March 6, 1934. C. CONE 1,950,046

GAS BURNER

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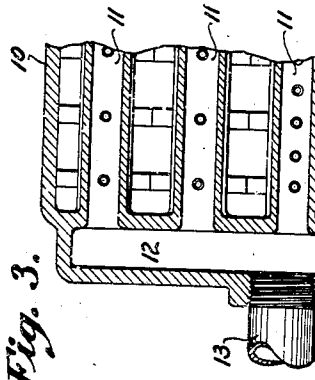


Fig. 3.

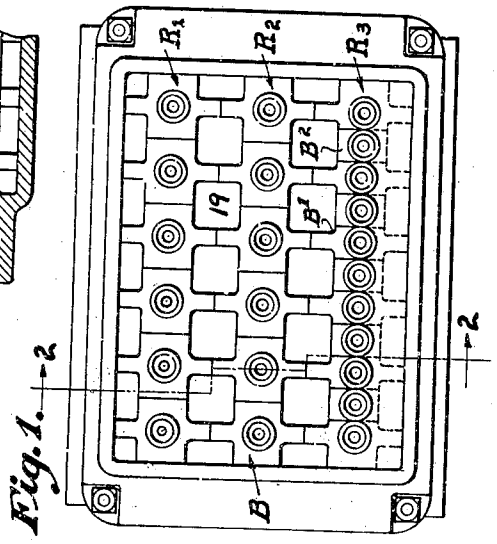


Fig. 1.

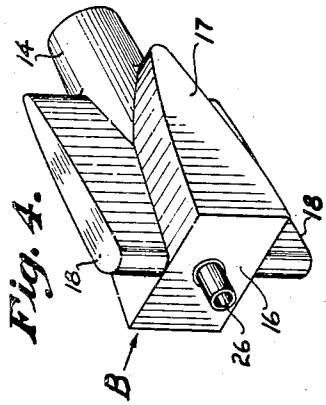


Fig. 4.

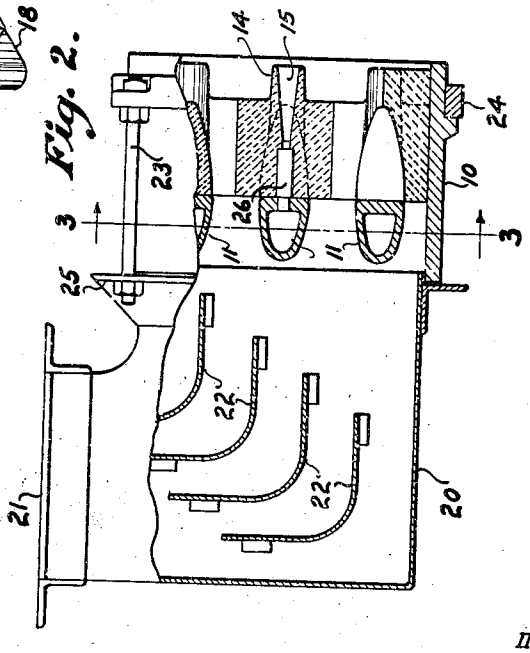


Fig. 2.

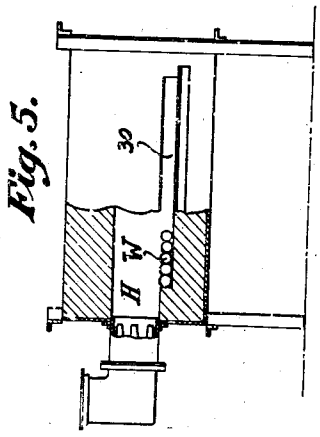


Fig. 5.

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Application May 12, 1933, Serial No. 670,763

6 Claims. (Cl. 158—104)

This invention has for its object to provide a gas burner of such form and construction that there may be associated with and supported by an air conduit a plurality of gas nozzles which divide the conduit into a plurality of passages through which air from the conduit must flow to support combustion of the gas and withal to provide a burner which shall be simple in construction and otherwise well adapted for its intended purpose.

The various features of novelty and invention will fully appear from the detailed description taken in connection with the accompanying drawing forming part of the specification and wherein—

Fig. 1 is a front elevation of the improved burner;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary section on line 3—3 of Fig. 2;

Fig. 4 is a perspective view of one of the tile blocks utilized in the burner construction and,

Fig. 5 is a view showing how the improved burner is applied to a furnace adapted for the heating of rods and the like.

In the drawing, 10 indicates a rectangular open-ended conduit or casing of substantial cross-sectional area. Extending through this casing in spaced parallel relation are a plurality of gas conduit 11, three of such conduits being shown. These conduits open at one end to a gas manifold 12 to which gas is supplied by pipe 13. Associated with each conduit 11 and extending lengthwise of same is a row of refractory blocks arranged side by side in abutting relation, each block being ported to form a nozzle, the nozzles being arranged in parallel relation. For convenience of description the upper row will be identified by reference character R1, the next row by R2, and the bottom row by R3. The blocks making up rows R1 and R2 are generally indicated at B, one of such blocks being shown in Fig. 4.

