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G. HEIN

3,512,910

BURNER ASSEMBLY, MORE PARTICULARLY FOR GAS WATER HEATERS

Filed April 26, 1968

2 Sheets-Sheet 1

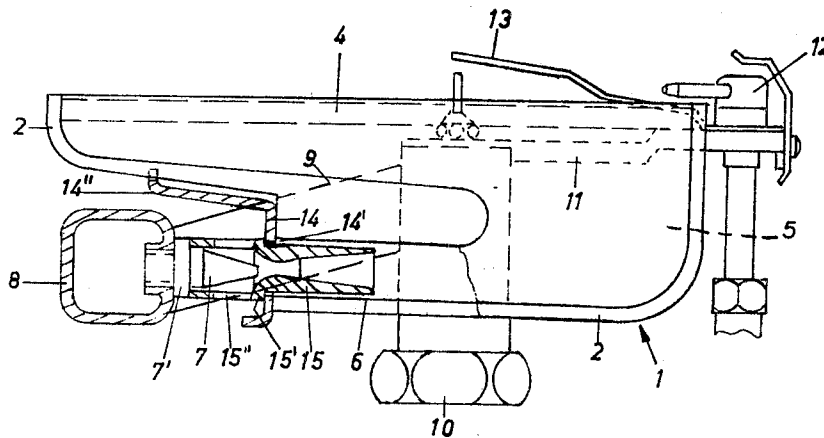


Fig. 1

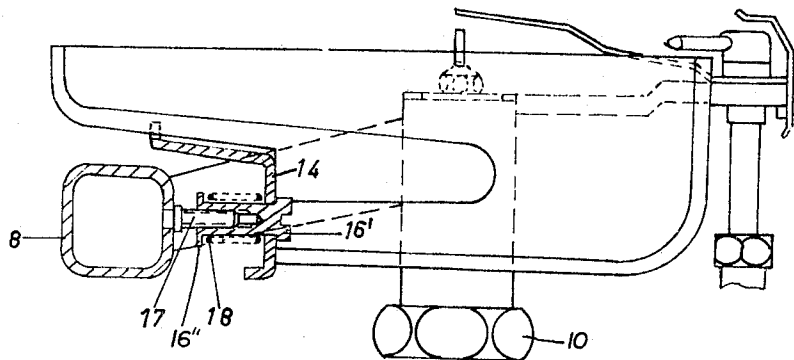


Fig. 2

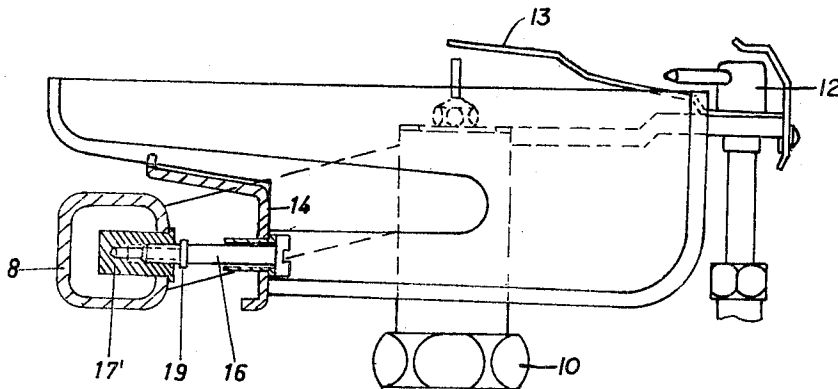


Fig. 3

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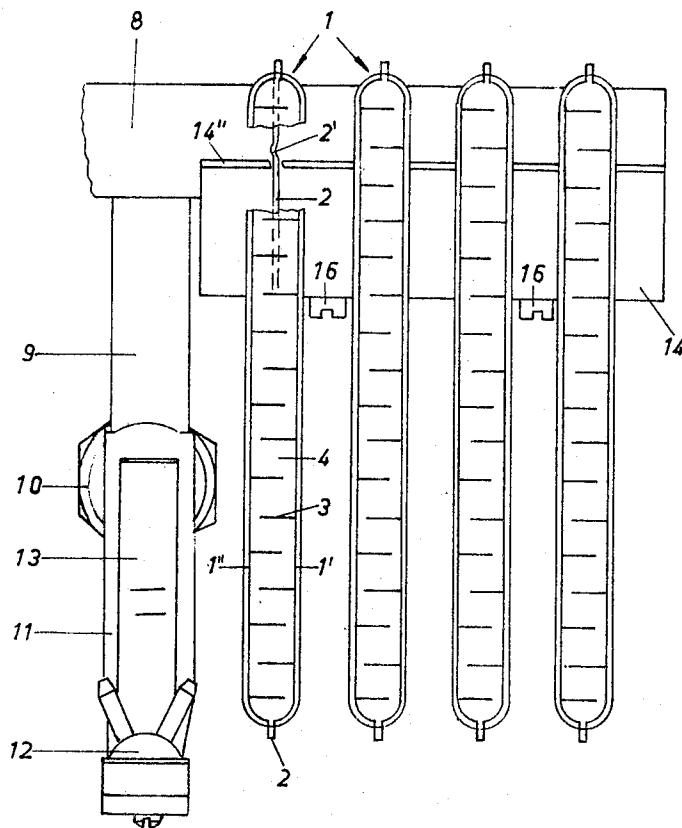
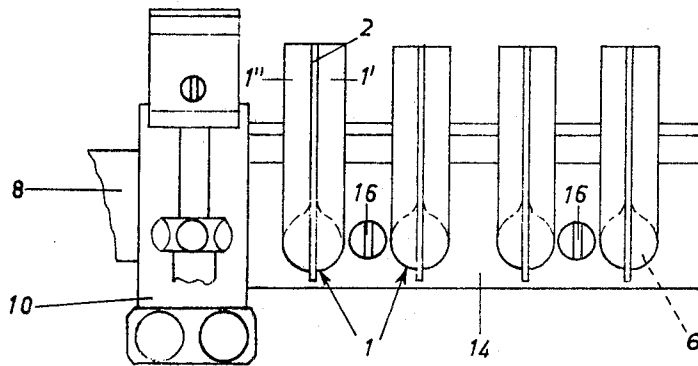
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BURNER ASSEMBLY, MORE PARTICULARLY FOR GAS WATER HEATERS

