

F. J. LIDSTONE.
GAS BURNER.
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1,052,420.

Patented Feb. 4, 1913.

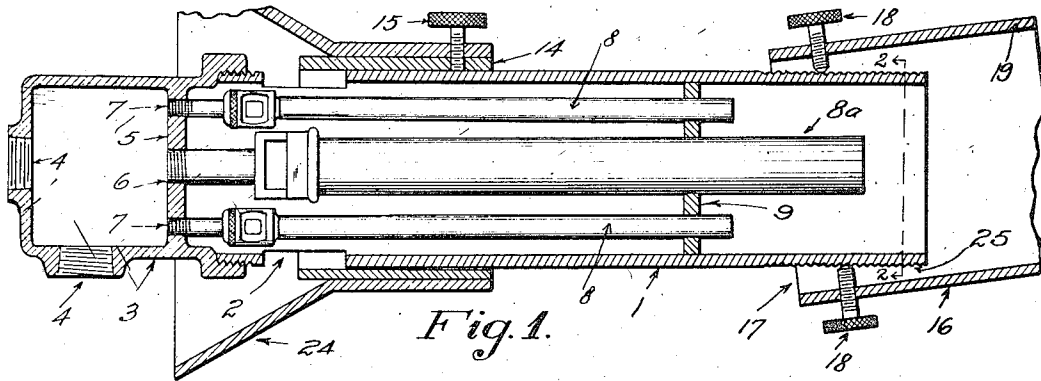


Fig. 1.

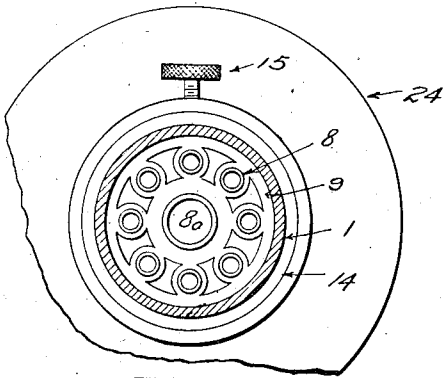


Fig. 2.

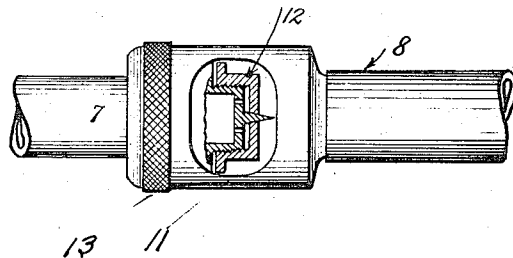


Fig. 3.

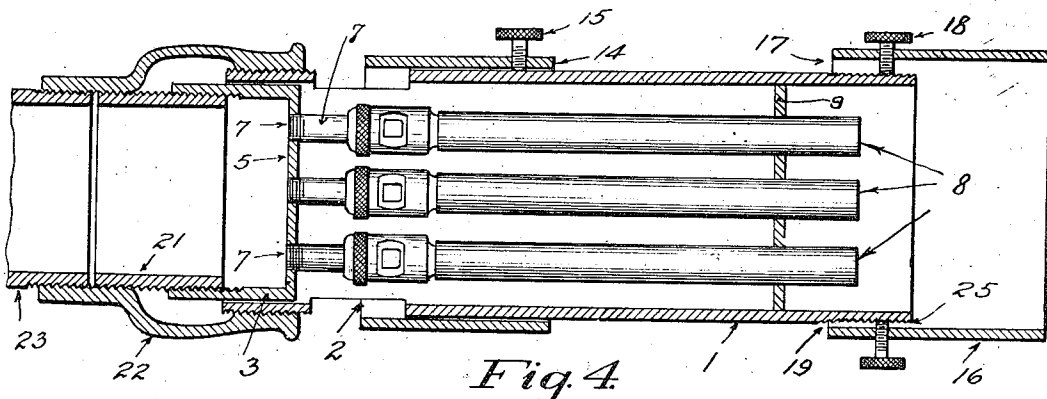


Fig. 4.

WITNESSES

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GAS-BURNER.

1,052,420.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK J. LIDSTONE, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Burners, of which the following is a specification.

This invention relates to gas burners.

The object of the invention is to provide an improved construction and arrangement of gas burner having high efficiency and low operating cost and which is simple in construction and made of but few parts.

The invention comprises the construction and arrangement of parts hereinafter described and claimed.

In the drawing Figure 1 represents a longitudinal cross sectional view through a burner constructed according to my invention; Fig. 2 is a cross section of the same on the line 2-2, Fig. 1, the protecting sleeve being omitted; Fig. 3 is detail view of one of the gas and air mixers; and Fig. 4 is a view corresponding to Fig. 1 of another form of burner and showing modifications.

The burner illustrated in the drawings may be used for a variety of purposes and for the production of heat wherever desired. It is particularly adapted for use as a burner for heating boilers; but is not limited to such use.

