Nov. 10, 1953 G. E. HUGHES ET AL 2,658,569

BURNER MOUNTING FOR WARM AIR HEATERS

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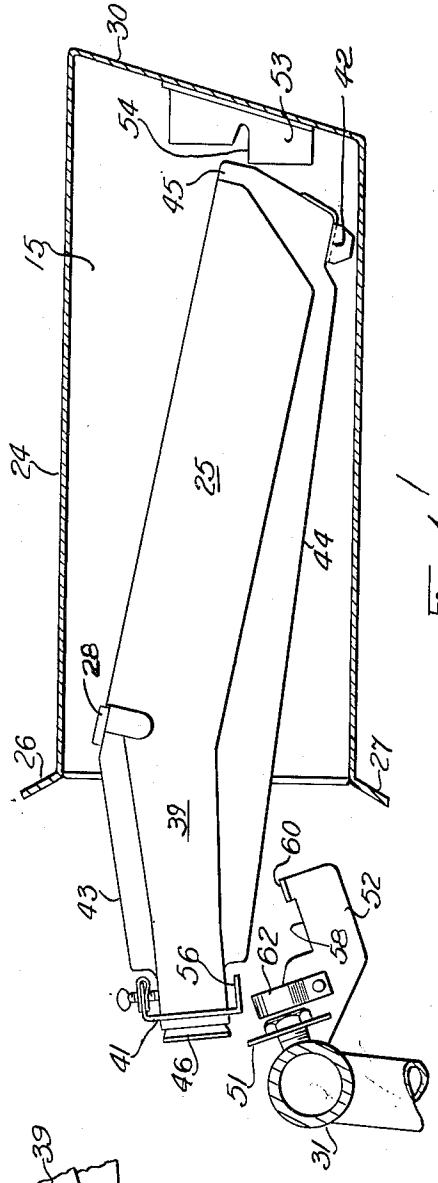


