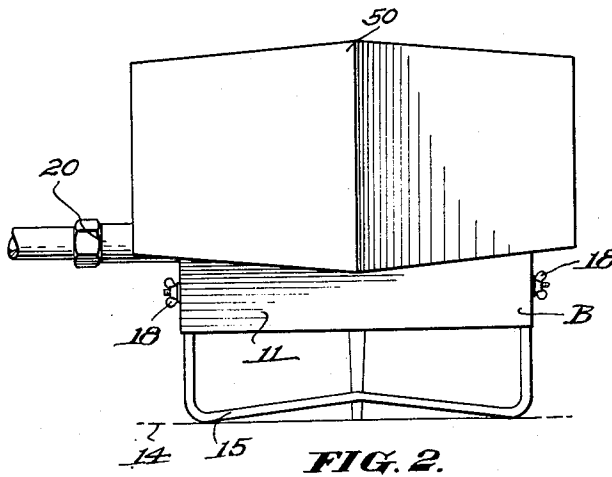
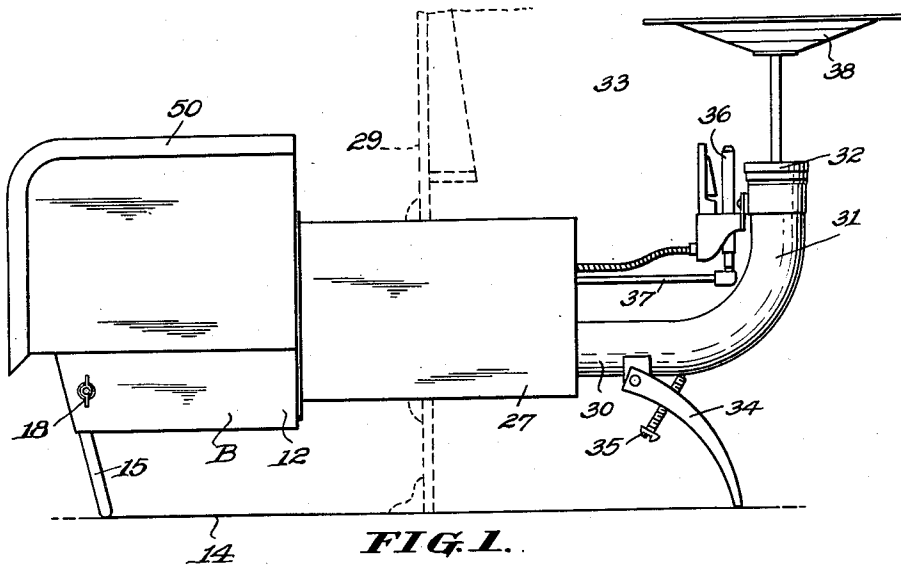


