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Leatherby

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[54] **GAS-FIRED BLAST TYPE BURNER**

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[52] **U.S. Cl.** **431/349,** 239/553.3, 431/328

[51] **Int. Cl.**.....**F23d 13/36**

[58] **Field of Search**.....431/328, 349, 350, 431/353, 329, 180; 239/553.3, 556, 557

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[57] **ABSTRACT**

This invention relates to a gas-fired burner of the blast type, comprising a substantially rectangular unit having a burning grid spaced downwardly of the top of the unit. The top has an inwardly projecting lip with spaced notches to prevent blowout from cross drafts and to create a piloting action. Below the grid is spaced a perforated baffle plate for evenly distributing the gas-fired mixture before reaching the burning grid.

2 Claims, 4 Drawing Figures

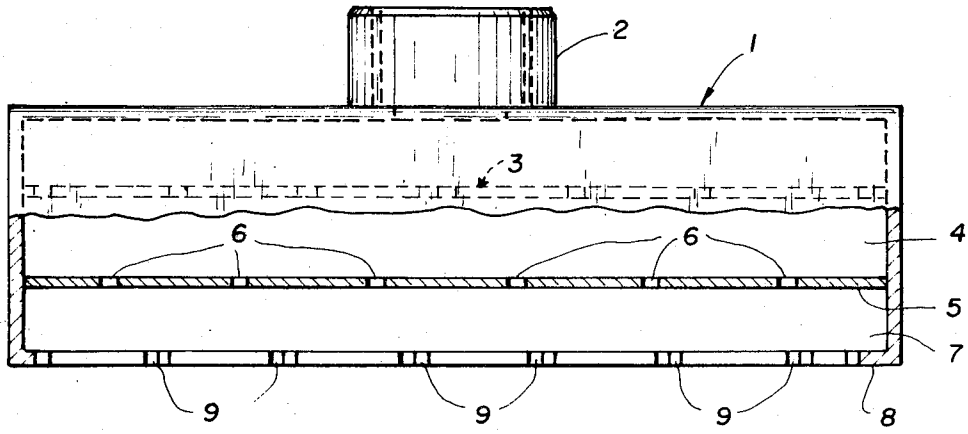


Fig.1.

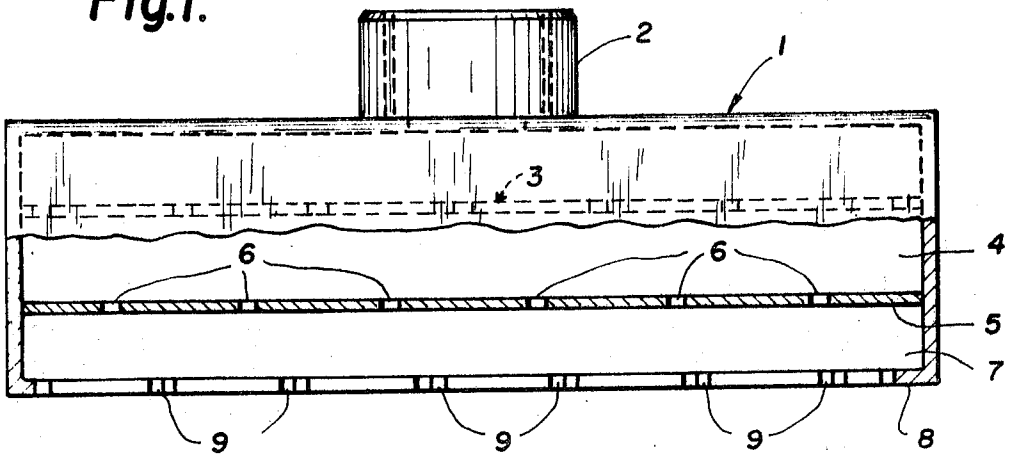


Fig.2.

