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B. F. CROW

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GAS BURNER

Filed Aug. 13, 1928

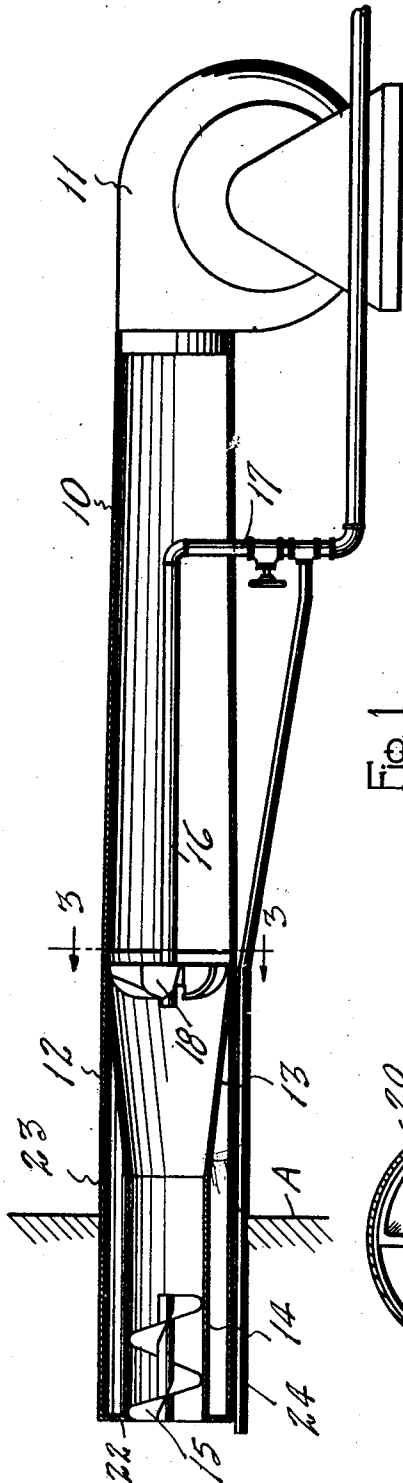


Fig. 1

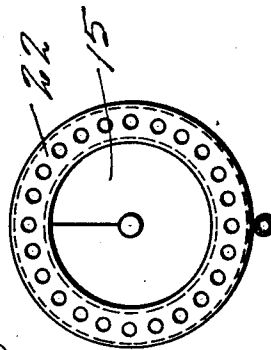


Fig. 2

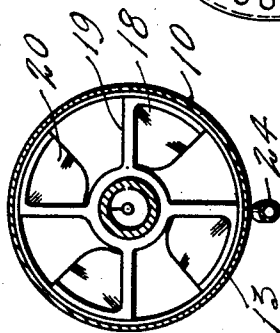


Fig. 3

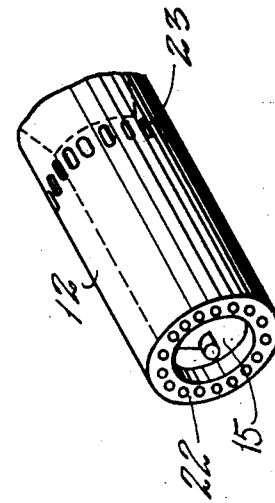


Fig. 4



Fig. 5

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GAS BURNER

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This invention relates to new and useful improvements in gas burners.

One object of the invention is to provide a gas burner of the air blower type in which the mixture of air and gas is delivered into a Venturi tube, whereby the velocity of the flowing mixture is increased and a more combustible mixture is had.

Another object of the invention is to provide a spiral baffle at the air entrance to the Venturi tube, whereby the entering air is whirled and thus caused to more thoroughly mix with the gas in the tube. The gas may also be whirled by a spiral baffle in the end of the gas supply pipe, the direction of the gas whirl being opposite to that of the air, whereby the air is more thoroughly saturated with the gas.

Still another object of the invention is to provide a sleeve surrounding the Venturi tube and an air admitting opening and an air discharge surrounding the discharge end of said tube, whereby secondary air is supplied to the flame of the burner.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings in which an example of the invention is shown, and wherein:

Fig. 1 is a longitudinal sectional view showing a burner constructed in accordance with the invention,

Fig. 2 is a front end elevation of the burner nozzle,

Fig. 3 is an enlarged transverse sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the front portion of the nozzle, and

Fig. 5 is a detail of the gas supply pipe and its baffle.

In the drawings the numeral 10 designates a tubular air conductor which may be flared toward its discharge end and is connected at its opposite end with a blower fan 11 for supplying air to the conductor under a very light pressure. The conductor may be made integral with or otherwise attached to one end

of a sleeve 12 forming part of a burner nozzle and adapted to be inserted through the wall A of a furnace so as to project into the fire box (not shown). The sleeve 12 is shown as a continuation of the conductor 10, but it may be otherwise.

