Nov. 8, 1932. R. H. FORNEY 1,887,150

FUEL BURNER DEVICE

Filed April 1, 1929 2 Sheets-Sheet 1

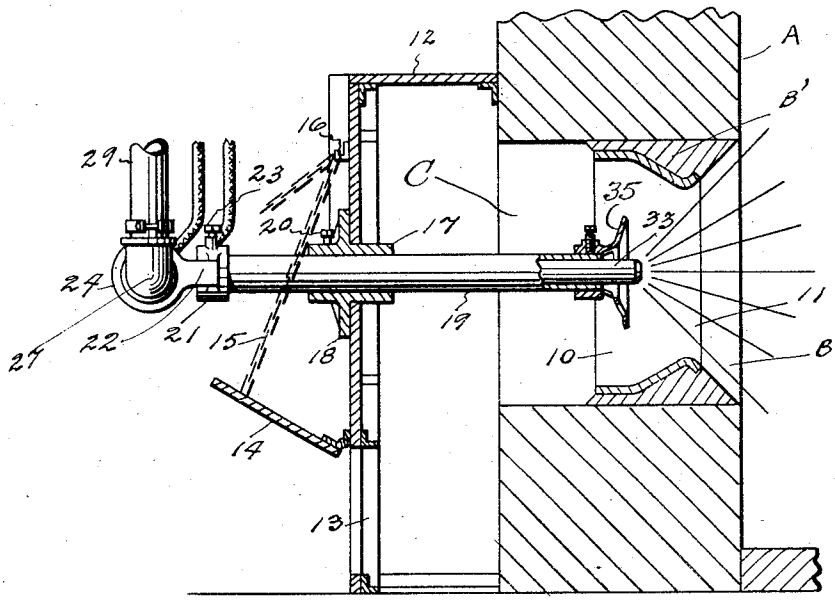


Fig. 1

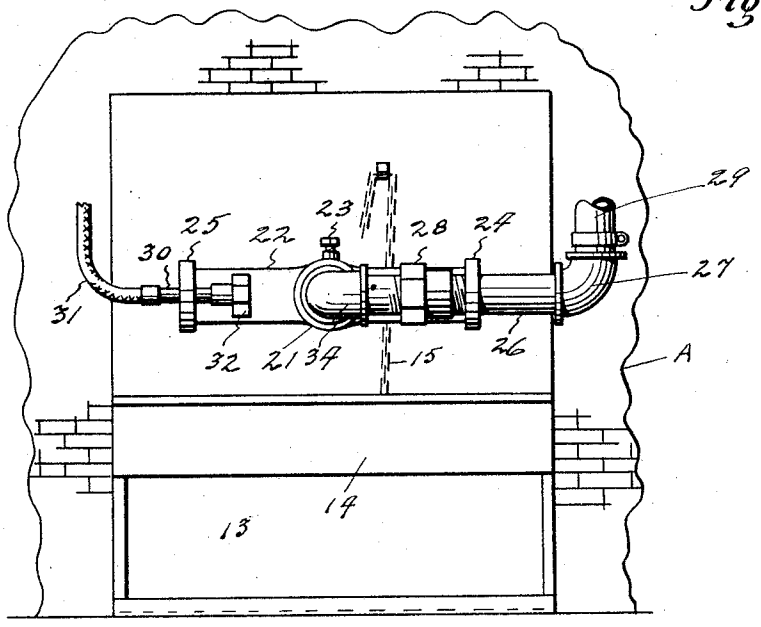


Fig. 2

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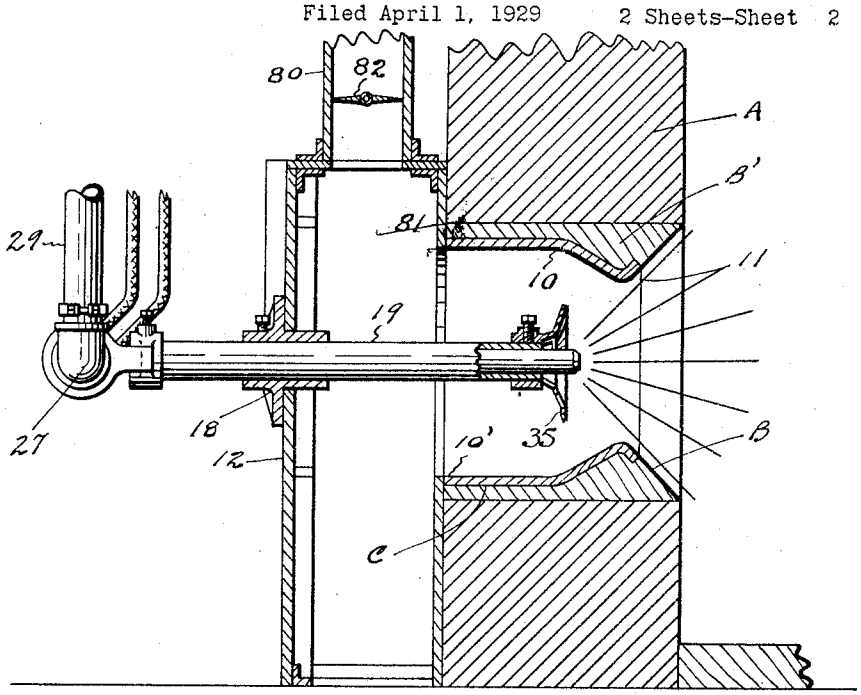


Fig. 3.