Fig. 1

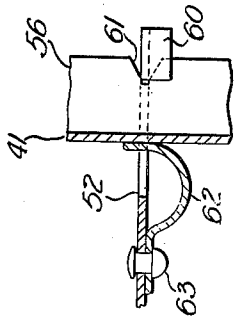


Fig. 3

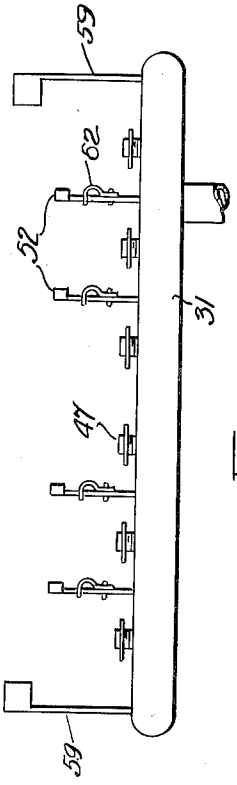


Fig. 4

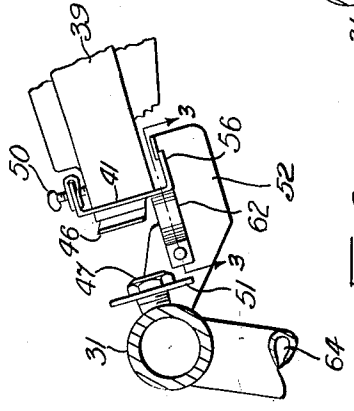


Fig. 2

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Fig. 7

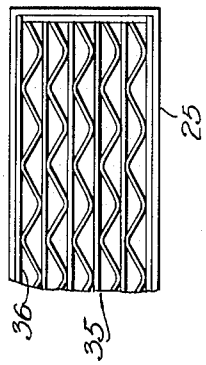


Fig. 5

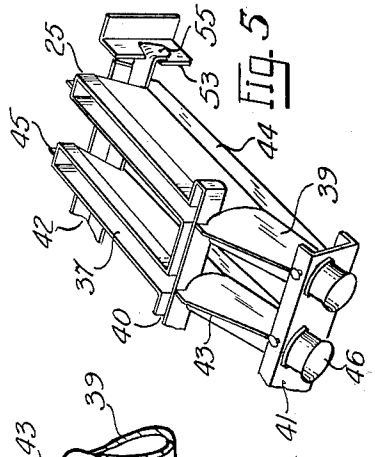
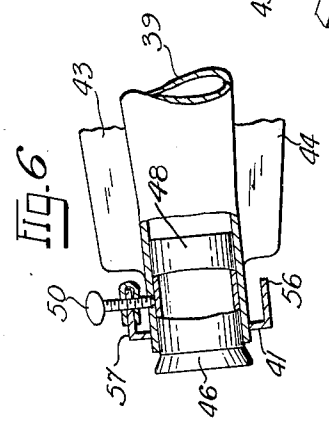


Fig. 6



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BURNER MOUNTING FOR WARM AIR HEATERS

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3 Claims. (Cl. 158—104)

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This invention relates to a burner mounting for warm air heater of the type embodying within a relatively tall cabinet an upper compartment for a radiator for heating a current of air passing therethrough, a compartment therebelow for a burner for internally heating the radiator, and a still lower compartment for a blower for producing the current of the air to be heated. In a heater of this type the accessibility of the burner for inspection and servicing has an important bearing on the utility of the heater and it is the general object of the invention to provide improvements which shall contribute to the ready accessibility of the burner and at the same time result is simplified manufacturing operations. For a consideration of what we consider to be novel and our invention attention is directed to the following specification and the claims appended thereto.

In the accompanying drawings forming part of this specification—

Fig. 1 shows a burner in a position preparatory to removing it from a burner compartment or preparatory to positioning it at its operation station in said compartment.

Fig. 2 shows how the front end of the burner shown in Fig. 1 is normally supported in relation to the parts adjacent thereto.

Fig. 3 is a fragmentary sectional view on line 3—3 of Fig. 2.

Fig. 4 is a plan view of a detail.

Fig. 5 is a perspective view illustrating how a plurality of burner elements are interconnected in side-by-side relation to form a unitary assembly for ignition and mounting purposes.

Fig. 6 is a vertical sectional view of the front portion of one of the burner elements.

Fig. 7 is an enlarged fragmentary plan view of the top side of a burner element.

A series of burners 25 are disposed in the burner compartment 15 of a warm air heater defined by a sheet metal wall running from upper and lower diverging walls 26 and 27 to back wall 30. It will be understood that the top wall 24 is apertured to pass heating gases from the burner through a heat exchanger, hence the wall 24 is the lower tube sheet of a heat exchanger.

A gas supply pipe or manifold for the several burners 25 is indicated at 31, the same having as many gas discharge nozzles 47 as there are burners 25. The main gas line which delivers to said manifold is indicated at 64. The manifold is supported in fixed position by supporting brackets 59 secured to appropriate supporting structure within the cabinet of a warm air heater.

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A runner pilot 28 in transversely extending gas conducting channel 40 between adjacent burners serves to ignite all burners at substantially the same time. The top side of the channel comprises a longitudinal series of gas ports such as may be formed by arranging a corrugated metal strip between a pair of straight metal strips (see Fig. 7). Each of the burners 25 comprises a hollow head 37 the top side of which comprises a longitudinal series of gas ports formed by a bundle 35 of alternating straight and corrugated metal strips within a frame 36. Each of the burners 25 also comprises a mixing tube 39 which extends at a downward slant from the front end of the burner head. As best shown in Fig. 5, the body of each burner 25 may be fabricated from right and left hand sheet metal stampings provided with extended selvage edges 43, 44 and 45 to impart stiffness to the burner body as a whole. The burners 25 are interconnected by front and rear load supporting cross bars 41 and 42 to simplify the problem of mounting and aligning the burners in their station in the burner compartment 15.

The rear cross bar 42 is adapted to be removably seated on flat ledges 54 on laterally spaced brackets 53 secured to the back wall 30 of the burner compartment, the distance between the brackets being such that downturned ends 55 on the cross bar cooperate with the sides of the brackets to prevent lateral displacement of the cross bar. The manner of supporting the front cross bar will presently appear.