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4 Claims

ABSTRACT OF THE DISCLOSURE

A burner assembly having a plurality of individual burners, in particular for gas water heaters, in which each individual burner comprises two embossed sheet metal cups, joined to each other and forming a horizontally disposed mixing chamber and having a strip-shaped burner insert, provided with gas discharge openings and forming the upper boundary of the mixing chamber and in which the individual burners are adjacently allocated to one gas discharge nozzle of a common T-shaped distributor pipe which extends laterally and is fixedly connected to a central connecting member screwmounted to the gas supply line, characterised in that the individual burners are joined to form one grid each by means of a rail having an opening disposed in front of the nozzles and being detachably screwmounted by means of said rail on that part of the distributor pipe which supports the nozzles.

This invention relates to a burner assembly comprising several individual burners, more particularly for gas water heaters.

The specification of U.S. Pat. 3,288,196 discloses a burner assembly as set out above and comprising a plurality of individual burners, in which each individual burner comprises two pressed sheet metal cups, joined to each other and forming a horizontally disposing mixing chamber and a strip-shaped burner insert, provided with gas discharge apertures and forming the upper boundary of the said mixing chambers. The individual burners are each associated with a respective gas discharge nozzle. The nozzles are mounted on a common T-shaped distributor pipe which is laterally cantilevered and fixedly connected to a central connecting member, threaded to the gas supply line. The prior patent also discloses an embodiment of such a burner assembly in which all individual burners on both sides are joined by connecting rails to form a removable grid. One connecting rail is joined by a screw to an extension of the central connecting member. At the opposite ends of the individual burners they rest on that part of the T-shaped distributor pipe which supports the nozzles. It has been found that certain difficulties occurred in the lateral withdrawal of the grid formed by all individual burners since the grid thus formed has to be pushed over the ignition burner mounted on the extension of the central connecting member and over the bimetallic spring which functions as an ignition safety device. Moreover, there is no guarantee that on the reinsertion of the grid the nozzles will always be centrally positioned relative to the discharge opening of the individual burners.

The object of the invention is to facilitate the assembly of the burner and to simplify manufacture while avoiding the aforementioned disadvantages. According to the invention, the burner, whose principle corresponds to that disclosed in the specification of the patent above referred to, is so constructed that the individual burners disposed on both sides of the connecting member are each combined to form a grid by means of a rail having an aperture

disposed upstream of the nozzles and being detachably screwmounted by means of the aforementioned rail on that part of the distributor part which supports the nozzles. Two grids, formed by individual burners, are thus provided which can easily be withdrawn from the side without the withdrawal movement being obstructed by the ignition burner or by the bimetallic spring.

Appropriately, a diffusion pipe, provided with lateral primary air intake openings is inserted into the openings of the rail and into the intake opening of the individual burners, said intake openings being disposed behind the openings of the rail. The diffusion pipe extends over the nozzle and abuts a collar on the nozzle. It also has a collar which abuts the rail. Mounting of the rail is therefore accompanied by centering of the nozzles relative to the discharge openings of the individual burners.

In an additional feature of the invention, the rail comprises a sheet metal part bent at an angle having an upwardly bent edge. The edge has notches into which a folded edge of each individual burner engages, whereby the position of each individual burner relative to the rail will be fixedly located without any noticeable effort. The system can be so arranged that that part of the distributor pipe which supports the nozzles is constructed as a tube of rectangular section, screwmounting means for securing the rail being provided on the front surface of said square section tube between two nozzles. The rail and the nozzles can more readily be mounted on such a pipe of rectangular section than on a distributor pipe of circular cross-section.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

FIG. 1 is a vertical partial section along the plane of the nozzle;

FIG. 2 is a vertical partial section along the plane of the rail mounting;

FIG. 3 shows a modified construction of rail mounting;

FIG. 4 shows a grid as seen from the front;

FIG. 5 shows a grid as seen from above.

