Oct. 21, 1930. R. THURM 1,778,839

GAS BURNER

Original Filed Oct. 15, 1925

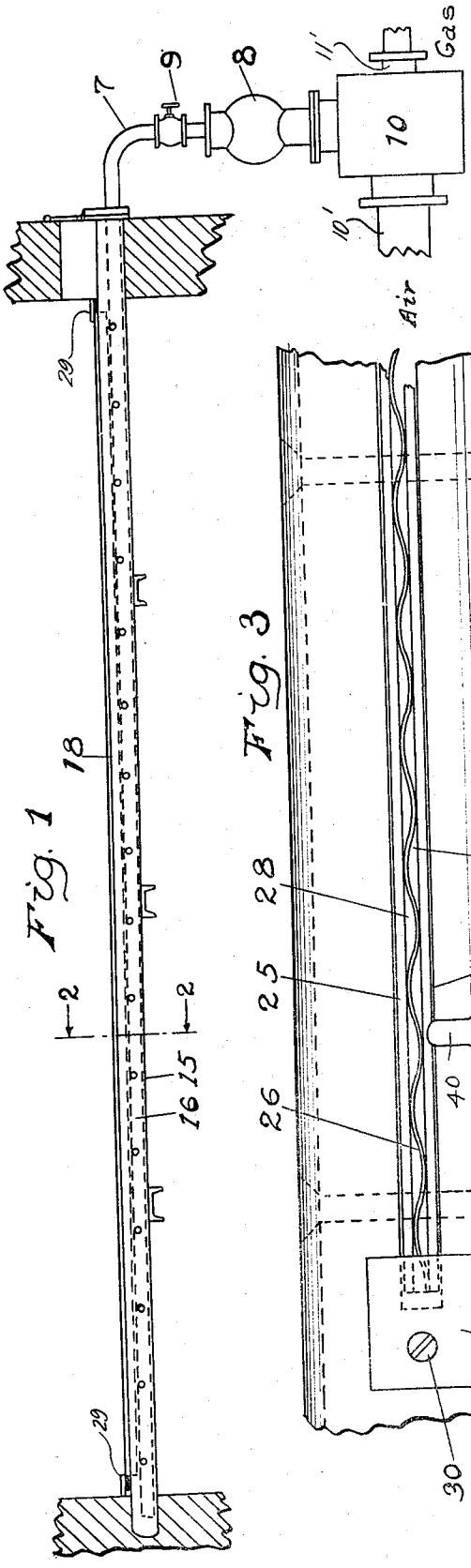


Fig. 1

Fig. 3

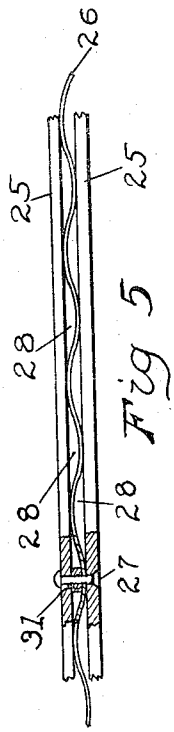


Fig 5

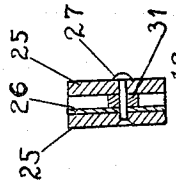


Fig. 4

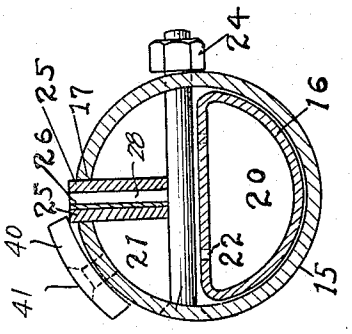


Fig 2

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UNITED STATES PATENT OFFICE

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GAS BURNER

Original application filed October 15, 1925, Serial No. 62,511. Divided and this application filed January 31, 1928. Serial No. 250,848.

The present invention relates to burners for illuminating gas, producer gas, water gas, vaporized oils and similar fuels and particularly to the long tubular burners employed for burning mixtures of gaseous fuels and air in substantially oxygen-free atmospheres as, for example, in baking ovens. When the ordinarily long tubular burner supplied with a combustible mixture of air and gaseous fuel is employed in a more or less confined space and in an atmosphere that is substantially free from or at least deficient in oxygen and raised to a high temperature the combustion of the fuel at the outlet points of the burner is not dependable and there is liability to objectionable and somewhat dangerous backfiring and explosions.

