June 4, 1963 E. G. PHLAUM 3,092,168

CROSS LIGHTER FOR A GAS BURNER ASSEMBLY

Filed Aug. 6, 1959 2 Sheets-Sheet 1

Fig. 2.

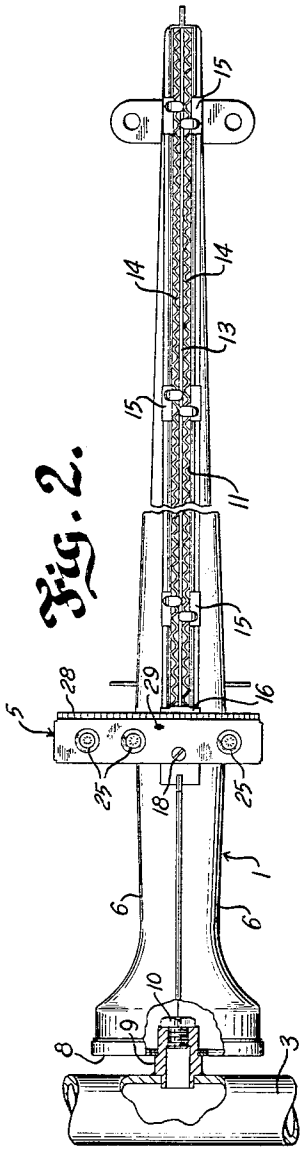


Fig. 3.

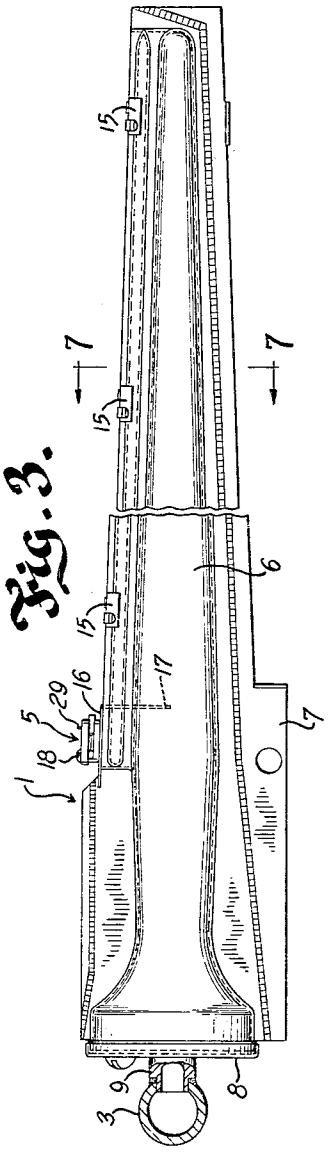
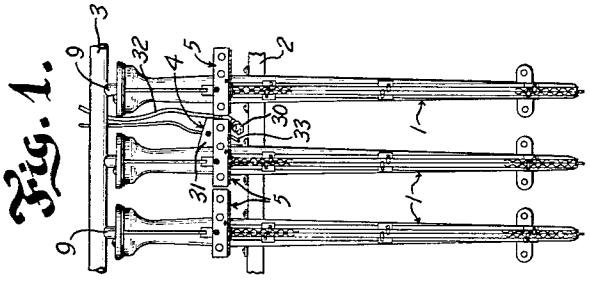


Fig. 1.



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Filed Aug. 6, 1959 2 Sheets-Sheet 2

Fig. 4.

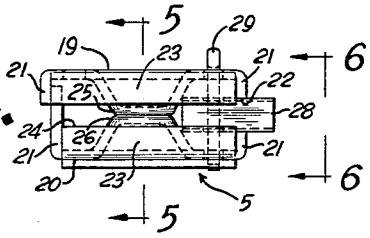


Fig. 5.