2,560,184

Filed Aug. 25, 1948

3 Sheets-Sheet 1



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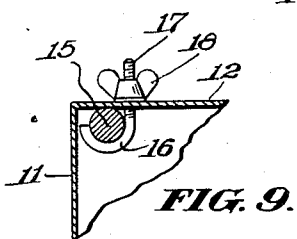
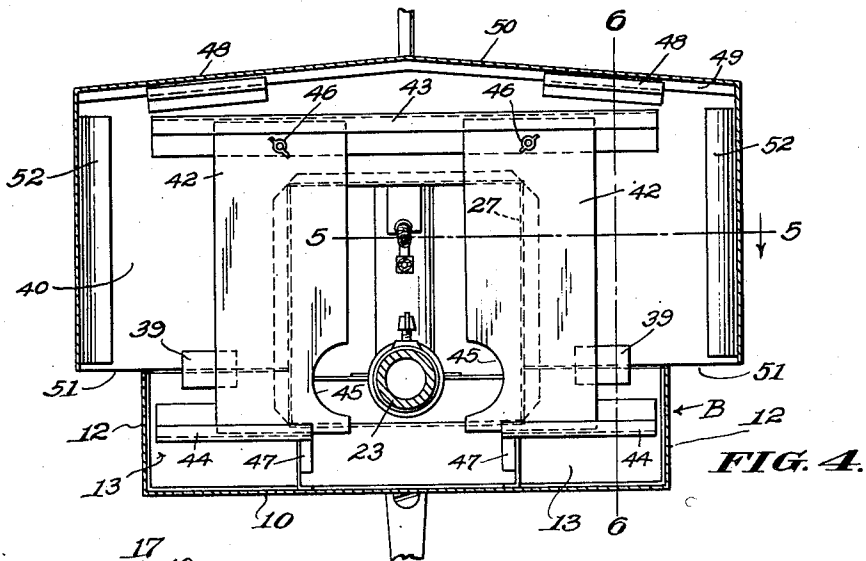
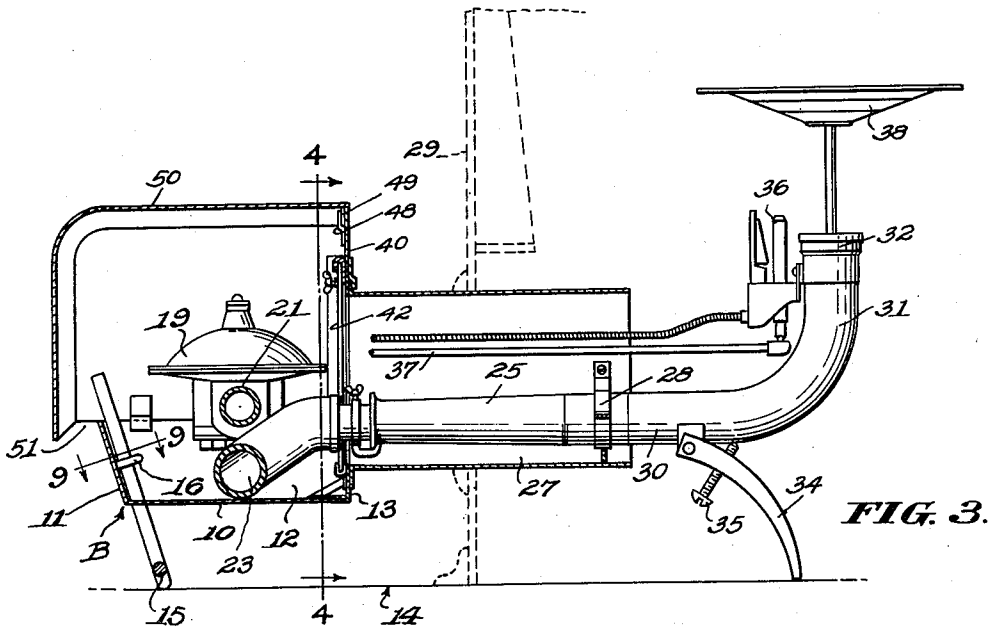
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2,560,184

GAS-FIRED CONVERSION BURNER

Filed Aug. 25, 1948

3 Sheets-Sheet 2



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GAS-FIRED CONVERSION BURNER

2,560,184

Filed Aug. 25, 1948

3 Sheets-Sheet 3

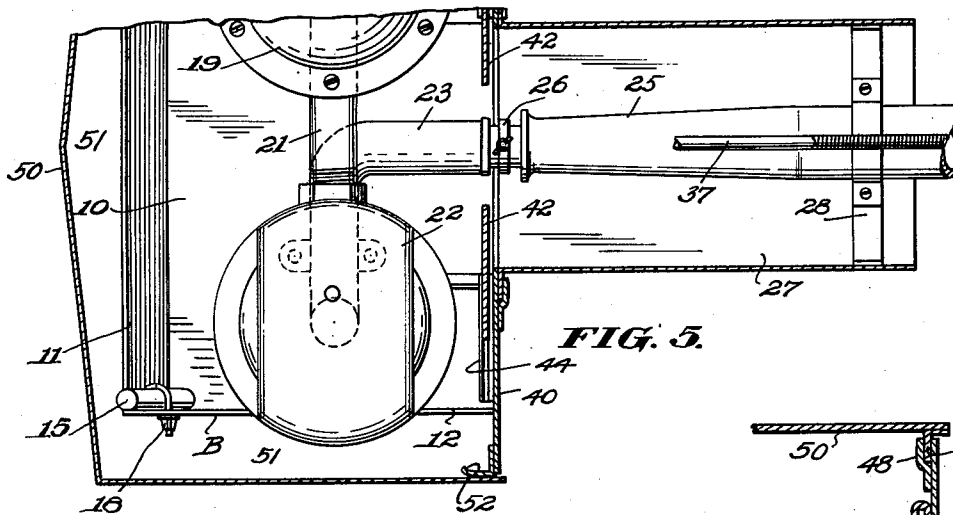


FIG. 5.