The main features of the invention are the provision of a plurality of gas and air mixers contained or leading into a common casing or chamber in which the fuel is partially consumed, and a deflector or protecting member at the inward end of the casing to direct the flame in the most advantageous direction and manner and so arranged as to permit the supply of air at its base to complete combustion of the fuel.

The burner illustrated in Figs. 1 to 3 of the drawings comprises a casing 1, preferably formed as a wrought iron tube of some length, and having one or more side openings or apertures 2 at its base for the admission of air thereinto. The base or outward portion of casing 1 is screwed or otherwise secured in the inward end of a body or base member 3 forming the fuel inlet to the burner. As shown, the body or base is provided with one or more fuel inlets 4 through its side or bottom or both and to which suitable connections for gas supply

may be made, and with a transverse wall or plate 5 at its inward end, provided with apertures 6, in which are screwed or otherwise secured fittings 7, forming means of communication between the mixers 8 and the fuel supply member 3. A plurality of mixers 8 are used in the present device and their number and arrangement may be varied according to circumstances and the size and capacity of burner desired. In the embodiment shown, nine such mixers are illustrated. These mixers 8 project inwardly along casing 1 and are suitably supported at the inward end thereof, preferably, in such a manner as to regularly space the same apart, by a skeleton plate or spider 9 formed with apertures through which the mixers 8 project and other apertures through which the air in casing 1 may pass. Each of the mixers 8 is in the form of an ordinary Bunsen burner, screwed or otherwise secured to the forward end of one of the fittings 7. The bunsens 8 may be of any convenient size and form and each is provided with the usual air inlet 11 and any suitable or preferred form of regulating valve 12 for controlling the supply of fuel thereto. If desired, suitable adjusting means 13 may be provided for regulating the supply of air to each of the bunsens 8, although such means is not essential. All of the mixers may be of the same construction, if desired, although in the embodiment shown in Fig. 1, the central mixer 8^a is of larger size than the others and projects forwardly through the center of spider 9 with its end or mouth in advance of the mouths of mixers 8.

To control the admission of air to the casing and to all of the burners, a suitable regulating sleeve or member 14 is provided. This is mounted upon the exterior of casing 1 and adjustable therealong to cover or uncover the openings 2, as desired. Preferably, suitable means, as a set screw 15, is provided to fix the sleeve in adjusted position.

The burner is preferably provided with a suitable cone or bell shaped shield or apron 24, which flares rearwardly along the burner and away from its mouth. This shield or apron surrounds the openings 2 and directs the air thereinto. At the same time it protects the burner from the effects of irregular drafts in the outer air and centralizes

and equalizes the supply of air to all sides of the burner and to each of the burners 8. This shield may be mounted in any suitable manner, preferably to be movable with the sleeve member 14, and secured thereto by the screw 15 which clamps the sleeve to the casing, as shown.

The casing 1 is suitably mounted in the furnace setting to project thereinto. To protect the casing from the bad effects of high temperature, a suitable protecting and deflecting member or sleeve 16 is adjustably mounted upon the forward end of casing 1. This sleeve is of larger diameter than the exterior of casing 1 and is spaced therefrom to permit the entrance of air through the space 17 between the sleeve and casing to obtain a final mixture of fuel and air. To space the sleeve from the casing, one or more suitable adjusting screws 18 are provided, preferably, four such screws being used. By loosening one or two of these adjusting members and tightening up the others, the sleeve may be given any desired eccentric position upon the forward end of casing 1, thus permitting variation in the quantities of air supplied to different sides of the burner at its mouth. The forward end of the casing 1 is preferably roughened or grooved in any suitable manner, as by threading, nurling or pressing, and as indicated at 25, to afford a firm grip for the adjusting and securing screws 18, as will more fully hereinafter appear.

The burner described operates as follows:—Gas connections are provided to the inlets 4 of gas supply member 3 and a supply of fuel is fed to each of the mixers 8 and 8^a. The sleeve 14 is adjusted upon casing 1 to permit the entrance of air through the apertures 2 to the interior of the casing and around the bases of mixers 8, 8^a. This air is led quietly and regularly to the openings 2 by the shield or apron 24, as stated. As will be observed, the valves or regulators 12 on the mixers 8 are accessible through the openings or apertures 2 in casing 1. These are manually adjusted to permit the passage of fuel through fittings 7 and mixers 8. Air is also drawn into the mixers 8 through the openings 11 in their bases and during its passage through each of the mixers, the supply of gas and air is thoroughly and intimately mixed. If the mixers are all of the same length, the gas burns at the mouths of the mixers, at which point the mixture of gas and air passing through each mixer is supplemented by an additional supply of air coming through ports or apertures 2 and passing along the interior of casing 1 around the burners or mixers 8 or 8^a. This results in a second mixing of air with the fuel at the point of combustion of the same.