The numeral 1 indicates generally an individual burner comprising two sheet metal cups 1', 1'', joined to each other by a folding seam 2, and an adjoining burner insert 4, having gas discharge slots 3. The sheet metal cups 1', 1'' form an approximately V-shaped, horizontally disposed mixing chamber 5 which has a cylindrical opening 6. Each such individual burner 1 is disposed in alignment with a nozzle 7. The nozzles are positioned at spaced intervals and are threaded into a rectangular section distributor pipe 8. Each nozzle has a collar 7'. The rectangular section distributor pipe 8 forms part of a T-piece 9 extending to one side and being connected to a vertical connecting member 10. The connecting member 10 is screwmounted to the gas supply pipe, and has an extension 11 with an ignition burner 12 and with the bimetallic spring 13 of an ignition safety device mounted thereon. The individual burners 1, being adjacently disposed in front of the nozzles 7, are connected to each other by a sheet metal part bent at an angle, that is to say a rail 14 and are combined to form a grid so that the individual burners disposed on the right-hand side of the connecting member 10 as well as those on the left side, not shown, each form such a grid. In front of each nozzle 7, the rail 14 has an opening 14'. One diffuser pipe 15 each is inserted into the opening 14' and into the opening 6 of each individual burner 1 which is disposed behind the opening 14'. A collar 15' of the diffuser pipe 15 bears against the rail 14 and is retained in the slightly resilient opening 6 by clamping action. That part of the diffuser pipe 15 which is cantilevered and extends beyond the nozzle 7 is provided with intake openings 15'' for the drawing-in of

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primary air. The insertion of the diffuser pipe 15 causes the rail 14 and a plurality of adjacently disposed individual burners to be retained together. An upwardly bent edge 14'' of the rail 14 is provided with notches into each of which a folded edge 2 of a respective individual burner 1 engages. The folded edge 2 is deformed at 2' closely adjacent to the cut (see FIG. 5) in order to improve the positional locating between individual burner 1 and rail 14. Thus, the edge 2 abuts the outer face of rail 14 (about and above opening 6) and the opposite face of rail 14 at 2' to hold the burner 1 in place.

The rail 14 is screwmounted on the rectangular section pipe 8 by means of screws 16, which are each disposed between two adjacent nozzles 7. To this end, an as illustrated in FIG. 2, the pipe 8 may be provided with a threaded bolt 17 on to which a hollow screw 16' is secured. A compression spring 18 is positioned between the rail 14 and a collar 16'' on the screw 16'. When the screws 16'' are tightened, the end edges of the diffusion pipes 15 will then bear against the collars 7' of the nozzles 7 to hold the rails spaced from the pipes.

It is also possible, as illustrated in FIG. 3, for threaded sockets 17' to be inserted into the rectangular section pipe 8 with the screws 16 secured to said sockets, the screws extending through the rail 14 and being secured against dropping out by means of a spring retaining ring 19.

I claim:

1. In a gas burner assembly for gas water heaters and the like comprising a T-shaped gas distributor pipe having a centrally located, threaded gas supply connection and two arms having gas discharge openings, fluid supply means at each of said openings and connected to said pipe, and a plurality of individual burners each of which is associated with a respective one of the gas discharge openings, each burner comprising two sheet metal cups joined about their outwardly extending edges and defining a central mixing chamber with a top aperture across which is a strip shaped burner insert, each burner having an opening at one end adjacent the bottom aligned with a respective supply means, the improvement comprising: two rails each extending approximately the length of one of said arms and positioned at one side of and parallel to a respective one of said arms, said rails having a plurality of openings each aligned with a respective supply means, each rail supporting the burners associated with the respective arms;

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a plurality threaded attachment means releasably securing the rails to said arms and positioned between individual burners, said attachment means holding the rails a spaced distance from the arm; and connecting means forming a part of said rail and said burners for releasably holding said burners against displacement longitudinally thereof with respect to said rail.

2. In an assembly as set forth in claim 1, wherein each fluid supply means comprises a nozzle member and diffuser member telescoped together, said nozzle member being threaded into said pipe, said diffuser member having a portion between the arm and the rail, said portion having primary air intake openings and an external collar abutting the rail whereby the rail will hold said two members in telescopic relationship, said diffuser member extending through a respective rail opening and into a respective burner opening.

3. In an assembly as set forth in claim 2, wherein each rail is formed of sheet metal having an upstanding edge with a plurality of notches therein with each notch being positioned to receive an outwardly extending edge of a respective burner means, each burner means having parts abutting opposite sides of the rail.

4. In an assembly as set forth in claim 1, wherein each rail is formed of sheet metal having an upstanding edge with a plurality of notches therein with each notch being positioned to receive an outwardly extending edge of a respective burner means, each burner means having parts abutting opposite sides of the rail.

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U.S. Cl. X.R.

239—450, 600; 431—343, 354