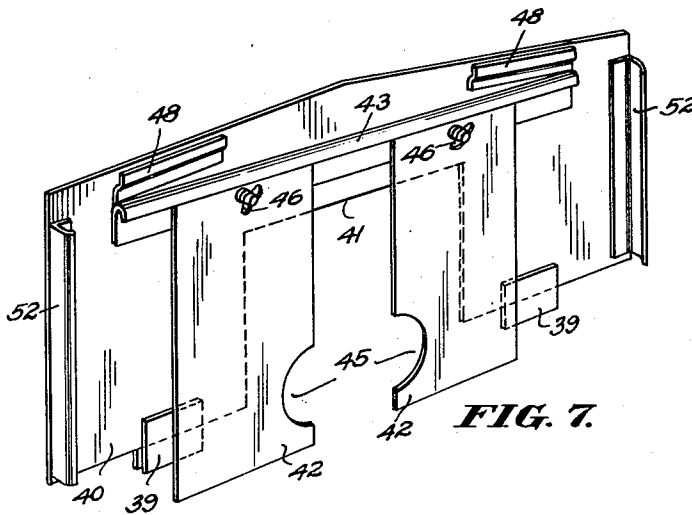


FIG. 7.

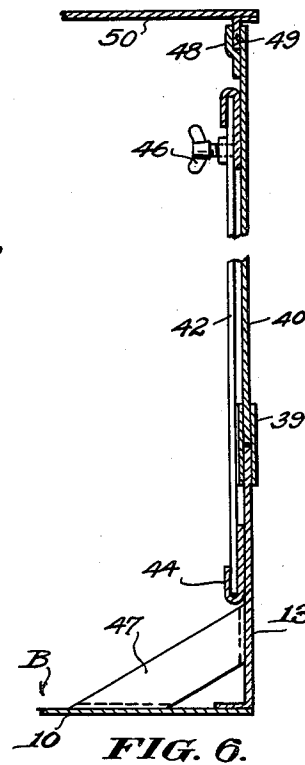


FIG. 6.

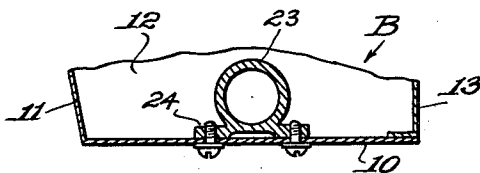


FIG. 8.

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2,560,184

GAS-FIRED CONVERSION BURNER

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Application August 25, 1948, Serial No. 46,027

3 Claims. (Cl. 158—7)

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This invention relates to conversion burners of the type adapted to be installed in house-heating furnaces and, more particularly, the invention has to do with an improved mounting and casing structure for such burners and the various associated parts thereof.

Such conversion burners comprise burner heads or sections which are adapted for installation in the lower part of a furnace in the combustion chamber thereof, and leading to these heads or sections are air and fuel conductors which extend to valves and other fluid-control instrumentalities arranged exteriorly of an associated furnace casing. For convenience in manufacture, installation and to present an attractive appearance, such conversion burners include casings and ducts in which the controlling instrumentalities are housed. In adjusting or repairing the burners, it is necessary to remove these casings, at least in part, to render conveniently accessible the burner parts or controls covered or carried thereby. Such removal of casing parts often requires considerable time and effort and is quite apt to result in disturbing the adjustment of controls, particularly air flow controlling means, to the operational detriment of the apparatus.

Therefore, the present invention has for its objects, among others, to provide a conversion burner mounting having an improved casing construction so formed as to be capable of being readily removed in whole or in part to provide convenient access to burner parts protected thereby; to provide a casing construction for such burners embodying a removable air-flow metering panel for regulating the flow of combustion air from the exterior of a furnace to the interior thereof for admixture with gaseous or vaporous fuels released from the burner head for combustion promoting and sustaining purposes; to provide such an air metering panel with relatively adjustable plates by which the effective area of an opening formed in said panel may be varied to regulate the volume of air passing through the opening to the combustion chamber of the furnace; and to provide means of this character in which the panel may be removed for access-affording purposes without affecting the adjusted positions of the plates thereon.