In the embodiment shown in Fig. 1, the

burner 8^a is longer than the others, as described. In this burner, the fuel burns at the forward end of the mixer 8^a. That fuel supplied through the shorter mixers 8 passes forwardly through casing 1 around mixer 8^a and is more intimately mixed with the additional supply of air in the casing, and burns opposite the mouth of mixer 8^a.

Since the sleeve 16 is larger than the casing 1, additional air enters through the space 17 as described. Thus a third mixture of air and fuel is obtained at the mouth or inward end of casing 1. The sleeve 16 also acts as a protector to prevent burning of the end of casing 1, since the cool air entering through space 17 keeps the temperature of casing 1 down below the point at which it would be injured. Moreover, by adjusting the screws 18 in the manner described, the casing 16 may be eccentrically positioned upon casing 1. As illustrated in Fig. 4, one side of the casing marked 19, is then nearer to the axis of the burner than the other side. The inrush of the greater quantity of air through the wider portion of space 17 on the opposite side of the casing causes deflection of the flame toward the side 19 of the sleeve 16 and bends the flame in the direction of that side of the sleeve. By properly adjusting the sleeve 16 upon the casing, the burning gases may be conducted or directed to the most advantageous location in the furnace. This effect may also be amplified by angular adjustment of the sleeve upon the casing in the manner heretofore described and illustrated in Fig. 1, the roughening 25 permitting the securement of the sleeve in such positions.

The burner described is of simple construction and its parts may be readily renewed. The mixers 8 may be of the usual construction of Bunsen burners, many forms of which may be purchased in the open market, and consequently can be renewed as often as desired.

Fig. 4 illustrates a modification in which three mixers 8 are illustrated. These mixers project forwardly through casing 1 and are of the same length. The base or body in this burner, instead of being formed as a single member, comprises a number of parts. The mixers 8 are connected to a transverse plate or wall 5 at the forward end of a head or box 3, in the base of which is mounted nipple 21. A suitable fitting 22 is threaded at its inner and outer ends and connects the nipple 21 and the base of casing 1, thus securing the head or box 3 to the casing. The fitting 22 at the same time forms a means of connection to the gas supply pipe marked 23. Otherwise, this form of the invention is the same as that above described.

What I claim is:—

1. A gas burner comprising a casing hav-

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ing an air inlet at its base, a fuel supply member connected to said casing, a plurality of fuel and air mixers in said casing and connected to said fuel supply member, and means in said casing for supporting and spacing said mixers apart and arranged to permit the passage of air therethrough and along the casing.

2. A gas burner comprising a casing having an air inlet at its base, a fuel supply member connected to said casing, a plurality of fuel and air mixers in said casing and connected to said fuel supply member, and a plate in said casing for supporting and spacing said mixers apart, said plate being provided with apertures through which said mixers project and with other apertures arranged to permit the passage of air through said plate and along the casing.

3. A gas burner comprising a casing having side air inlets at its base, a fuel supply member connected to said casing, and a plurality of fuel and air mixers connected to said member and having air inlets at their bases opposite to the air inlets of the casing, each mixer being provided with a separate regulating valve for controlling the fuel supply thereto, said regulating valves being accessible through the air inlets to the casing.

4. A gas burner comprising a casing formed as a tube and having side air inlets at its base, a fuel supply member connected to said casing, a plurality of fuel and air mixers in said casing and connected to said fuel supply member, a regulating member movable on said tube for controlling the admission of air through said air inlets, and a protecting apron secured to and carried by said regulating member.

5. A gas burner comprising a casing having an air inlet at its base, a fuel supply

member connected to said casing, a plurality of fuel and air mixers in said casing and connected to said fuel supply member, a regulating sleeve on said casing for controlling said air inlet, a protecting sleeve surrounding said regulating sleeve, and a single means for adjustably securing said sleeves to said casing.

6. A gas burner comprising a casing having an air inlet at its base, a fuel supply member connected to said casing, a plurality of fuel and air mixers in said casing and connected to said fuel supply member, a protecting sleeve of greater diameter throughout its length than the casing and surrounding and supported on the inner end thereof and open at both ends for the passage of air between the sleeve and casing, and means for adjusting said sleeve into different positions laterally on said casing.

7. A gas burner comprising a casing having an air inlet at its base, a fuel supply member connected to said casing, a plurality of fuel and air mixers in said casing and connected to said fuel supply member, an adjustable protecting sleeve surrounding the forward end of the casing, said sleeve being open at both ends for the passage of air between the sleeve and casing and, throughout its length, being of greater diameter than the diameter of the casing and being also adjustable to different angular positions on and with respect to said casing, and a plurality of adjusting members on said sleeve and engaging said casing for adjusting and supporting the sleeve thereon.

In testimony whereof, I have hereunto set my hand.

FREDERICK J. LIDSTONE.

Witnesses:

ELBERT L. HYDE,
MARY E. CAHOON.