Aug. 10, 1926. 1,595,638

J. BEARD

GAS HEATER

Filed June 9, 1924

Fig. 1.

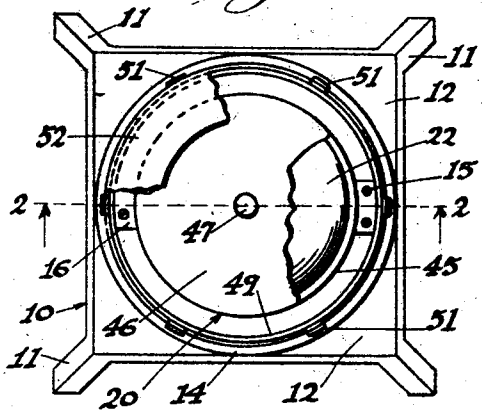


Fig. 3.

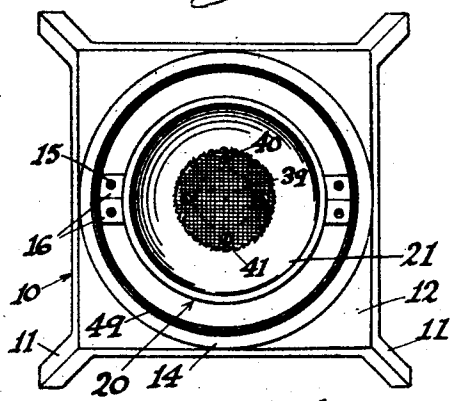


Fig. 4.

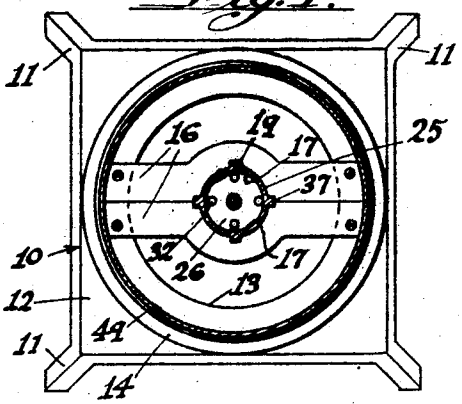


Fig. 2.

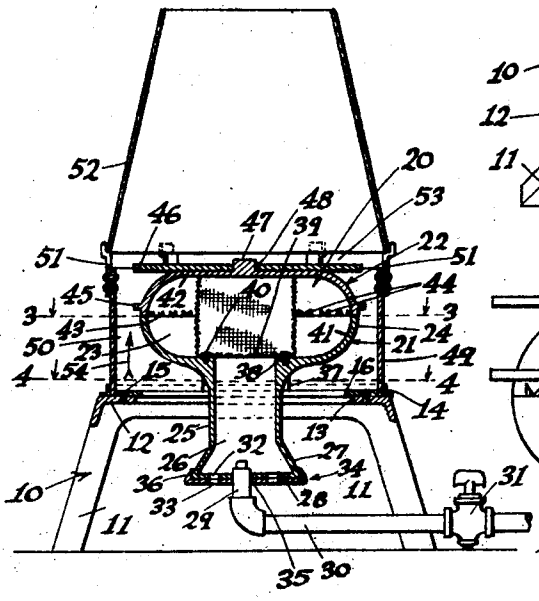
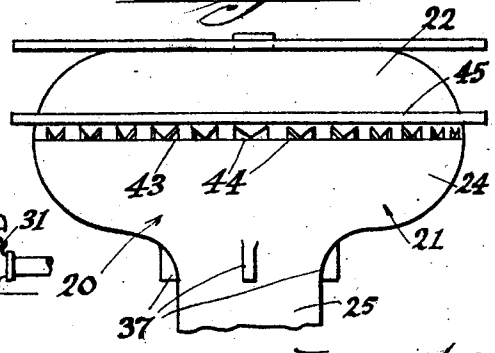


Fig. 5.



Witness:

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Patented Aug. 10, 1926. 1,595,638

UNITED STATES PATENT OFFICE.

JAMES BEARD, OF PASADENA, CALIFORNIA.

GAS HEATER.

Application filed June 9, 1924. Serial No. 718,788.

My invention relates to heaters especially adapted for heating air in the interior of houses or buildings, etc.

The object of my invention is to provide a heater employing gas as a fuel and constructed in such a manner that the combustion of the fuel passing through the heater is practically complete, thus eliminating to a high degree the formation and consequent introduction of carbon monoxide and carbon dioxide gases into the surrounding air.

The object of my invention is attained by the disclosure herein set forth by the following description of the accompanying drawings, from which the construction and advantages will be readily understood and the novel features thereof being particularly pointed out in the appended claims.

Referring to the drawings:

Figure 1 is a top plan view of the gas heater of my invention, parts being broken away and shown in section,

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1,

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2,

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 2, and

Fig. 5 is an enlarged fragmentary view of the burner.

Referring by numerals to the accompanying drawings, 10 designates a supporting frame or base comprising legs 11 and a top 12, in which is formed an annular opening 13 surrounded by an upstanding flange 14.

Mounted on the top 12 within the flange 14 and held in place by screws or bolts 15 are parallel plates 16 having semi-circular openings 17 which, when placed together, as shown in Fig. 4, form an opening 19 for supporting a burner generally designated at 20. The burner comprises hollow cast metal members 21 and 22 forming a gaseous fuel chamber 23. The upper portion 24 of the member 21 is in the form of an annular bowl from which depends a hollow cylinder 25 forming a gas and air mixing chamber 26.

