

Aug. 28, 1934.

P. M. FORSTER

1,971,554

GAS BURNER

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Fig. 1.

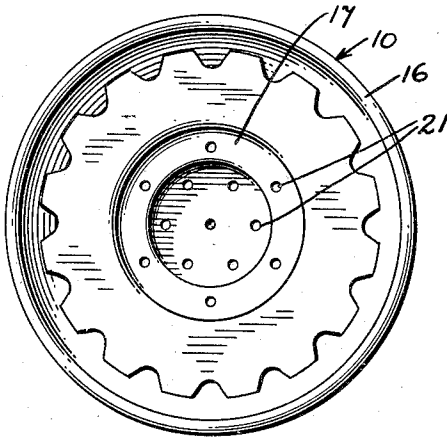


Fig. 3.

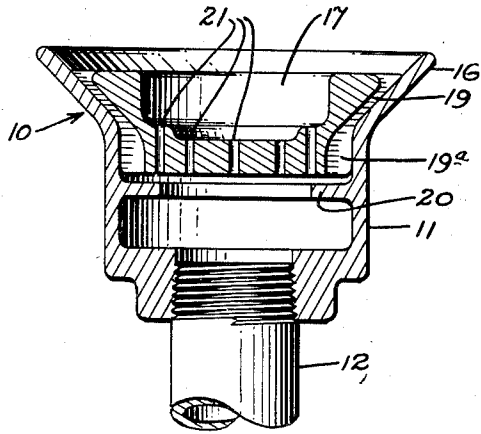


Fig. 2.

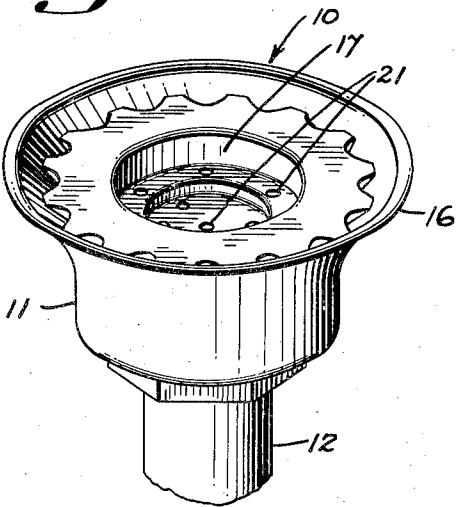
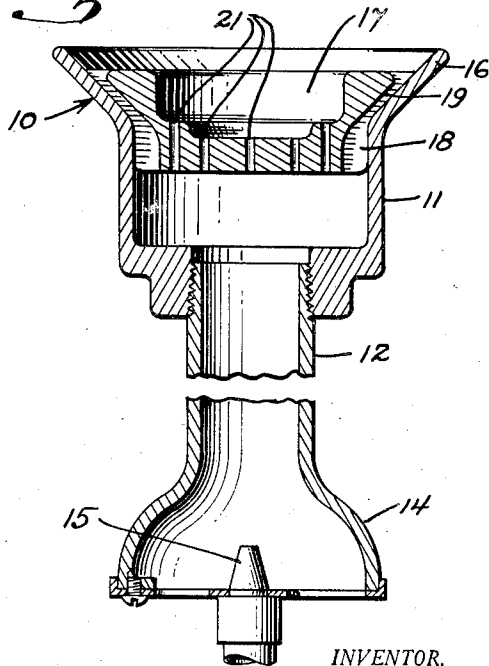


Fig. 4.



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UNITED STATES PATENT OFFICE

1,971,554

GAS BURNER

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Application August 29, 1932, Serial No. 630,900

2 Claims. (Cl. 158—116)

This invention relates to gas burners for boilers and the like.

It is the principal object of the present invention to provide a generally improved burner utilizing natural or manufactured gas as a fuel, which burner is so constructed that the flame is distributed over a maximum area in a formation obtaining maximum efficiency in boilers and the like.

In practicing the invention a burner is provided which includes a hollow body to which the gas and air are delivered. This body is provided with a nozzle structure which distributes the flame coaxially thereof and in a frusto-conical shape thereabout, so that the flame is distributed in a manner and in a formation obtaining maximum heating efficiency in boilers and the like.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawing, in which:

Fig. 1 is an end view of the burner.

Fig. 2 is a perspective view of the burner.

Fig. 3 is a central longitudinal sectional view through the burner for use in connection with gas under high pressure.

Fig. 4 is a similar view of the burner constructed for use in connection with gas under low pressure.

Referring more particularly to the accompanying drawing, 10 indicates a burner comprising a hollow body 11, one end of which is connected with a tube 12. The other end of this tube 12 is provided with a venturi 14 centrally into which a fuel nozzle 15 projects. By this medium fuel and air are propelled through the tube 12 into the hollow body 11.

