

May 10, 1932.

S. C. PAGE

1,857,862

IGNITER

Filed April 2, 1928

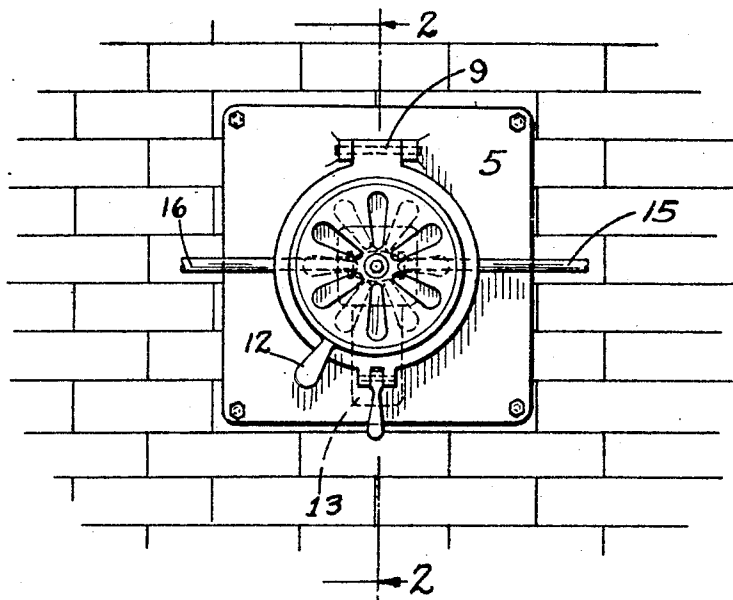


Fig. 1

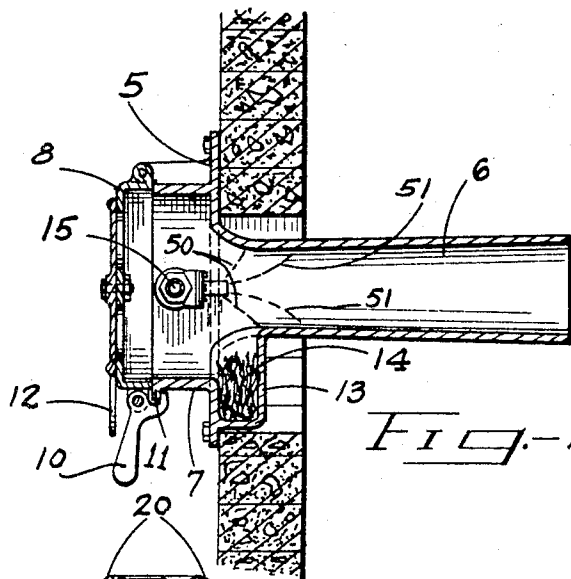


Fig. 2

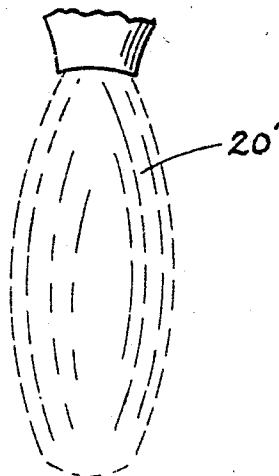
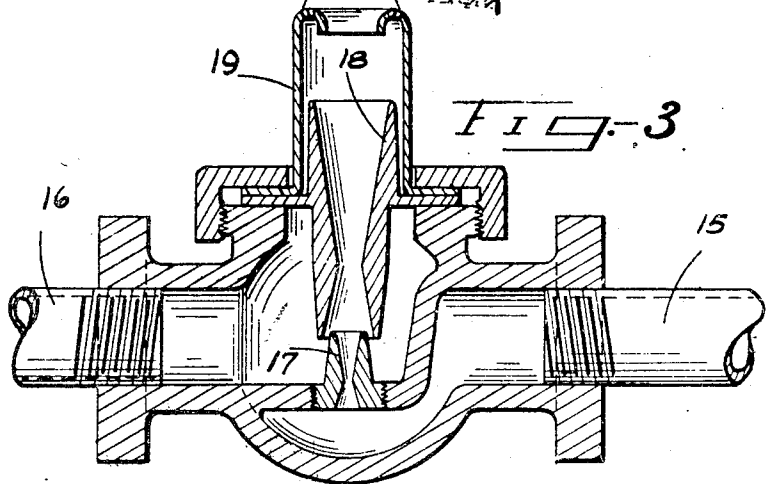


Fig. 3

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This invention relates to igniters for furnaces employing pulverized or atomized fuel. In the past when it was desired to ignite or cut-in a furnace using pulverized coal the blower for introducing the powdered fuel into the furnace chamber was started and the attendant introduced a torch into the chamber to ignite the powdered fuel. The torches commonly used consisted of nothing more than a pipe or staff with waste dipped in oil attached thereto. Since the interior of the chamber was almost completely filled with powdered fuel the introduction of a torch of this kind sometimes caused an explosion which blew open the doors of the furnace and endangered the attendants. When such an explosion did not take place there was frequently difficulty in igniting the powdered fuel because of the fact that the torch flame was not always sufficiently hot to cause the fuel to ignite. In addition to these difficulties there was usually a considerable waste of fuel since much of it was blown up the stack or chimney before the furnace could be ignited.

In accordance with the present invention it is proposed to employ an igniter with the flame sufficiently hot to cause immediate complete combustion of the fuel as soon as the blower is started in operation. Another feature of the invention is that it produces a flame of such character and area that it is not easily blown out by the current of powdered fuel.

Other features of the invention will appear from the detailed description and appended claims.