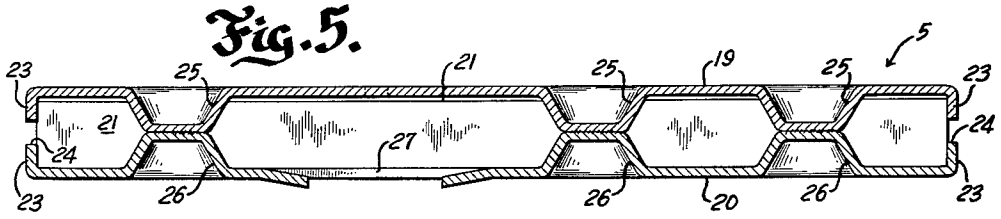
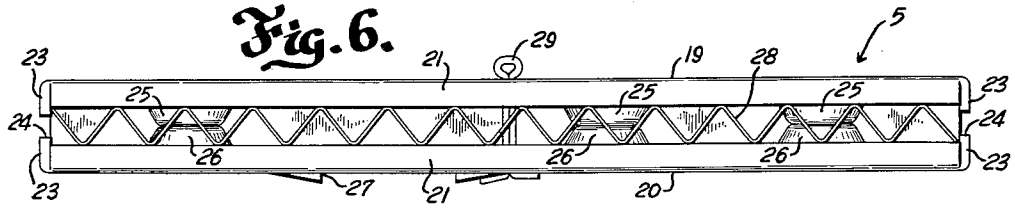


Fig. 6.



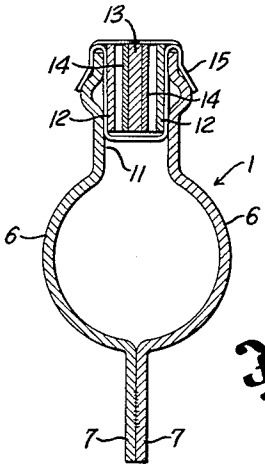


Fig. 7.

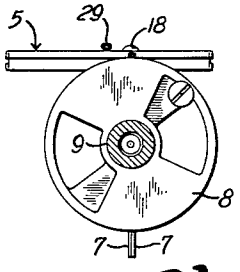


Fig. 8.

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CROSS LIGHTER FOR A GAS BURNER ASSEMBLY

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3 Claims. (Cl. 158—115)

This invention relates to a gas burner assembly and more particularly to a cross lighter for a gas burner assembly.

In a multiple gas burner assembly in which a series of elongated gas burners are mounted in parallel relation, a single pilot burner is employed and a cross lighter is used to distribute the flame to each burner in the series.

Each gas burner is provided with an inlet at one end which is connected to a gas manifold and is provided with an elongated outlet located in the upper portion of the burner. A cross lighter is secured to the upper surface of each burner inwardly adjacent the gas outlet and serves to project the flame toward the outlet to thereby ignite the gas at the burner outlet.

According to the invention, the cross lighter is disposed normally to the axis of the burner and the ends of the cross lighter project laterally beyond the sides of the burner. The cross lighter has a generally box-shape cross section with open ends and the open ends of each cross lighter are disposed in alignment with the open ends of the cross lighters of the adjacent burners to provide, in effect, a continuous cross lighting strip. An opening is provided in the lower surface of each cross lighter which communicates with the interior of the burner and permits gas from the burner to pass upwardly into the cross lighter.

In addition, a baffle is disposed within the burner and serves to direct the gas toward the opening leading to the cross lighter.

Each cross lighter is provided with a slot which faces the burner outlet and a corrugated strip is disposed within the slot. The corrugated strip serves to maintain the spacing of the slot in the cross lighter and provide a sharp flame which is projected toward the burner outlet.

With the use of the present invention, a single standard size cross lighter is employed, regardless of the output of the burner assembly. For example, the output of a gas burner unit or furnace can be varied by changing the number of burners in the unit. As the cross lighter of the invention is attached to each burner, a standard size cross lighter is employed, regardless of the number of burners used. As the cross lighters are disposed in end-to-end relation, in effect, a continuous cross lighter is provided which extends completely across the burners in the series.