The end of the hollow body 11 opposite the junction between it and the tube 12 is provided with a frusto-conical portion 16. This end of the hollow body is open. Fitting within this frusto-conical end of the hollow body 11 is a nozzle member 17 which has an external contour coinciding with the internal contour of the outer end of the hollow body 11, so that it will nest therein as illustrated. It will be noticed that the external contour of this member 17 has a straight portion 18 fitting within the straight portion of the hollow body member 11 and a frusto-conical portion 19 fitting the frusto-conical portion 16 of the body 11.

It will be noticed that there are a series of longitudinal grooves formed in the outer surface or periphery of the member 17, so that gas and air entering the inner end of the body 11 will be

directed outwardly through these grooves so that a frusto-conical flame will be produced at the outer end of the nozzle.

In Fig. 3 it will be noticed that there is a flange 20 formed around the interior diameter of the body 11 just below the grooves 19a in the nozzle member 17. The provision of this flange restricts the flow of gas to the grooves 19a in order that the rate of gas discharge through the grooves 19a will not exceed the rate of flame propagation. This flange 20 is used when gas under high pressure is employed. However, when gas is under low pressure, this flange may be dispensed with as illustrated in Fig. 4.

In order to provide a central flame from the burner, the central portion of the burner is formed with a plurality of co-axially restricted openings 21 which are arranged in geometrical fashion about the center of the member 17. It will be noticed that the outer face of the member 17 is recessed about these openings for the purpose of directing the flame. This, however, is unnecessary and may be dispensed with if desired.

In operation of the device, it is constructed and assembled as shown in the drawing and gas and air are delivered to the interior of the body 11. This gas seeks to escape not only through the restricted orifices 21 in the center of the nozzle member 17 but through the grooves constituting orifices at the periphery of the nozzle member 17. As these orifices are arranged with diverging axes, a frusto-conical flame will be produced surrounding the centermost flame produced by the gas and air passing through the orifices 21.

If high pressure gas is used, a baffle or flange such as indicated at 20 in Fig. 3 is utilized to restrict the flow of gas to the orifices in order that the rate of gas flow through these orifices will not exceed the rate of flame propagation. However, if low pressure gas is used, this flange may be dispensed with.

I have found that by constructing a burner as illustrated and described herein that the flame is so disposed that a maximum efficiency is obtained in the boiler.

It should also be pointed out that the structure here disclosed is simple in construction and inexpensive to manufacture and while I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I

claim and desire to secure by Letters Patent is:

1. A burner of the character described comprising a hollow body member having an imperforate cylindrical section, the inner end of which
 5 is formed with a central opening to which a venturi may be connected to deliver gas and air to the interior of the body member, the other end of the body member being open, an open-ended frusto-conical section at the latter end of the
 10 body member formed integral therewith and constituting an extension thereof, a nozzle member having a frusto-conical outer end conforming to and fitting the interior of the frusto-conical section of the body member whereby it will nest
 15 therein with its outer end spaced inwardly from the outer end of said frusto-conical section of the body member, the nozzle member also having a cylindrical portion formed integral with the frusto-conical portion and projecting into the
 20 cylindrical section of the body member and conforming in contour with and fitting the interior of said cylindrical portion of the body member, the inner end of said nozzle member being spaced from the inner end of the body member, the
 25 perimeter of said nozzle member being formed with a plurality of spaced longitudinal grooves extending from end to end of the nozzle member and constituting gas passageways between the exterior surface of the nozzle member and the interior
 30 surface of the body member, said nozzle member having a plurality of longitudinally arranged openings formed through the same, arranged in concentric circles about the center thereof, said openings being restricted with respect to said passageways at the exterior of the
 35 nozzle member.

2. A burner of the character described comprising a hollow body member having an imperforate cylindrical section, the inner end of which is

formed with a central opening to which a venturi may be connected to deliver gas and air to the interior of the body member, the other end of the body member being open, an open-ended frusto-conical section at the latter end of the body member formed integral therewith and constituting an extension thereof, a nozzle member having a frusto-conical outer end conforming to and fitting the interior of the frusto-conical section of the body member whereby it will nest therein with its outer end spaced inwardly from the outer end of said frusto-conical section of the body member, the nozzle member also having a cylindrical portion formed integral with the frusto-conical portion and projecting into the cylindrical section of the body member and conforming in contour with and fitting the interior of said cylindrical portion of the body member, the inner end of said nozzle member being spaced from the inner end of the body member, the perimeter of said nozzle member being formed with a plurality of spaced longitudinal grooves extending from end to end of the nozzle member and constituting gas passageways between the exterior surface of the nozzle member and the interior surface of the body member, said nozzle member having a plurality of longitudinally-arranged openings formed through the same, arranged in concentric circles about the center thereof, said openings being restricted with respect to said passageways at the exterior of the nozzle member, a flange formed around the interior of the cylindrical portion of the body member and integral therewith and spaced a distance below the inner end of the nozzle member and also spaced a distance above the inner end of the cylindrical portion of the body member.

PERCY M. FORSTER.

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