The lower portion 27 of the cylinder is flared and is provided with a flat bottom 28 having a central aperture through which extends a vertical gas inlet pipe 29 leading from a horizontal pipe 30, in which a control valve 31 is interposed. An annular row of apertures 32 are formed in the bottom 28 and register with corresponding apertures 33 in a damper 34, also having a central opening 35 surrounding the pipe and rotatably mounted on the bottom and held in place by an inturned flange 36.

At the junction of the bowl portion and the depending cylinder is a series of lugs 37 which support the member 21 in an upright position on the plates 15 and 16, and also at this position on the interior is a flat face 38, upon which is positioned a metallic screen or gauze 39 which is held in place by screws 40.

An annular metallic screen 41 of a larger diameter than that of the cylinder is centrally positioned within the gaseous fuel chamber 23 and extends from the flat face 38 to the top of the interior of the upper member 22 which is in the form of an inverted bowl.

The member 22 is provided on its lower edge 43 with a screen of triangular indentations which form gaseous fuel jets 44 when the members 21 and 22 are assembled, as clearly shown in Fig. 5.

An annular flange 45 is cast integral with the member 21 above the jets and is of the same diameter as another flange 46 in the form of an annular plate resting on the top 42 and centrally positioned by a projection 47 extending through an aperture 48 formed in said plate and cast integral with the top 42. An annular jacket 49 of cast or sheet iron is centrally positioned on the base 10 by the flange 14 and surrounds the burner 20 and extends in height from the top 12 of the base 10 to the level of the flange plate, thus forming an enclosed air passage 50 around the burner.

A series of brackets 51 are fastened to the top portion of the jacket 49 and support a chimney 52, the bottom edge of which is held by the brackets a short distance above the top of the jacket in order to provide an air space 53.

When the heater is being utilized for the purpose described, gas is admitted into the mixing chamber 26 through pipes 29 and 30 by opening of the valve 31 and is mixed with air passing through the apertures 32 and 33 in the bottom and damper, the flow of gas through the mixing chamber 26 being retarded sufficiently by the screen 39 to cause a thorough mixing of air and gas. The gaseous fuel thus formed passes through the screen 39 into the interior of the annular screen 41 where it is super-

heated, thereby producing a fuel that is about 95% combustible before it enters the chamber 23. The superheating of the gaseous fuel is effected by the heat of the members 21 and 22 which become intensely hot, the screen being used to check the flow of the gaseous fuel long enough to superheat same and produce a highly combustible fuel.

The superheated combustible gaseous fuel passes from the annular screen 41 into the chamber 23, then through the series of triangular shaped jet openings 44 where it is continuously ignited.

The triangular shaped jet openings spread the flame which is at the same time urged into the draft of the upward current of air, (indicated by the arrows 54), by the flange 45. The flame striking the upward current of air at right angles results in the introduction of oxygen therein. The flame is then kept in line with the draft by the upper flange 46, at which point the draft is reinforced by the additional air entering through the space 53 between the bottom of the chimney and the top of the jacket, the chimney obviously utilized for inducing an upward current of air.

From the construction it will be seen that the gas and air are not only thoroughly mixed but superheated, thereby producing a gaseous fuel, that, when ignited, the combustion will be about 95%, thus eliminating carbon monoxide and carbon dioxide and other noxious gases; the remaining 5% of these elements being practically eliminated by the action of the upward current of air striking the flame.

Thus it will be seen that I have produced a gas heater that is economical in the consumption of gas and practically eliminates the introduction of carbon monoxide, carbon dioxide, and other noxious gases into the surrounding air.

Various changes may be made without departing from the spirit of the invention.

What is claimed is:

1. In a gas heater of the character described, a burner comprising an upper annular bowl shaped member having triangular indentations in the lower edge, a flange above the top of said indentations, a lower member supporting said upper member, said lower member having an upper portion in the form of an annular bowl of the same diameter as the upper member, a series of gaseous fuel jets being formed when the upper and lower members are placed together, a flange plate resting on top of said upper member and of the same diameter as the flange above the fuel jets, and a mixing chamber depending from said lower member, said mixing chamber being in the form of a hollow cylinder having a central aperture adapted to admit a fuel inlet pipe.

2. In a gas heater as claimed in claim 1, having in addition an annular jacket surrounding the bowl-shaped members and a chimney supported above the annular jacket and above the flange plate, there being an air space between the upper end of the annular plate and the lower end of the chimney.

3. In a gas heater as claimed in claim 1, having in addition a supporting base having legs and a top, the top forming a support for the lower bowl-shaped member and the mixing chamber depending below the top, and annular jacket supported on the plate surrounding the bowl-shaped members, the upper edge of said jacket being substantially on the same level as the annular plate, a series of brackets secured to the top portion of the jacket and a converging chimney positioned on said bracket, there being an annular air space between the upper end of the jacket and the lower end of the chimney.

4. In a gas heater of the character described, a burner comprising an upper annular bowl-shaped member having triangular indentations in the lower edge thereof, a flange above the top of said indentation, a lower member supporting said upper member, said lower member having an upper portion in the form of an annular bowl of the same diameter as the upper member, a series of gaseous fuel jet openings being formed when said upper and lower members are placed together, a flange plate resting on the top of said upper member and of the same diameter as the flange above the fuel jets, a mixing chamber depending from said lower member, said mixing chamber being in the form of a hollow cylinder having a flared lower end portion terminating in a flat bottom having a central aperture to admit a fuel inlet pipe, a series of apertures in said bottom, a damper rotatably mounted on said bottom having corresponding apertures to those in said bottom, a screen covering the top of said mixing chamber, and an annular screen centrally positioned within the bowl-shaped parts of said upper and lower members.

In testimony whereof I have signed my name to this specification.

JAMES BEARD.