As each cross lighter is separate from the remaining cross lighters in the series, there is no excessive contraction and expansion of the cross lighter during heating and cooling periods. Thus, warpage and stress of the metal is substantially reduced.

The corrugated strip, which is employed in the slot in the cross lighter, serves to hold a short and hard flame and directs the flame toward the burner outlet and away from the heat exchanger which is disposed upwardly of the burner.

Other objects and advantages will appear in the course of the following description.

The drawings illustrate the best mode presently contemplated of carrying out the invention.

In the drawings:

FIGURE 1 is a top plan view of the burner assembly;

FIG. 2 is a top plan view with parts broken away in section of a single burner;

FIG. 3 is side elevation of the burner of FIG. 2;

FIG. 4 is an enlarged end view of the cross lighter;

FIG. 5 is a section taken along line 5—5 of FIG. 4;

FIG. 6 is side elevation of the cross lighter taken on line 6—6 of FIG. 4;

FIG. 7 is a transverse section of the burner taken along line 7—7 of FIG. 3; and

FIG. 8 is an end view of the burner showing the shutter plate.

The drawings illustrate a gas burner assembly including a plurality of elongated sheet metal burners **1** which are secured in generally parallel relation to a support bar **2**. Gas is supplied to each of the burners **1** through a manifold **3**. A pilot burner unit **4** is employed to ignite the gas at one of the burners and cross lighters **5** serve to distribute the flame to the adjacent burners in the series.

Each of the burners **1** is composed of two sheet metal halves **6** which are provided with vertical flanges **7** secured together by welding. The inner end of the burner is enclosed by an adjustable shutter plate **8** having a series of openings to admit air to the burner. Gas is supplied to the burner through a conduit **9** which connects the manifold **3** and the shutter plate **8**. A spud **10** is threadedly disposed within the conduit **9** and controls the rate of flow of gas into the burner.

Each burner **1** is also provided with an elongated outlet slot **11**. The outlet **11** is subdivided into a plurality of small orifices or openings by a ribbon insert which includes a pair of side strips **12** and a central strip **13**. A pair of corrugated strips **14** are disposed between the side strips **12** and the central strip **13** and the gas is discharged from the interior of the burner between the corrugations in strip **14**. The strips **12, 13** and **14** are secured within the slot by a plurality of sheet metal clips **15**.

Each cross lighter **5** is secured to the respective burner **1** by means of a generally L-shaped bracket **16**. One end of the bracket **16** is welded to the upper surface of the burner and the lower end **17** of the bracket extends downwardly within the interior of the burner.

The cross lighter is secured to the bracket **16** by a screw **18** which extends through the cross lighter and is secured into the bracket.

The cross lighters **5** are disposed generally normal to the axes of the burners and the ends of the cross lighters project laterally beyond the sides of the respective burner. The ends of the cross lighter are disposed in alignment so that, in effect, a continuous cross lighter is provided across the entire burner assembly.

Each cross lighter comprises an upper member **19** and a lower member **20** which are provided with both side and end flanges. As best shown in FIG. 4, the side flanges **21** of the members **19** and **20** are disposed in overlapping relation at the rear or inner edge of the cross lighter and are welded in the overlapping position. The side flanges at the forward edge of the cross lighter are spaced apart to provide a slot **22** which faces toward the outlet opening **11** of the burner. In addition, the flanges **23** at the ends of the members **18** and **19** are spaced apart to provide openings **24** which are disposed in alignment with corresponding openings of the adjacent cross lighters.

To reinforce the cross lighter, the upper member **19** is provided with a series of inwardly projecting dimples **25** which are disposed in alignment with corresponding dimples **26** formed in the lower member **20**. The dimples are welded together to provide rigidity for the cross lighter.