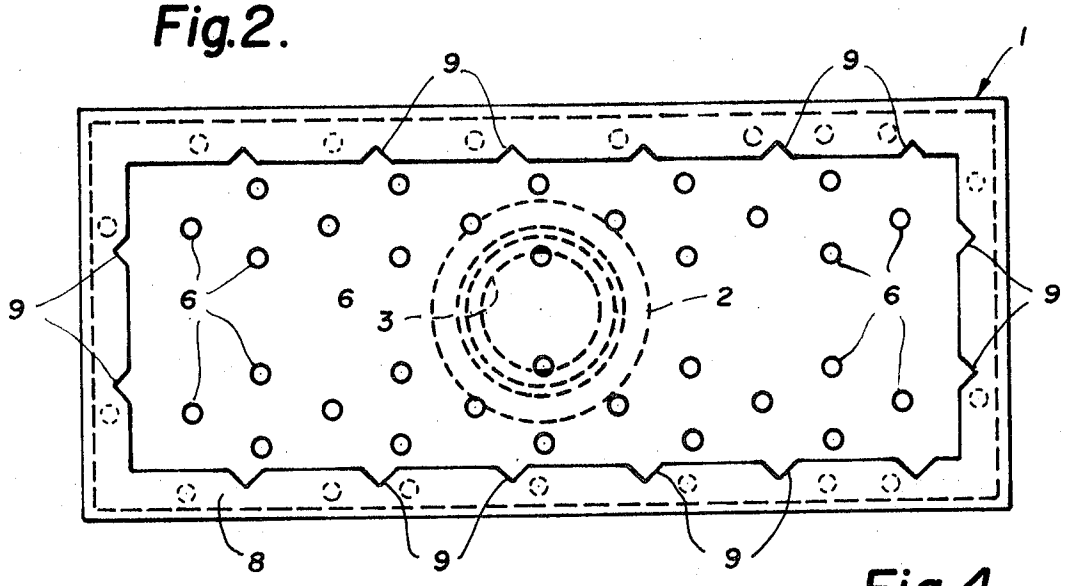


Fig.3.

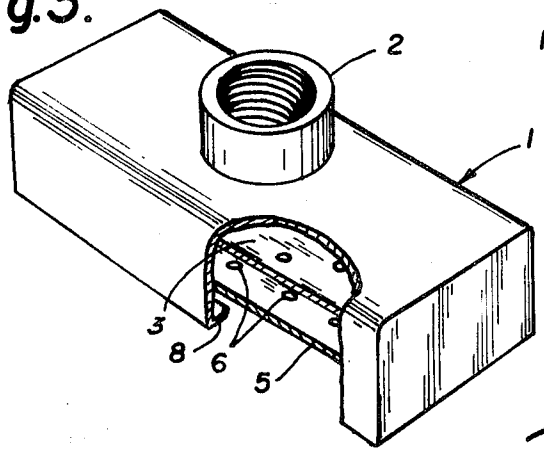
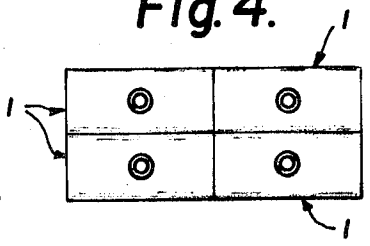


Fig.4.



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GAS-FIRED BLAST TYPE BURNER

This invention relates to a gas-fired, blast type burner for use with a mixture of air pressure and gas (either manufactured, natural or L.P.).

An outstanding disadvantage of commonly used gas-fired blast type burners is that they are generally made circular or of such shape that they cannot be joined together in a compact unit when more than one burner is needed for gang operation.

Another disadvantage has been the tendency for the flame to blowout and the lack of even distribution and sufficiently high heat intensity of the air-gas mixture and lack of an effective and efficient pilot action.

An object of the present invention is to provide a novel gas-fired blast type burner having high heat release and which is devoid of the abovenamed disadvantages.

A more specific object of the present invention is to provide a gas fired blast type burner which is of rectangular outline so that more than one burner can be used in side-by-side or end-to-end relationship to provide gang operation.

Another object of the present invention is to provide a gas fired burner of the blast type including effective means for uniformly distributing gas-air pressure mixture and having an efficient burner grid for providing uniform, high heat release flame, and including means for minimizing or preventing blowout from cross-drafts and the like.

Other objects and advantages will become more apparent from a study of the following description taken with the accompanying drawing wherein:

FIG. 1 is a side view, with a sidewall portion shown broken away, of a gas-fired, high heat release burner embodying the present invention;

FIG. 2 is a top view thereof;

FIG. 3 is a top perspective view thereof with a portion of the wall shown cut-away; and,

FIG. 4 shows a gang operation of four units of the construction shown in FIGS. 1–3.

Referring more particularly to the drawing, numeral 1 generally denotes a rectangular, box-like burner preferably made of heat resistant stainless steel or other suitable heat resistant material and which is provided with an internally threaded, circular fuel inlet 2 at the rear so that a gang assembly of any number of burners can be installed on a pipe manifold, such as the four burners shown in FIG. 4 which are fitted end-to-end and side-by-side in order to create a compact, large, even pattern of heat with high intensity.