An object of the present invention is to provide a burner of the above mentioned type so constructed as to prevent such backfiring and explosions and to insure a continuous and substantially uniform combustion throughout the length of the burner.

With these and other objects in view, the invention comprises the novel and improved features, constructions and combination of parts hereinafter described, and particularly pointed out in the claims, the advantages of which will be clearly understood and appreciated by those skilled in the art.

As to common patentable subject matter this application is a divisional application based upon certain subject matter contained in my prior application, Serial No. 62,511, filed October 15, 1925.

The invention will be clearly understood from the accompanying drawings illustrating the invention in its preferred form and the following description of the construction therein shown.

In the drawings—

Figure 1 is a view in side elevation of a burner embodying parts of a baking oven which aid in supporting the burner shown in section;

Figure 2 is a sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a fragmentary top plan view of the burner on an enlarged scale;

Figure 4 is a detailed sectional view of a portion of the burner; and

Figure 5 is a view partly in plan and partly in horizontal section of the portion of the burner shown in Figure 4.

In the present embodiment of the invention the burner includes a suitable fuel chamber to which fuel is supplied from a conduit which preferably extends substantially throughout the length of the burner. Fuel in the form of properly mixed gas and air is supplied to the conduit by a suitable mixing device with which it is connected and which in turn is supplied with gas and air in the proper proportions. From the fuel chamber the fuel is discharged and is burned at the point of discharge.

In the illustrated embodiment the burner includes a tubular member preferably circular in cross-sectional form and is provided with an elongated slot or opening which extends longitudinally thereof. In this slot or opening is positioned the means which controls the discharge of fuel from the fuel chamber and this preferably comprises a unitary structure which is capable of bodily replacement and removal with relation to the said elongated slot or opening.

The tubular member heretofore referred to is designated by the reference numeral 15, the elongated slot or opening being designated by the reference numeral 17 and as stated, extends longitudinally of the burner.

The fuel is supplied to the burner by means of a pipe 7 which is connected with a main supply 8. This main supply 8 is in turn connected with a suitable air and gas mixing device 10 to which air may be supplied by means of a conduit 10′, the gas being supplied by means of a suitable conduit 11′ as indicated in Figure 1. A suitable controlling means in the form of a valve may be employed to regulate the volume of fuel supplied to the pipe 7 from the fuel main 8.

This pipe 7 has communication with a tubular member 16 forming a chamber 20 preferably semi-circular in cross-sectional shape, which tubular member 16 is positioned within the tubular member 15 here-

tofore mentioned, thus forming a chamber 21 as shown in Figure 2, and one of the walls, preferably the upper wall, of this tubular member 16 is provided with a plurality of perforations 22 preferably arranged in staggered relation, through which the fuel is discharged from the member 16 into the interior of the tubular member 15. By this construction a uniform pressure of fuel is maintained in the chamber 21.

The means for controlling the passage of fuel through the elongated slot or opening 17 in the present embodiment of the invention consists of two relatively long narrow metallic plates so arranged as to engage the side edges of the slot when the device is positioned therein. These plates are each designated by the reference numeral 25 in the drawings and interposed therebetween is material forming with the walls a series of gas passages through each of which the gas travels a distance considerably greater than the transverse dimension of the passage. In the present embodiment of my invention,—shown in the drawings merely as one illustrative form,—this gas passage forming interposed material is a transversely corrugated plate or strip 26. This transversely corrugated strip 26 is of substantially the same length and width as the plates 25 but may be relatively thinner than said plates, as shown. The transversely corrugated strip 26 maintains the plates 25 in spaced relation and divides the space between said plates into a plurality of passages 28 which extend radially of the burner when the several parts thereof are assembled.

For the purpose of making a unitary structure of the plates 25 and the corrugated strip or plate 26 suitable fastening means are employed which, in the present instance, are in the form of rivets 27 which extend through the plates 25 and the corrugated strip or plate 26 at a point removed from the side edges thereof, as illustrated in Figure 4. In order to prevent a flattening of the corrugated strip under the pressure or force exerted by the fastening means or rivets 27, elements such as the washers 31 are positioned between one of the plates 25 and the corrugated strip and are held in such position by the rivets or fastening means 27. These blocks or washers limit the movement of the plates 25 in a direction toward each other and consequently determine the minimum size of the passages 28 by preventing a flattening of the corrugated strip 26 when the device is assembled.