A Venturi tube 13 is inserted in the sleeve but is open only to the conductor 10. The end of the tube forms the division between the sleeve and the conductor. The tube has a cylindrical extension 14 in which a spiral baffle 15 is mounted and extends inwardly from the discharge end thereof. A gas supply pipe 16 extends axially of the conductor and has its discharge end terminating in the mouth of the tube 13. This pipe is connected with a feed pipe 17 extending through the wall of the conductor 10 and having a suitable source of supply.

In the entrance end of the tube 13 a spiral baffle 18 is mounted so as to surround the end of the pipe 18. This baffle, as is illustrated in Figs. 1 and 3, includes a plurality of radial blades 19 having laterally extending cupped wings 20 open to the air flowing from the conductor 10. The air striking in the cupped wings and passing between the blades is deflected and caused to whirl as it flows through the tube 13. The wings are so set as to cause the air to whirl in a clockwise direction upon entering the tube.

In order to thoroughly mix the air and gas, a spiral baffle 21 is inserted in the discharge end of the gas pipe 16, as is shown best in Fig. 5, and this baffle is set to whirl the gas in a counter-clockwise direction as it is discharged into the Venturi tube and also into the whirling air. The opposite revolutions of the air and gas will promote a more thorough mixture.

The Venturi tube will increase the velocity of the gaseous mixture, which upon striking the baffle 15 will be whirled in a clockwise direction and thus discharged in a highly combustible state. A perforated ring 22 connects the tip ends of the sleeve 12 and the extension 14. Outside of the wall A the sleeve is provided with air inlets 23 for admitting secondary air. The gaseous mixture discharged from the tube into the fire box cre-

ates sufficient suction to draw in air through the openings 23 and this air being discharged through the ring 22 admixes with the gaseous mixture and promotes combustion, as well as adding to the efficiency of the burner. A pilot pipe 24 extends along the sleeve 12 and terminates at the end of the burner.

A burner of this character is very economical and by thoroughly saturating the air with gas and by supplying sufficient oxygen a very intense flame is produced. The gas and air being kept in motion from the point of their initial mixture make for better combustion and also a considerable saving in fuel is had because of the relatively large proportion of air which is used.

Various changes in the size and shape of the different parts, as well as modifications and alterations, may be made within the scope of the appended claims.

What I claim, is:

1. In a gas burner, an air conductor for connection with an air blower, a Venturi tube connected with the conductor for receiving mechanically-propelled air therefrom, an air baffle at the entrance to the tube for whirling the air delivered to the tube, a gas supply pipe discharging gas into the tube beyond the air baffle, a secondary air conveyor surrounding the tube and discharging air around the tip end of the tube, and a spiral baffle in the discharge end of the tube for whirling the gaseous mixture.

2. In a gas burner, an air conductor for connection with an air blower, a Venturi tube connected with the conductor for receiving mechanically-propelled air therefrom, an air baffle at the entrance to the tube for whirling the air delivered to the tube, a gas supply pipe extending axially through the air baffle for delivering gas into the whirling air, a spiral baffle in the discharge end of the gas pipe set to whirl the gas counter to the whirl of the air, and a spiral baffle in the discharge end of the tube for whirling the gaseous mixture just prior to ignition.

3. In a gas burner, a tubular air conductor for connection with an air blower, a sleeve attached to the conductor, a Venturi tube within the sleeve open only to the conductor and receiving all the air discharged therefrom, a gas pipe extending into the tube, a spiral baffle mounted in the entrance end of the tube and surrounding the gas pipe, a spiral gas baffle in the discharge end of the gas pipe, a perforated ring connecting the outer ends of the sleeve and the tube, said sleeve having air admitting openings remote from the ring, and a spiral baffle in the outer end of the tube for whirling the gaseous mixture prior to its admixture with the secondary air from the ring and sleeve.

4. In a gas burning device, an air blower, a tubular air conductor extending from the exhaust of the blower and receiving air solely

from said blower, a Venturi tube extending co-axially with and from the conductor and receiving air solely from said conductor, an air baffle at the entrance to the tube for whirling the air delivered to said tube, and a gas supply pipe discharging gas into the tube beyond the air baffle.

5. A gas burning device as set forth in claim 4, in which the gas supply pipe extends co-axially through the baffle from the tubular conductor and into the tube.

6. A gas burning device as set forth in claim 4, with a spiral baffle in the discharge end of the gas pipe to whirl the gas counter to the whirl of the air.

7. A gas burning device as set forth in claim 4, with a secondary air conveyor surrounding the tube and discharging air around the tip of said tube.

In testimony whereof I affix my signature. 85
BENJAMIN F. CROW.

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