Each of the blocks B comprises a portion which is cruciform in cross-section and a projecting nozzle portion 14 which is circular in cross-section, the nozzle passage being indicated at 15 and extending longitudinally through the block. The end wall 16 of the block opposite the nozzle 14 is preferably flat and is adapted to abut against the conduit 11. The side walls 17 of the block are in parallelism and are preferably flat. When the blocks are arranged side by side as in Fig. 1, the walls 17 are in abutting relation. As clearly shown in Fig. 4, the side walls 17 gradually decrease in height from the end wall 16 toward the nozzle end of the block. Projecting laterally in opposite direction from the main body of the block are wall members 18 which preferably decrease in width from the end wall 16 toward the nozzle 14. In general it may be stated that the block is so constructed as regards its outer surfaces as to permit air to flow past the block in streamline flow.

When the blocks are assembled in rows, the walls 18 serve to divide the otherwise open space between adjacent rows into a plurality of individual passages 19. While it is preferred the walls 18 constitute a part of the blocks B nevertheless insofar as the formation of the individual passages 19 are concerned the same result may be obtained by interposing separate partition walls as will be readily appreciated. The air is supplied to the burner under relatively low pressure by a chamber 20 having an inlet 21 adapted for connection to an air supply conduit not shown.

The chamber 20 is desirably provided with a plurality of spaced walls 22 so arranged as to cause the air to flow straight forwardly towards the burner and is preferably removably secured to the casing 10 in any suitable manner as by bolts 23 which cooperate with a ring 24 around one end of the casing 10 and a flange 25 on the chamber 20.

Inserted in each passage 15 and projecting therefrom is a short tube 26, the projecting end of which is received within an aperture in the conduit 11 as will be readily understood by reference to Fig. 2. These tubes 26 serve to anchor the respective blocks to their conduits. The blocks B in rows R1 and R2 are duplicates and the row R3 may be made up of the same kind of blocks. However, as shown in Fig. 1, the gas nozzles in the lowermost row R3 may be in closer spaced relation than the nozzles in the other rows and to this end the blocks in such row are correspondingly modified. Thus the cruciform blocks B^1 are narrower than the blocks B in order to permit additional blocks, B^2, which are devoid of walls 18, to be inserted between the blocks B'.

The primary purpose of having the gas nozzles in the bottom row R3 in closer relation than in the other rows is to permit the gas issuing from the bottom row of nozzles to serve as a protective gas blanket for the work, it being noted that the otherwise open space between the bottom row R3 and the adjacent side of the casing 10 is blocked off, as with cement, to prevent air from the casing 20 from flowing beneath said row.

The application of the burner to the furnace will be readily understood by reference to Fig. 5. The furnace shown is what is known in the art as a slot-type forge furnace. Thus there is provided in the side wall of the furnace a longitudinally extending slot 30 for the insertion and removal of the objects W to be heated. The heating chamber H of the furnace is preferably of uniform cross-sectional areas throughout its

length, the burner being positioned at one end of the chamber to fire longitudinally thereof. The gas issuing from the bottom row of burner nozzles will therefore flow next to the work and serve as a protective blanket tending to prevent the work from being oxidized or scaled by air tending to enter through the work slot 30, and also by the air flowing above the bottom row.

The pressures of the air and gas supplied to the burners will ordinarily be equal and relatively low in order that the gas flowing through the nozzle passages 15 and the air flowing through the passages 19 may be discharged in streamline flow without substantial turbulence. As a consequence of such flow the air and gas will mix primarily by interdiffusion with the consequent production of a relatively long flame which is highly luminous or radiant. The heat from the flame thus produced penetrates the gas blanket and hence the work is heated primarily by radiation from the flames of combustion.

What I claim is:

1. A tile for a gas burner comprising a block which intermediate its ends and for a substantial portion of its length is cruciform in cross section and which is axially apertured to form a nozzle.

2. A tile for a gas burner comprising a block which intermediate its ends and for a substantial portion of its length is cruciform in cross section and which at one end is formed as a tube, the tube passage being extended to the other end of the block.

3. In a gas burner, the combination of a casing through which air may flow, a plurality of bodies extending across and supported by said casing in spaced relation, each of said bodies comprising a multi-nozzled refractory structure and a conduit for supplying gas to said nozzles, the said structure between said nozzles being wedge-shape in cross section.

4. In a gas burner, the combination of a casing through which air may flow, a plurality of bodies extending across and supported by said casing in spaced relation, each of said bodies comprising a multi-nozzled refractory structure and a conduit for supplying gas to said nozzles, the said structure comprising a plurality of individually nozzled blocks arranged side by side in a row, each block being cruciform in cross section on a plane at right angles to the axis of its nozzle.

5. In a gas burner, the combination of a casing constituting a conduit for air, a plurality of elongate and hollow bodies extending in spaced parallel relation across the conduit and constituting conduits for gas, a series of nozzle blocks for each of the gas conduits, the blocks being arranged side by side in abutting relation with their backs abutting against their respective conduits and converging wedge-fashion forwardly therefrom, the nozzles constituting extensions beyond the apex of the wedge, and being in direct communication with their respective gas conduits.

6. In a gas burner, the combination of a casing constituting a conduit for air, a plurality of elongate and hollow bodies extending in spaced parallel relation across the conduit and constituting conduits for gas, a series of nozzle blocks for each of the gas conduits, the blocks being arranged side by side in abutting relation with their backs abutting against their respective conduits and converging wedge-fashion forwardly therefrom, the nozzles constituting extensions beyond the apex of the wedge, and being in direct communication with their respective gas conduits, and means for anchoring the blocks to their conduits comprising a section of tubing embedded in each block and extending therefrom into the conduit as an anchoring post.

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