The unitary structure thus formed is positioned in the elongated slot or opening of the burner and is retained therein by a suitable means such, for example, as the end plates 29 which overlie the ends of the plates 25 and 26 respectively and which are secured to the burner by suitable fastening means, such as indicated at 30. These end plates 29 are so formed as to fit tightly the tubular member 15 and prevent any escape of fuel at the ends of the slot. In addition to these end fastening means, fastening means such as the overlying clips designated by the reference character 40 which engage one of the plates 25 may be employed. These plates 40 are secured to the burner by suitable fastening means 41, as shown in Figure 3.

As indicated by dotted lines in Figure 3, the strips or plates 25 and 26 are slightly shorter than the elongated slot or opening 17 in the burner, which construction allows for the free expansion and contraction under the influences of the heat of the burner without injury to any of the elements of the burner.

While I have described a preferred embodiment of my invention, the invention may be embodied in widely different forms other than shown and I therefore do not limit myself to the particular construction illustrated and described herein.

What is claimed as new is:

1. A burner comprising a tubular member having a slot therein, and a channeled structure mounted in said slot and dividing it into a plurality of individual fuel passages, said channeled structure comprising a plurality of relatively long plates of greater width than thickness, a transversely corrugated strip interposed between said plates, and means for securing said plates together.

2. A burner comprising a tubular member having a slot therein, and a channeled structure mounted in said slot and dividing it into a plurality of individual fuel passages, said channeled structure comprising a plurality of plates, a transversely corrugated strip interposed between said plates, means for maintaining said plates in definite spaced relation, and means for securing the elements of said channeled structure rigidly together.

3. A burner comprising a tubular member having a channeled structure divided into a plurality of individual fuel passages, said channeled structure comprising a plurality of plates, a transversely corrugated strip interposed between said plates, and means for maintaining said plates in definite spaced relation.

4. A burner comprising a tubular member having a slot therein, and a channeled structure mounted in said slot and dividing it into a plurality of individual fuel passages, said channeled structure comprising a plurality of plates, a transversely corrugated strip interposed between said plates, means for securing the elements of said channeled structure rigidly together, and spacing blocks interposed between one of said plates and the corrugated strip for maintaining the plates

and strip in definite spaced relation and preventing distortion of the strip.

5. A burner comprising a tubular member having a slot therein, and a channeled structure mounted in said slot and dividing it into a plurality of individual fuel passages, said channeled structure comprising a plurality of relatively long plates of greater width than thickness, a transversely corrugated strip of a width substantially the same as that of the plates and interposed therebetween and means for securing said plates together.

6. A burner comprising a tubular member having a slot therein, and a channeled structure mounted in said slot and dividing it into a plurality of individual fuel passages, said channeled structure comprising a plurality of relatively long plates of greater width than thickness, a transversely corrugated strip interposed between said plates, means for securing said plates together, and means carried by the tubular member and overlying the channeled structure for retaining said channeled structure in said slot.

7. A gas burner comprising a gas conduit having a slot therein, walls extending through the slot and into the conduit but independent thereof, said walls extending longitudinally of the slot and being spaced apart less than their width, and means between said walls forming therewith a series of gas passages through which the issuing gas travels a distance greater than that between said walls.

8. A gas burner comprising a gas conduit having a slot therein, walls extending through the lot and into the conduit but independent thereof, said walls extending longitudinally of the slot and also outside of the conduit, and being spaced apart less than their width, and means between said walls forming a series of gas passages through which the issuing gas travels a distance greater than that between said walls.

9. A gas burner comprising a gas conduit having a slot therein, a gas passage unit mounted in said slot and comprising walls extending longitudinally thereof and spaced apart a distance less than their width, means between said walls forming a series of restricted gas passages along said slot, said gas passage unit being bodily placeable in and removable from the slot.

Signed at Saginaw, Michigan, this 26th day of January, 1928.

RICHARD THURM.