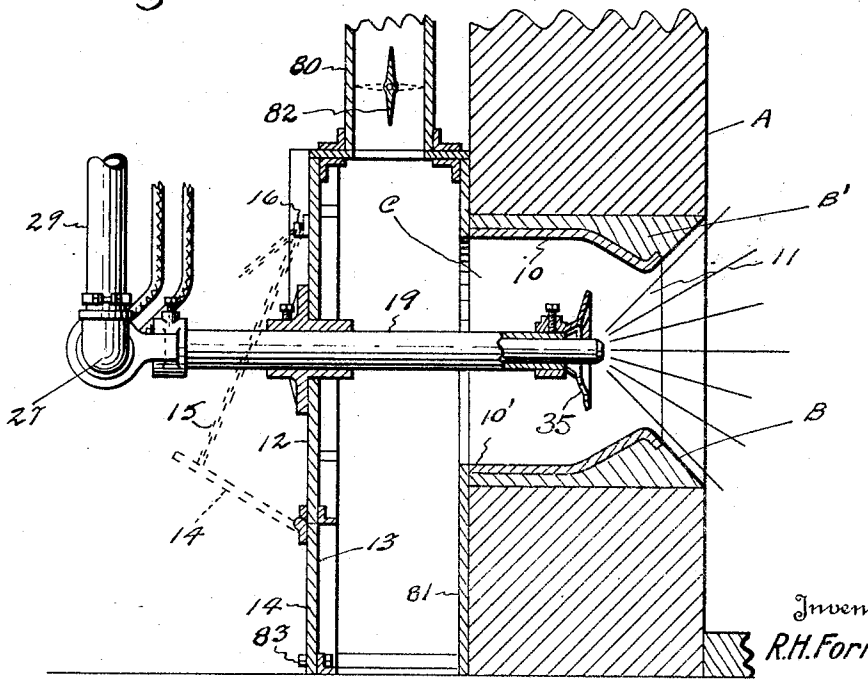


Fig. 4.

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UNITED STATES PATENT OFFICE

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FUEL BURNER DEVICE

Application filed April 1, 1929. Serial No. 351,712.

This invention relates to new and useful improvements in fuel burner devices.

One object of the invention is to provide a burner especially adapted to be used in conjunction with an air box and adapted to use various kinds of fuel.

A further object of the invention is to provide a burner including a conical burner barrel co-acting with an air deflector in taking air from an air box, whereby an intense flame having high heating qualities is produced.

Another object of the invention is to provide an improved sleeve mounting.

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 vertical sectional view of the front of a furnace fire box showing a burner constructed in accordance with the invention mounted therein,

Fig. 2 is a front elevation of the same,

Fig. 3 is a view similar to Fig. 1 showing the burner mounted for use in connection with a forced draft equipment, and

Fig. 4 is a similar view showing a combination where either forced or induced draft may be used.

In the drawings the numeral 10 designates a metal barrel, cylindrical at its rear or outer end and frusto-conical at its inner or front end from which the flame is projected. The barrel is designed to be embedded in the fire opening C of the furnace wall A with its rear end and its front end terminating within the wall. The frusto-conical portion of the barrel causes a concentration of the currents and these are discharged through a bell or outwardly flared lip 11 at the front end of the barrel.

The wall A of the furnace wall has a flared or frusto-conical port B flush with the bell and consequently the heated currents which are concentrated in the frusto-conical portion of the barrel, are expanded and spread when passing through the bell and port. This arrangement makes for a thorough mixing of the air and gas currents as well as for an ample and hot flame.

An upright metal air box 12 is fitted against the outer face of the furnace wall A so as to cover and extend above the fire opening C. This box may be of any suitable construction. A transverse draft opening 13 is provided in the front wall at the bottom of the box below the fire opening C. A damper or draft door 14 is hinged to the top of the opening and is supported by a chain 15 adjustably engaged with a hook 16, whereby the damper may be suspended at different heights to control the draft.