Additional objects and advantages of the invention may be more thoroughly understood by reference to the following description and the accompanying drawings, wherein:

Fig. 1 is a side elevational view of a conver-

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sion burner formed in accordance with the present invention;

Fig. 2 is a front elevational view thereof;

Fig. 3 is a vertical longitudinal sectional view taken through the burner and its casing structure;

Fig. 4 is a vertical transverse sectional view taken on the plane indicated by the line 4—4 of Fig. 3;

Fig. 5 is a horizontal sectional view on the plane disclosed by the line 5—5 of Fig. 4;

Fig. 6 is a detail vertical longitudinal sectional view taken on the line 6—6 of Fig. 4;

Fig. 7 is a detail perspective view of the removable air flow metering panel;

Fig. 8 is a detail transverse sectional view disclosing the mounting of the fuel inlet pipe leading the burner head;

Fig. 9 is a similar view on the line 9—9 of Fig. 3;

Referring more particularly to the drawings, the numeral 10 designates the sheet metal floor of a control-receiving box B of my improved conversion burner. The box is formed with an open top having an angularly disposed front wall 11, vertical side walls 12 and a vertical back wall 13. The box is supported in a horizontal position above a floor level 14 by a U-shaped leg member 15. The spaced upstanding portions of this leg member pass through openings in the floor 10 of the box for engagement with the hooked portion 16 of threaded bolts 17, the shanks of the latter passing through openings provided in the side walls 12. Wing nuts 18 are threaded on the threaded shanks of said bolts and, when tightened, frictionally unite the box with the bolts for support and limited adjustment.

In the present instance, the conversion burner is of the gas-fired type, and includes the customary diaphragm-type regulator 19 to which a gas supply pipe 20 extends. From the outlet of the regulator, a pipe 21 extends to a conventional control valve 22, which may be of the usual electrically operated type subject to the operation of a room-mounted thermostatic switch, not shown. From the outlet side of the control valve, a gas transmitting pipe 23, mounted on the floor 10 of the box, as indicated at 24 in Fig. 8, leads to the inlet end of a Venturi-type burner tube 25, the pipe 23 being detachably joined as at 26 with the forward end of the burner tube.

Connected with the back wall 13 of the box is an air-transmitting conduit 27 which, in this

instance, is substantially square in transverse cross section. The tube 25 is arranged in the conduit 27 and is partially supported thereby through the use of the saddle indicated at 28. The conduit 27 is adapted to project through an opening in the bottom of a furnace 29, such, for example, as the ash pit opening. In practice, around the conduit 27, the ash pit opening is usually closed and sealed by the customary application of brick and mortar thereto, so that the air delivered to the interior of the furnace for fuel combustion purposes is supplied solely through the conduit 27.

The Venturi tube 25 terminates at the rear thereof in a rear burner tube 30 which is substantially uniform in cross-sectional area throughout its length, the tube 30 terminating rearwardly in an upwardly directed elbow 31 which, at its upper end, carries a burner head 32, the latter being disposed in vertical registration with a combustion chamber 33 of the furnace. The tube 30 carries a pivoted supporting leg 34, the latter carrying a set screw 35 for the purpose of regulating its operative positions and those of the burner tube 30. The head 32 carries a pilot burner 36 and a gas supply pipe 37 of small diameter leads from the control valve 22 to the pilot burner, maintaining possibly a small flame for effecting ignition of fuel released from the head 32. Above the head 32, there is mounted a saucer-shaped flame distributor 38. It will be understood that the specific construction of the regulator 19, the control valve 22, the burner head 32 and the pilot burner 36 do not form a part per se of the present invention.

The back wall 13 of the box B is provided, in this instance, along its upper edge with stationary pairs of cleats 39, the latter forming sockets in which are received the lower edge portions of the vertically positioned air flow metering panel 40. As shown more particularly in Figs. 4 and 7 of the drawings, this panel is provided intermediately of its length with a rectangular cut-out region 41, constituting an air aperture and through which air flowing from the front of the burner may travel under metered flow into the conduit 27 and thence to the combustion chamber of the furnace. It will also be noted that the joined ends of the pipe 23 and the tube 25 pass through and are positioned in this opening. To control the effective area of the opening 41, I utilize a pair of flat shutter plates 42, which are substantially rectangular in configuration. The upper edges of these plates are guidingly received in the flanged ends of a stationary guide strip 43 carried by the front wall surface of the panel 40, while the lower edges of the plates 42 are similarly received in guide strips 44, the latter being stationarily mounted on the front surface of the back wall 13 of said box. The adjacent vertical side edges of the plates 42 may be arcuately recessed as at 45 to conform with the configuration of the pipe 23 when the shutter plates are brought into close proximity with each other. Winged set screws 46 are threadedly carried by said plates and frictionally engage with the strip 43 to maintain the plates in their various positions of relative adjustment.

