Feb. 8, 1949. M. W. HOENSHELL 2,461,420

GAS BURNER CONSTRUCTION

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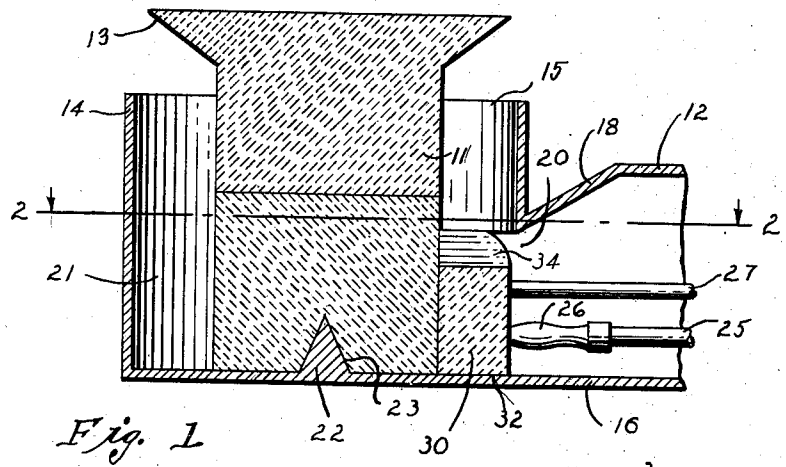


Fig. 1

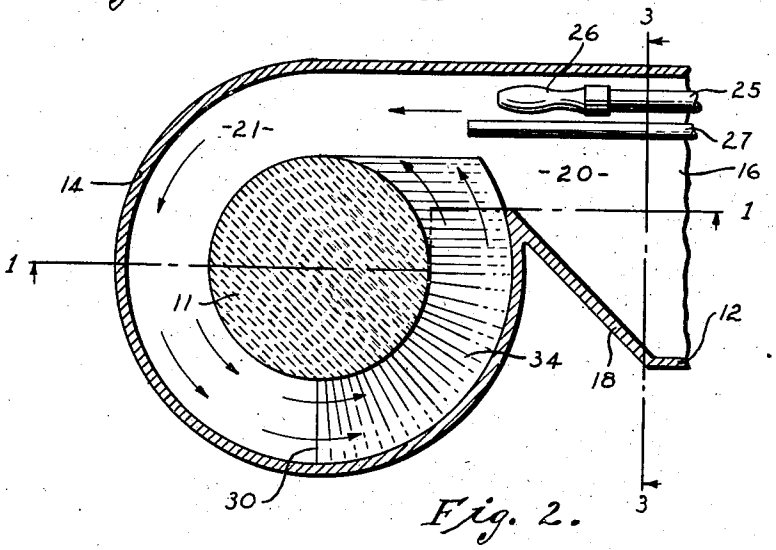


Fig. 2.

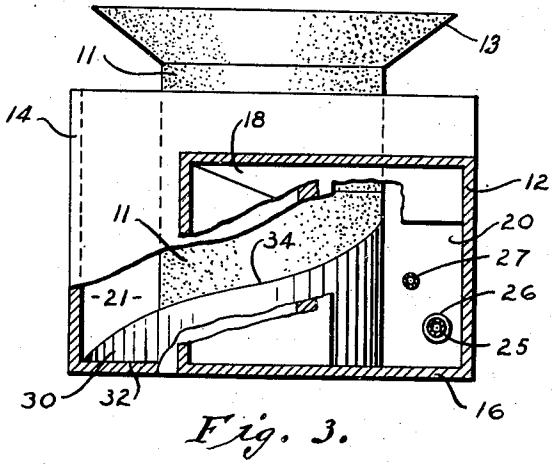


Fig. 3.

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GAS BURNER CONSTRUCTION

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2 Claims. (Cl. 158—7)

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The present invention relates to combustion appliances, and particularly to fuel burners for furnace apparatus designed for the combustion of gaseous fuel, and aims to devise an improved construction for the more efficient combustion of such fuel by improving the method of supply of the combustible mixture to the burner zone.

Accordingly, I have devised an improved burner construction for regulating the supply of the gas and air flow to the burner zone in such a way as to maintain a well defined path or course of movement of the mixture and at the same time avoid any conflict between the incoming air and gas flow and the outgoing fuel mixture which is being supplied to the fire chamber of the furnace.

To this end I provide a burner construction comprising a cylindrical housing member to which the combustible mixture is fed in tangential relation for producing a circular movement of the fuel mixture about a cylindrical block of refractory material located centrally of said housing member, and an improved structural means operating to confine the flow of the outgoing fuel mixture to a distinct path having no possible interference with the incoming flow of fuel ingredients and thereby promoting a more efficient flow of the fuel supply and resultant burner operation.

With the foregoing general objects in view, the invention will now be described by reference to the accompanying drawing representing a practical and satisfactory construction for the embodiment of the proposed improvements in an efficient operating relation, after which those features and combinations deemed to be novel and patentable will be particularly set forth and claimed.

In the drawing—

Figure 1 is a vertical sectional view illustrating a burner construction equipped with the improvements of the present invention, said view being a section taken on the line 1—1 of Figure 2;

Figure 2 is a horizontal sectional view, representing a section taken on the line 2—2 of Figure 1; and

Figure 3 is a transverse sectional view (with portions broken away), representing a section taken on the line 3—3 of Figure 2.