The front cross bar 41 is a channel iron and the front end of mixing tubes 39 extend through the web of the same. The top flange 57 of the channel iron serves as a support for a thumb screw 50 which bears against an axially adjustable sleeve 43 within the front end of each mixing tube to serve as an adjustable extension thereof for reasons presently appearing, the sleeve having a flaring mouth 46. The lower flange 56 of the channel iron is adapted to be removably seated on laterally spaced brackets 52 carried by and extending forwardly from the gas supply pipe or manifold 31. The front or leading end of each bracket has a laterally extending finger 60 a level sufficiently higher than the bar-supporting seat 58 thereon to permit the bottom flange 56 of the front cross bar 41 to extend thereunder for the purpose of locking the cross bar in place against upward displacement. The cross bar 41 is held against lateral displacement on the brackets 52 by a V-shape notch 61 in the leading edge of the bottom flange 56, the notch straddling the ped-

estal of which the lateral finger **60** constitutes the top, and said bar **41** is held in that position by a latch **62** adapted to be swung into position behind the cross bar (as will be readily understood by reference to Fig. 3), the latch being mounted on a pin **63** supported by the bracket **52**.

When the front cross bar **41** is seated and locked in position on the brackets **52**, the gas intake ends the mixing tubes **39** are in axial alinement with the individual gas discharge nozzles **47** mounted on the gas supply manifold **31**. The jet of gas issuing from the gas nozzles entrains primary air and the amount of air thus entrained is controlled by axial adjustment of the sleeve **48** relative to a fixed disk or shutter **51** mounted on each gas nozzle **47**. It will be understood that the sleeve **48** must be in retracted position to permit the front cross bar **41** to be placed on and removed from the supporting brackets **52**.

Referring to Fig. 1, it will be noted that the ready removability of the burner assembly from the burner compartment **15** results in part because the mixing tube **39** is downwardly inclined relative to the top side of the burner head from which it projects. The supporting of the rear cross bar **42** at a level to permit the rear end of burner assembly to drop to a lower level is of course also a contributing factor. Aside from the ready removability of the burner assembly from the burner compartment it will be readily appreciated that the factory assembly operations are substantially simplified thus substantially reducing the cost of manufacture of the heater as a whole.

What is claimed as new is:

1. In apparatus of the class described, in combination, a pair of burners each comprising a hollow and horizontally elongate burner head adapted to be arranged with its top side in a horizontal plane and having gas discharge ports in its top side and a mixing tube communicating with the interior of said burner head to discharge a mixture of air and gas thereinto, front and rear cross bars respectively secured to the front end of the mixing tubes and to the rear end of the burner heads to maintain said burners in spaced relation, a horizontally extending gas supply pipe parallel with said front cross bar and having a pair of forwardly discharging, spaced gas nozzles in the side thereof, support means for supporting said burners in spaced, gas receiving relation to said nozzles comprising a bracket mounted on said pipe between said nozzles and arranged to support said front cross bar at a point between the nozzles, and means supporting said rear cross bar.

2. In the apparatus according to claim 1, in combination, said bracket having a seat whereon said cross bar is removably mounted and the seat being long enough to permit the first cross bar to be moved a limited distance back and forth thereon, and complemental means on said front cross bar and bracket for holding said cross bar against upward displacement with respect to said gas supply pipe.

3. In the apparatus according to claim 2, in combination, an axially slideable extension for each mixing tube at its front end for individually adjusting each mixing tube with relation to its associated gas nozzle.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,411,063	Needham	Mar. 28, 1922
1,684,457	Sharp	Sept. 18, 1928
1,908,668	Hollman	May 9, 1933
2,076,479	O'Connell	Apr. 6, 1937
2,253,834	Volks	Aug. 26, 1941
2,289,759	Denise	July 14, 1942
2,467,626	Norman	Apr. 19, 1949

FOREIGN PATENTS

Number	Country	Date
687,453	France	Apr. 28, 1930