The air-gas mixture entering inlet 2 first passes through a baffle plate 3 which is perforated uniformly with relatively large holes so as to distribute the air-gas mixture uniformly in the burner plenum chamber 4. The air-gas mixture then flows through a burning grid or burner face 5 provided with uniformly distributed ports or holes 6 from which flames emerge, which holes are of the order of ⅛ inches in diameter and spaced about ½ inch apart. It will be noted that the burning grid 5 is inset or positioned downwardly about ⅝ inch from the open or top end of the burner.

An inturned lip 8 is disposed about the entire perimeter of the open face of the burner and has spaced notches 9. The lip tends to prevent blowouts of the burning flame and, together with notches 9, creates a piloting action that assures continuous ignition of the

burner. For best results the notches 9 should be slightly offset from the perimetrical burner openings 6 immediately underneath lip 8. Lip 8 has notches 9 of a size and spacing such as to release a portion of fuel from the side openings so that the flame coming off the lip will be the same size and intensity as the main flame. By properly locating the port openings 6 on the burner grid it is possible to spread the heat pattern to the full size of the burner face. The notched lip 9 also creates turbulence and relieves build-up of temperature.

The burner provides high heat release with little or no tendency for blowout and is useful for fire polishing of openings on glass containers and many other heating applications. At 6 inch W.P. the burner has the capacity of about 100,000 BTU/hour and has a wide range of turn down. The unique design of the port openings on the burner face allows operation with a variety of air-gas mixture ratios with excellent flame retention. The normal operation with full air-gas mixture produces a block flame pattern of about 6 ½ inch by 2 ½ inch with the flame about 2 ½ inch long.

The burner is suitable for operation in areas up to about 1000°F. and more than one burner may be installed on a pipe manifold and butted together as shown in FIG. 4 to produce a solid and enlarged heat pattern.

While the sidewalls of holes 6 are shown as being vertical in FIG. 1, they may be tapered downwardly and outwardly up to 20° from the vertical to allow the flame to spread, which will improve the ignition rate and give a better heat distribution pattern. Also the plate 5 may be a separate piece from the box if it is desired to use a special heat resistant metal or ceramic material for the burning grid.

Thus it will be seen that I have provided an efficient gas-fired, high heat release burner of the blast type which functions from an air/gas mixture of sufficient pressure to develop a blast-like flame. The burner is designed for compact gang operation. The burner provides very substantial improvement, both in efficiency and operation, over burner units that are commonly used at present.

The design of the burner face makes it possible to maintain good flame retention without the use of any baffles or exterior pilots. It will operate continuously in the open without a target wall.

The port openings are sized and located so that an even heat pattern will develop. The high intensity heat release is ideal for jobs that require a quick high temperature operation.

The burner face or burning grid is recessed below a tapered side wall. This design protects the burner from blowing away due to cross drafts or high mixture pressures and it develops a continuous line of ignition. The serrated edge on the side wall or lip is designed correctly to release the excess heat thus eliminating a build-up of temperatures and thereby being able to hold an even release of heat.

An ideal application of the invention is to fire downward in order to fire polish glass bottle tops as they are placed on a conveyor prior to moving into a lehr. These burners can be arranged to cover areas that require stress relieving after welding or to preheat an area on a steel plate prior to forming or shearing.

While I have illustrated and described a single specific embodiment of my invention, it will be understood that this is by way of illustration only and that changes

and modifications may be contemplated within the scope of the following claims.

1. A gas-fired burner of the blast type comprising a substantially rectangular metallic housing having a circular inlet opening on one closed side and having an inturned metallic lip extending from the rectangular margin of the opposite open side, a perforated metallic baffle plate with relatively large holes spaced from said inlet opening to distribute the air-gas mixture uniformly in the burner plenum chamber, and a burning metallic grid contained in said housing and spaced from said baffle plate, said burning metallic grid having substantially uniformly distributed, relatively large ports of a size of the order of ⅛ inch diameter spaced about ½ inch apart, some of which are under said lip, for burning fuel, said lip having a plurality of spaced notches on the inward edge thereof which are slightly offset from said ports, located in spaced relationship under said lip to relieve build-up of temperature, prevent blowouts of the burning flame and to create a piloting action to assure continuous ignition of the burner.

2. A plurality of gas-fired burners of the construction recited in claim 1 in adjoining relationship so as to enable them to be fed by a pipe manifold in gang operation.

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