Referring now to the accompanying drawing detail, this shows the burner appliance as comprising a metallic boxing member having a rectangular portion 12 for projection through the front of the furnace ashpit, and a cylindrical burner housing portion 14 which is open at the top as indicated at 15, while both the portions 12

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and 14 of the boxing are provided with a continuous bottom 16 designed to rest upon the floor of the furnace ashpit.

The boxing portion 12 communicates with the burner housing portion 14 by way of a reduced neck portion 18 so arranged as to provide an outlet passage 20 from the boxing 12 communicating in approximately tangential relation to the housing 14 and thereby correspondingly directing the flow of air and gas into the annular space 21 surrounding a refractory block structure 11 located centrally within said housing portion 14. Preferably the bottom 16 is formed with a spur 22 or the like engaging in a corresponding recess 23 of the refractory block structure in position for locating the latter in substantially central relation to the space enclosed by the housing 14.

In burners of this type the fuel supply is admitted entirely by way of the passage through the boxing portion 12, the main flow of gas being supplied by a pipe 25 terminating in a nozzle 26 at the aforesaid passage 20. A similar gas supply pipe 27 terminates adjacent to said nozzle 26 for maintaining a pilot flame adjacent to the tip of the nozzle, and a proper supply of air is of course admitted to the housing portion 12 in the conventional manner as provided for in the apparatus set forth in Patent No. 2,027,159, dated January 7, 1936.

The upper end of the refractory block structure 11 may be formed with an outwardly projecting margin 13 overlying the annular space 21, the outer face of which margin slopes upwardly and thereby provides a baffle for deflecting the flame outwardly and at the same time permitting upward movement thereof in the direction of the interior surface of the walls of the furnace fire chamber.

For carrying out the purposes of the present invention I make provision for further controlling of the movement of the combustible mixture by introducing an additional block element 30, of fire brick or like refractory material and of substantially quadrantal shape, into that portion of the annular space 21 which completes the circuit of the combustible mixture within the housing portion 14, around the block structure 11. This block element 30 has a flat base portion 32 for resting upon the bottom 16 of the housing 14, and the upper face 34 of the block is of helical contour and extends from the level of said bottom 16 (i. e., from the bottom of the annular space 21) to approximately the same elevation as the top of the passage 20 representing the entrance opening of said space 21 within the housing 14.

By this means the flow of the entire combustible mixture of air and gas is directed upward prior to its completing a circuit around the refractory block structure and finally discharged above the level of the incoming gas and air from the housing portion 12. This has the important advantage of preventing any interference with the movement of the incoming air and gas supply, and also blocks any tendency of the latter from following any other course than the intended or forward tangential course around the refractory block as indicated by the arrows in Figure 2.

The operation of the burner is substantially as set forth in the aforesaid patent, as regards producing a vigorous turbulent condition within the annular space 21, which results in an intimate intermingling of the gas and air, as well as uniform distribution of the combustible mixture all around the burner and even flame distribution around the base of the furnace fire chamber; but with this increased important advantage that the provision of the helical block member 30 effectively eliminates any possible chance of interference between the flow of the incoming gas and air flow from the housing 12 with the combustible mixture in its course around the annular space 21, since by the improved construction the paths of movement of these two flows are thus kept definitely separated until the final combustible mixture is discharged at a level entirely above the opening 20 by way of which the incoming gas and air are admitted to said annular space 21.

By means of the foregoing improvement the operation of the burner appliance is very greatly increased in its efficiency, and at a relatively very small expense for the addition of the simple accessory feature necessary for thus altering or modifying the basic structural combination of the burner illustrated in the patent referred to.

While I have illustrated and described a very simple expedient for the carrying out of the proposed features of improvement, I desire to be understood as reserving the right to make such changes or modifications as may fairly fall within the spirit and scope of my invention as defined by the appended claims.

Having thus described my invention, what I claim is:

1. A fuel burner construction comprising, a cylindrical housing member open at its upper end, a cylindrical refractory block mounted centrally within said housing member and in spaced relation to the inner wall thereof to provide an annular space around said block, means providing a fuel supply passage for supplying a combustible fuel mixture to said annular space and communicating therewith at an angle substantially tangential to the cylindrical face of said block, and a helical refractory block in the space traversed by said fuel mixture as it completes its circuit through said annular space and provided with a curved and sloping upper face acting to direct the course of the fuel mixture to a level entirely above that of the flow through said fuel supply passage, said helical block terminating in an end face in the same tangential relation to said cylindrical block as said fuel supply passage.

2. A fuel burner construction comprising, a cylindrical housing member open at its upper end, a cylindrical refractory block mounted centrally within said housing member and in spaced relation to the inner wall thereof to provide an annular space around said block, the lower portion of said housing member being provided with a fuel supply passage for supplying a combustible fuel mixture to said annular space and communicating therewith at an angle substantially tangential to the cylindrical face of said block, and a helical refractory block in the space traversed by said fuel mixture as it completes its circuit through said annular space and provided with a curved and sloping upper face to direct the course of the fuel mixture to a level entirely above that of the flow through said fuel passage, said helical block terminating in a vertical end face extending in the same tangential relation to said cylindrical block as said fuel supply passage and forming the inner side wall of said passage.

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REFERENCES CITED

file of this patent:

The following references are of record in the

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Number	Name	Date
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2,027,159	Fulton	Jan. 7, 1936
2,123,204	Roberts	July 12, 1938
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