Nov. 21, 1933. J. S. FULLER 1,935,705

LOW PRESSURE GAS BURNER

Original Filed Sept. 30, 1929 2 Sheets-Sheet 1

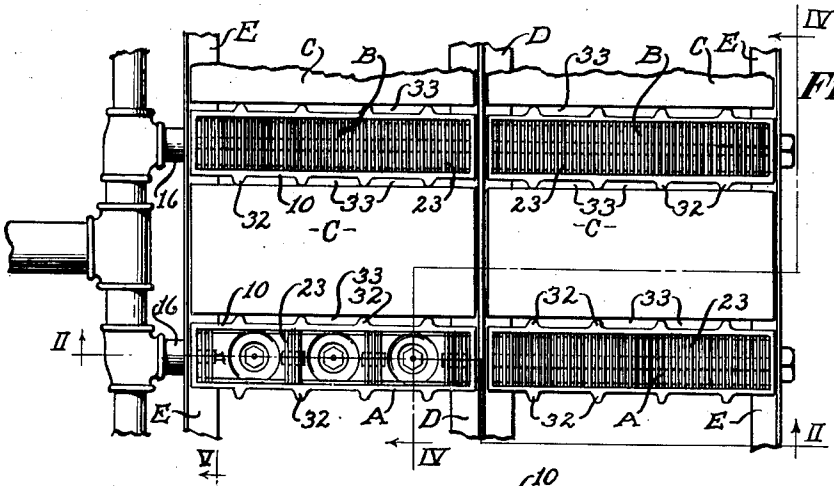


FIG. 1

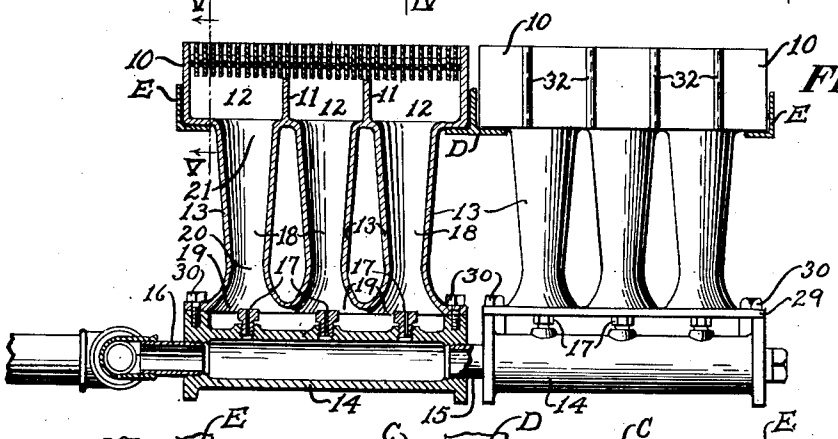


FIG. 2

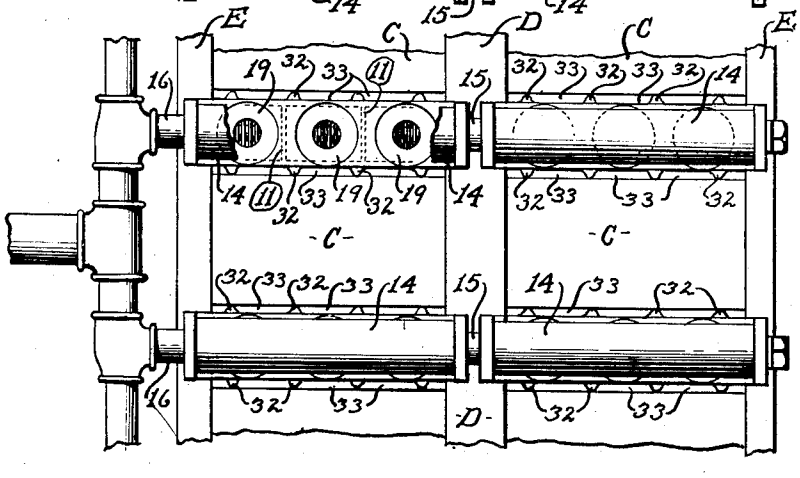


FIG. 3

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LOW PRESSURE GAS BURNER

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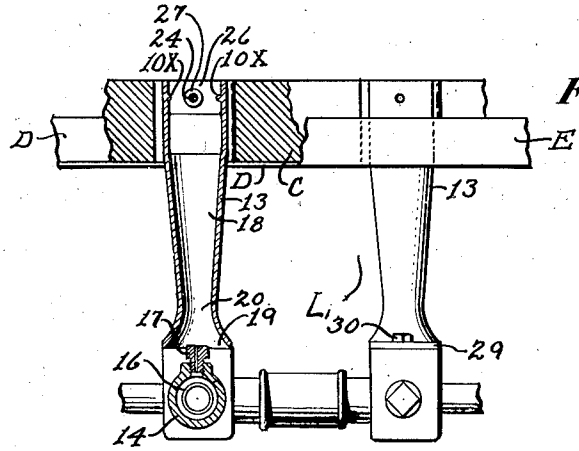