An elongated collar 17 is mounted in the front wall of the box 12 and has a radial flange 18 secured to the face of said wall. The collar extends on both sides of the said front wall and carries a set screw 20. An elongated fuel sleeve 19 forming part of a fuel assembly has a free sliding fit in the collar and is fastened in position by the set screw 20 carried in the outer projection of the collar. An air deflector 35 is mounted on the sleeve within the opening C. The extension of the sleeve into the opening C and the barrel may be regulated as desired. On the outer or rear end of the sleeve is fastened the collar 21 of a yoke-shaped bracket 22. The bracket is fastened in a horizontal position by a set screw 23 engaging the sleeve.

One arm of the bracket has an ear 24, while the other arm of said bracket has a smaller ear 25. A pipe nipple 26 is mounted in the ear 24 and is screwed into an elbow 27 at one end and has a union 28 mounted on its other end on the opposite side of the ear. The elbow is suitably secured to the end of a flexible conduit or hose 29 through which gas is supplied from a suitable source. An elongated nipple 30 is mounted in the ear 25 and is suitably attached at its outer end to a flexible conduit or hose 31 through which oil or other substitute fuel is supplied. On the inner end of the nipple is mounted a union 32.

One of the features of the structure is the quick change over from one fuel to another and the mounting of the fuel supply conduc-

tors in the bracket equipped with unions contiguous to the entrance to the fuel sleeve 19 makes for an expeditious carrying out of this feature.

When gas is being used as a fuel, an elongated fuel tube 33 is telescoped into the sleeve 19. The tube has a snug fit, but is loose enough to be slid freely in the sleeve. An elbow 34 is screwed onto the outer end of the tube and is positioned within the bracket 22. This elbow has external screw threads for receiving the nut of the union 28. Thus to disconnect the gas hook-up it is merely necessary to unscrew the nut of the union 28, grasp the elbow 34 and withdraw the gas tube from the sleeve 19.

The deflector 35 is located in the barrel 10 in advance of the frusto conical end thereof so that the gaseous currents, resulting from the admixture of air and gas, are deflected thereby and directed through the bell 11. The draft currents are concentrated in the frusto conical end of the barrel and mixed with the gaseous currents projected from the burner, thus causing the flame to spread through the bell 11 and frusto conical port B into the fire box. This results in a maximum combustion and a hot flame of high heat potentiality.

When the gas supply is suddenly interrupted, as by a break in the main which is quite common in natural gas territories, it is desirable to quickly change to a substitute fuel. If this change can be quicky made very little drop will occur in the steam pressure. As hereinbefore stated, by disconnecting the union 28 the gas tube 33 is uncoupled and may be readily withdrawn from the sleeve 19. A suitable oil tube (not shown) may be inserted in the sleeve 19 and connected with the union 32.

In Fig. 3 the air box 12 is made without the draft opening 13 and a forced draft flue 80 is connected to the top of the box, whereby the burner may be operated under a forced draft. The barrel 10 is formed with an extension 10′ which abuts a lining plate 81 placed against the face of the furnace wall. The wall, the lining B′ and the opening C are thus protected from the hot air currents and the forced draft. A regulating damper 82 is mounted in the flue 80.

In Fig. 4 the parts are the same as in Fig. 3 except that the transverse draft opening 13 is provided in the front wall of the box. The door 14 is hinged in this opening and provided with the chain 15 adjustable on the hook 16. When it is desired to use a forced draft the door 14 is fastened in its closed position by one or more bolts 83. When it is desired to use an induced or natural draft the damper 82 is closed and the forced draft is cut off from the flue 80. By removing the bolt 83 the door 14 may be opened and air supplied to the box through the opening 13.

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 fuel burner mounting, the combination with the burner port of a furnace fire box, of a barrel mounted in said port and having one end contracted and provided with an outwardly flared bell within said port, the barrel being free from metallic fastenings exterior of the fire box wall, and a plastic lining in which said barrel is embedded and constituting its sole means of fastening in the fire box.

2. In a fuel burner device, an upright air box having a front wall and a damper controlled air inlet, said box being constructed to be mounted in front of the fire opening of a furnace so that its front wall is spaced a substantial distance from the furnace wall, a flanged collar mounted in the front wall of the air box, a sleeve adjustably mounted in the collar and extending through the box into the furnace, an air deflector on the inner end of the sleeve, and a burner tube adjustable in the sleeve and having a nozzle coacting with the air deflector.

3. In a fuel burner device, the combination with a furnace wall having a fire opening, of an upright rectangular air box extending up the face of the furnace wall from the base thereof and enclosing the fire opening, said box being self-supporting, the box having an air opening in its lower front wall below the fire opening of the furnace wall, a damper for closing the box opening, a burner support mounted in the front wall of the box, and a burner tube mounted in the support and extending into the fire opening.

In testimony whereof I affix my signature.

ROSS H. FORNEY.