The lower member **20** of the cross lighter is also provided with an opening **27** which is disposed in alignment with openings in the bracket **16** and burner **1** and thereby

provides communication between the interior of the burner and the cross lighter so that gas can flow upwardly into the cross lighter. The lower end **17** of the bracket **16** serves as a baffle and directs the incoming gas upwardly through the opening **27** into the cross lighter.

A corrugated strip **28** is disposed within the slot **22** and extends substantially the entire length of the cross lighter. The strip **28** divides the slot **22** into a series of small openings so that the flame from the cross lighter can be directed outwardly through openings defined by the corrugated strip toward the burner outlet **11**.

The dimples **25** and **26** serve to position the corrugated strip **28** within the slot, for the rear edge of the corrugated strip engages the dimples and is thereby properly located within the slot **22**.

The strip **28** serves to hold the flame short and hard and prevents the flame from being thrown upwardly against the heat exchanger.

The corrugated strip is secured within the slot by a cotter pin **29** which extends through the members **19** and **20** adjacent the strip.

The gas is ignited by a pilot burner **30** which is secured to a pilot burner bracket **31** attached to one of the burners in the series. The pilot burner is connected to a gas line **32** and the flame of the pilot light plays upon a thermocouple **33** which is connected to the safety shutoff valve in a conventional manner.

In operation, the gas is admitted through manifold **3** to all of the burners in the series. The pilot light from pilot burner **30** will ignite the gas at the cross lighter located adjacent the pilot burner. The flame will then be propagated endwise across each of the cross lighters in the series and will be directed outwardly from the corrugated strips **28** toward the outlet openings **11** of the respective burners to thereby ignite the gas at each burner outlet **11**.

The cross lighter of the invention is capable of igniting the gas at each burner with a minimum gas input and is fabricated with a standard size to be used with burner units of various outputs. This results in a substantial manufacturing savings in that only a single standard size of cross lighter is fabricated regardless of the number of burners that are employed in a given gas burner unit. As each of the cross lighters is separate and not attached to the adjacent cross lighters, expansion and contraction is minimized and this results in a decrease in the stresses in the metal and also minimizes warpage of the burner unit.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. A cross lighter for a gas burner adapted to be assembled in parallel relation with a plurality of similar burners and said cross lighter disposed in end-to-end relation with the cross lighters of adjacent burners, said burner having

a gas inlet and a gas outlet in the upper portion thereof, comprising an elongated housing having open ends and a generally rectangular cross section, said housing having an upper member and a lower member with each of said members being provided with side flanges, the corresponding side flanges of said upper and lower members being secured together along one side edge of the housing and the corresponding side flanges of said members being spaced apart along the other side edge of the housing to provide a slot therebetween, a series of inwardly extending projections disposed in said lower member, a second series of inwardly extending projections disposed in said upper member and disposed in alignment with said first series of projections of the lower member, means for securing the aligned projections together, a corrugated strip disposed within the slot and engaging said projections, said strip serving to divide the slot into a series of small openings and said projections serving to align said strip within said slot, means defining an opening in said lower member for admitting gas to said housing from the burner, and means for securing the corrugated strip within the slot.

2. In a gas burner having discharge ports, a cross lighter comprising upper and lower channel members facing each other and having corresponding flanges along one side thereof closing the same and remaining corresponding side and end flanges spaced in edge to edge relation to provide a continuous slot serving as a gas discharge port therefor, gas supply means for said cross lighter from the burner, projections extending internally of and inwardly from one of said channel members toward the other and welded thereto to secure said members together, and a baffle strip in the mouth of said slot and positioned against said projections to control the velocity and direction of flow from said slot.

3. The construction of claim 2 in which said gas supply means comprises an opening in the bottom channel member communicating directly with the gas burner ahead of the discharge ports of the burner, and a baffle disposed in the burner to direct gas therefrom into said cross lighter.

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