FIG. 4

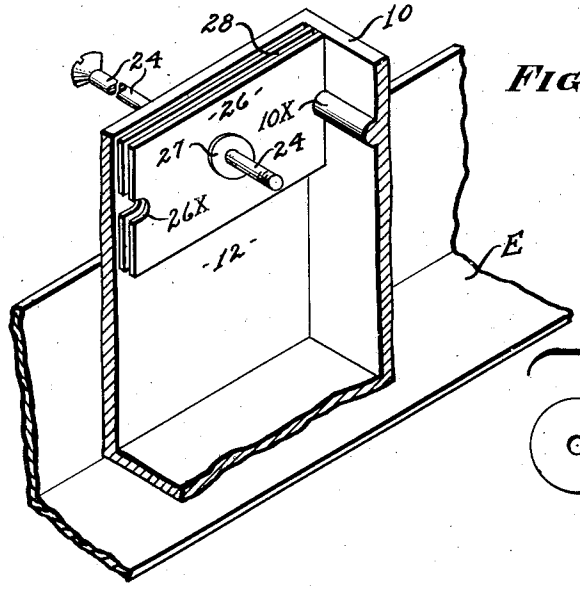


FIG. 5

FIG. 6

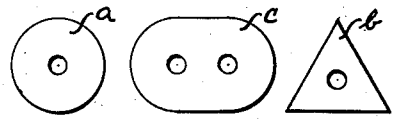
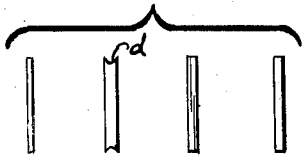


FIG. 7



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LOW PRESSURE GAS BURNER

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Application September 30, 1929, Serial No. 396,065. Renewed April 19, 1933

5 Claims. (Cl. 158—104)

This invention relates to gas burners, and has for an object the provision of a low pressure burner which is light in weight; noiseless in operation; may be easily installed; is durable in construction, and of a relatively large capacity.

One of the principal objects of the invention is to provide a burner with efficient and economical means including a burning edge arrangement for eliminating popping or backfeeding or lighting on the manifold when the burner is turned low, the means employed embodying a burner element of novel construction which includes a plurality of elongated narrow openings. These openings are of a shape and capacity to insure a proper gas barrier and prevent the flame from passing through these openings into the burner body.

Another object of the invention is the provision of a burner in which the various parts may be renewed when desired, the manner of assembling the burner being such that it may be readily taken apart and reassembled.

Another object is to provide a burner having composite sections, any one of which might be disabled without interfering with the function of the composite section adjacent to it.

Another object of the invention is the provision of a burner which is constructed so that a number of burner units may be connected and installed to provide a burner of any desired capacity.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings;

Fig. 1 is a plan view showing four burner units.

Fig. 2 is a side view of Fig. 1, taken along the line II—II in Fig. 1.

Fig. 3 is a bottom view of Fig. 1.

Fig. 4 is a view taken along line IV—IV in Fig. 1.

Fig. 5 is an enlarged detail view taken along line V—V in Fig. 2.

Fig. 6 is a view showing a number of different shaped disks which may be used in the construction of the burner element.

Fig. 7 is an edge view of the disks.

Referring to the drawings in detail wherein like characters of reference denote corresponding parts, the burner is shown in Figs. 1 and 2 arranged in connected units, these units being indicated at A. Each unit comprises a burner proper B which is positioned between fire bricks or other fire resisting element C, the opposite ends of the burners and fire bricks resting upon the flanges of T beams D, and angle irons E.

Each burner B includes a hollow body 10 which is provided with divisions 11, forming compartments 12. On the opposite sides of member 10, are transverse rib like members 10*x*, and depending from each of the compartments 12 is a Venturi tube 13, which is integral with the member 10 and these tubes 13 are joined together at the bottom portion as shown in Fig. 2.

Arranged beneath the depending portion 13 of the body 10 is a gas header 14 through which gas is supplied to the burner and where more than one burner unit A is employed, the headers 14 are connected by a pipe 15 while gas may be supplied to the headers through a pipe 16 from any suitable source.

The Venturi tubes 13 and compartments 12 define a mixing chamber, air being admitted to this chamber through the open bottom of tubes 13 while gas is supplied through nipples 17 which extend from the header 14. The mixing chamber is divided into a plurality of Venturi passages 18 which include relatively wide entrances 19, and restricted throats 20 and flared outlet ends 21, each of the latter communicating with its chamber 12 in the interior of the hollow body 10. The burner must have a large volume of primary air mixed with the gas. In order to secure this I employ Venturi tubes of careful design. These Venturi passages thus serve to admit a quantity of gas and air, the same being mixed and slightly compressed in its passage through the throat 20 and expanding into a distributing chamber 12 located within the hollow body 10. My burner thus has a very explosive mixture within its tubes.