It will be seen that by sliding the plates toward or away from each other, the effective area of the air metering opening 41 may be readily controlled. The back wall 13 may be braced and rendered rigid by the employment of the diagonal brace elements 47 indicated in Figs. 4 and 6. Adjacent to its upper edge, the panel 40 has

fixed thereto cleats 48 which receive a flange 49 depending from the rear edges of a removable cover member 50 which, in combination with the box B, houses the regulator 19 and the control valve 22. The horizontal dimensions of the cover member are somewhat greater than those of the box B, so that air-admitting openings or slots 51 of an unobstructed character are formed between the adjacent portions of said box and cover member. The side edges of the panel 40 may be provided with vertically disposed guide strips 52 for guiding cooperation with the side walls of the cover member.

In view of the foregoing, it will be seen that when the burner assembly is mounted in association with a furnace, access to the control parts thereof may be readily had by removing the cover member 50. When this is done, the regulator 19 and the control valve 22 will be instantly accessible. If it is desired to adjust or ignite the pilot burner, the removal of the cover member permits the panel 40 to be removed from engagement with the box B, so that access to the pilot burner may be attained through the air conduit 27. It will be noted that the removal of the panel 40 from its normal operative position need not affect the adjustment of the shutter plates 42, since the adjustment of the latter may be maintained through the set screws 46. However, if adjustment of the plates is indicated, the removal of the cover members render said plates readily accessible. By virtue of these features, it will be seen that the present invention provides a conversion burner which may be easily installed in association with a furnace, and after installation, the several parts thereof will at all times be conveniently accessible for adjustment and repair purposes.

I claim:

1. A casing structure for gas-fired conversion burners of the type employing fuel flow control valves, a burner head for insertion within a furnace, and a gas-supplying conduit extending from said control valves to said burner head, said casing structure embodying a main box-like section formed for the reception of the control valves and a part, at least, of said conduit, said section opening to the atmosphere through at least one of the walls thereof, a vertical back wall for said main section having a fixed opening formed therein and through which said gas-supplying conduit extends, an air-flow conduit leading from the opening in said back wall to said burner head and housing said gas-supplying conduit, adjustable shutter devices carried by said back wall and movable with respect to the opening therein for controlling the passage of air from said main section into said air-flow conduit, and linearly disposed guides provided on said back wall for the slidable reception of said shutter devices.

2. In a conversion burner of the type having a fuel burner for disposition within the combustion chamber of a furnace and a duct arranged to extend through a wall of a furnace in which said fuel burner is positioned for conducting combustion air to said fuel burner; a casing structure connected with one end of the duct and having a removable back wall formed with an opening communicating with the duct, said casing structure being open to the atmosphere to provide for the flow of combustion air into said structure, through the opening in said back wall, and through the duct; and shutter means carried on the back wall of said casing structure for sliding movement in a plane parallel to said back wall

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and into and out of registration with the opening formed in said back wall, said shutter means being movable to vary the effective size of the opening formed in said back wall, and thereby to control the flow of combustion air through the duct of said conversion burner.

3. A casing structure for gas-fired conversion burners of the type utilizing fuel flow-controlling valves, a burner head adapted to be positioned in a furnace, and a gas-supplying conduit extending from said control valves to said burner head, said structure embodying a main box-like section formed for the reception of the control valves and a part, at least, of said conduit, said section having front and side walls and being provided with an unobstructed opening for the admission of atmospheric air into the valve-containing interior of said section; a vertical back wall for said main section having a fixed opening formed therein and through which said gas-supplying conduit extends; an air-flow conduit communicating at one end with the opening in said back wall and extending outwardly therefrom and housing said gas-supplying conduit; linearly disposed guide means provided on said back wall; and adjustable shutter devices slidably carried in said guide means and movable

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with respect to the opening formed in said back wall for controlling the amount of air entering said air-flow conduit from said main section, said shutter devices being arranged within said casing structure between said back wall and said fuel flow-controlling valves.

EDWARD A. NORMAN, JR.

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