segment mounted on the outer end of certain ones of said radial arms, each of said cylindrical segments being carried by one of said radial arms only, whereby each arm and its associated segment are free to expand and contract independently, the wider surfaces of said radial arms and of said cylindrical segments being vertically disposed, whereby relatively small edge areas only of these elements are faced toward the burner head when the basket is in operative position.

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