Located within the top of the mixing chamber is a burner element 23. This element includes a rod 24 whose opposite ends are received within holes provided in the end walls of the distributing chamber. Mounted upon this rod are rectangular plates 26 which are spaced apart by relatively small disks 27. The rectangular plates 26 are arranged transversely of the top of the distributing chamber and are of a width to have their edges contact with the opposite sides of this chamber so that relatively narrow elongated burner openings 28 are provided. These plates 26 are provided with notches 26*x* to receive the ribs 10*x* which act as a stabilizing feature of plates 26. The openings 28 extend transversely of the distributing chamber upon opposite sides of the longitudinal center of the latter and the

shape and capacity of these openings is such as to prevent objectionable popping of the burner, and will also prevent the flame from traveling inward. Flame has a curvature up stream and must be snuffed out before passing completely through the burning edge or it will flash into the mixing chamber of the burner. I have discovered that deep narrow slots 28 will avoid this, whereas shallow slots will prove very ineffective. In my burner the velocity of the gas is increased as it passes through the two narrow passage spaces, Fig. 5, included between the edge of the washer 27 and the paired ribs 10x. Since the passage widens again higher up, the velocity decreases and the flame does not blow off the top or roar. My plates are not fastened at their ends and can shift and expand horizontally between the ribs 10x. The ribs 10x and vertical ribs 32 reinforce the box and prevent warping.

The space 28 should be varied for different gases and in my improved burner this is accomplished by employing washers 27 of varied thickness. This opportunity of adjustment in assemblage is of great importance.

Extending laterally from the Venturi tubes are portions 29, provided with a hole to receive a bolt 30, said bolt extending into the ends of the gas header 14, thereby rigidly attaching the gas header 14, to the Venturi tubes 13 and centering the gas jets 17 with the throats 20 of the Venturi tubes 13.

As previously stated, a mixture of air and gas enters the distributing chamber 12 through the Venturi passages 18 and from there passes through the openings 28 between the plates 26, where combustion takes place.

Ribs 32 extend from opposite sides of the body 10 and contact with the adjacent walls of the fire brick or other fireproof members C and provide secondary air passages 33.

Various shapes and sizes of plates and disks may be utilized in constructing the burner element, some of which are shown in Figs. 6 and 7 of the drawings. As shown at a in Fig. 6, the disks may be circular, or they may be triangular as shown at b. Also, they may be elongated as shown at c and provided with spaced openings so that more than one rod 24 may be used. The edges of the disks may be flat and of varying widths as shown in Fig. 7, or they may be concaved as shown at d in this figure.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention what is claimed is:

1. In a gas burner, a plurality of burner bodies spaced apart; each burner body being open at the top and having divisions therein, defining fuel distributing chambers and a Venturi tube for each chamber, said Venturi tubes being open at their bottoms, and having their tops communicating with their respective distributing chambers; a gas header for each burner body below and rigidly affixed to said Venturi tubes and arranged to supply gas for mixture with air entering said Venturi tubes, and a plurality of gas jets in said gas header, each jet being located in the central axis of its respective Venturi tube; a burner element located within the top of the burner body above the chambers and having spaced openings therein; spaced ribs on the exterior of the burner body; and means supporting adjacent burner bodies; and a fire resisting element also supported by said means, arranged intermediate and in contact with the ribs of adjacent burner bodies.

2. In a gas burner as defined in claim 1; and auxiliary air passages defined by the side faces of said gas burner bodies, their ribs and the side contacting faces of the fire resisting element.

3. In a burner, a hollow burner body having divisions therein defining fuel distributing compartments, each compartment having a transverse rib element on opposite sides thereof, a rod arranged intermediate said ribs, a plurality of rectangular plates at spaced intervals apart defined by washers sleeved on said rod in an alternating series; said plates being arranged transversely at the top of the distributing chamber, their opposite ends being notched to receive said transverse ribs as a stabilizing means and for forming a pair of restricted passages on opposite sides of each washer and between adjacent plates; a Venturi tube below each compartment in communication therewith at the base thereof; a gas header supplied with nipples, one for each tube and communicating therewith.

4. In a burner as described in claim 3; characterized by the further fact that said burner body has a plurality of spaced vertical ribs on the exterior thereof.

5. In a gas burner; a plurality of burner bodies of the character defined in claim 3, spaced apart, and means for supporting adjacent burner bodies; and a fire resisting element also supported by said means arranged intermediate and in contact with vertical ribs on said burner bodies.

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