In the drawings Fig. 1 represents a portion of the wall of a furnace having an opening therein in which there is mounted an ignition unit including means for igniting the furnace. Fig. 2 is a vertical section on the line 2—2 of Fig. 1 looking in the direction of the arrows while Fig. 3 is a section through the burner which forms a part of the present invention.

Although the invention is intended for use in any type of furnace using liquid or pulverized fuel it is particularly adapted for use in a furnace of the type having a De Wolf wall for in such a furnace the wall is

so constructed that several of the fire bricks may be removed without perceptibly weakening a furnace already in use, to form an opening in which the unit including the igniter may be mounted. This unit includes a plate 5 mounted on the outer wall of the furnace by suitable bolts and provided with an integral Venturi tube 6 of circular, rectangular or any desired form in cross-section which extends into the furnace preferably at right angles to a stream 20' of pulverized or atomized fuel introduced by a blower (not shown) into the furnace. On the front side of the plate there is provided an integral circular sleeve 7 with which there cooperates a door 8 hinged at 9 and provided with a suitable latch 10 engaging a projection 11 on the sleeve. It will be noted that the door is hinged at the top so that it will be closed under the force of gravity and the latch 10 is so constructed that when the door is closed it is locked in closed position, all of which is in accordance with safety requirements. The front of the door has a rotary damper controlled by the handle 12 so arranged that the supply of air can be regulated at will. At the lower side of the unit within the door there is provided a chamber 13 in which there is placed a wick 14 consisting of asbestos and this chamber may be equipped with a pipe (not shown) for automatically supplying it with a predetermined level of oil or liquid fuel as needed. The sides of the sleeve 7 are tapped to receive an air supply pipe 15 and an oil supply pipe 16. These pipes terminate in a burner shown in detail in Fig. 3 where the oil is atomized and burned. This burner includes a venturi 17 through which air or steam under pressure escapes from the pipe 15. Oil or liquid fuel however escapes from the pipe 16 through a second venturi 18 in alignment with the first, an arrangement which in practice has effected especially satisfactory carburetion. The outlet of the second venturi 18 extends into a tube 19 terminating directly above the wick 14 and having its free edge formed with a cuff or free end turned back within the tube, an arrangement which prevents unatomized oil or fuel from running down into the fur-

nace. Openings 20 of any desired number are provided in the cuff portion of the sleeve 19 which openings have proved to be especially effective in use since they serve as jets through which a richer portion of the mixture passes and burns with a smoky flame not as easily extinguished as the main portion of the flame fed with highly atomized fuel passing through the large opening in the sleeve. These jets project the smoky flame toward the sides of the tube 6 as indicated by the lines 50. In this way if the large flame, indicated at its base by the lines 51, is extinguished the smaller flames at the jets 20 serve to reignite it. An oil supply reservoir (not shown) which is connected to the oil supply pipe 15 is preferably located below the level of the burner. This arrangement can be used without employing a pump since the air under pressure passing through the burner draws a sufficient supply of oil from the reservoir. Such an arrangement overcomes the serious disadvantage of the gravity-feed systems wherein if the cut-off valves are not properly adjusted the oil supply leaks away into the furnace.

It will thus be seen that an igniter is provided which is simple in construction and which is reliable and efficient in operation.

30 What I claim, is:

1. In combination with a furnace having a wall provided with an opening therein, an ignition door unit mounted in said opening, a burner forming a part of and mounted in said door unit, connections from a source of fuel and fluid under pressure to said burner, an oil chamber in said unit having a wick therein, said wick being adjacent the outlet of said burner, said unit having an opening permitting access to said burner and said wick, and a door for closing said opening.

2. In combination with a furnace wall having an opening therein, a unit provided with a Venturi tube extending through said opening and projecting into the furnace, an atomized-liquid fuel burner for projecting a flame through said Venturi tube, said unit having an opening permitting access to said Venturi tube without disturbing same, and a door for closing said opening.

3. In combination with a furnace, means for supplying a stream of pulverized fuel into said furnace, an ignition unit in the wall of said furnace, a Venturi tube fastened to said unit, a burner mounted in said unit for projecting a flame through said Venturi tube into and at right angles to the stream of pulverized fuel, said ignition unit having an opening permitting access to said burner, and a door for closing said opening.

4. In combination with a furnace, means for projecting a stream of pulverized fuel under pressure into said furnace, a burner supported by the wall of said furnace, and means for supplying atomized fuel to said

burner, said burner having a main jet for burning a portion of the atomized fuel and projecting the flame to the stream of pulverized fuel, said burner also having a plurality of smaller jets for burning the richer portion of the atomized fuel whereby the flame from the smaller jets ignites the flame at the main jet in the event that it is extinguished by the rushing stream of pulverized fuel.

5. In combination with a furnace wall having an opening therein, a door plate mounted on the outer surface of said wall, a Venturi tube integral with said plate and extending through the opening in the furnace wall into the interior of the furnace, a sleeve integral with said plate and extending in the opposite direction from said venturi, a burner having an outlet projecting into said venturi, fuel and air supply pipes extending to said burner, a gravity closed door supported on said sleeve and means in said door for controlling the air supply passing there-through.

6. In combination with a furnace wall having an opening therein, a door plate mounted on the outer surface of said wall, a Venturi tube integral with said plate and extending through the opening in the furnace wall into the interior of the furnace, a sleeve integral with said plate and extending in the opposite direction from said venturi, a burner having an outlet projecting into said venturi, fuel and air supply pipes extending to said burner, a gravity closed door supported on said sleeve, and a chamber supported by said plate with a wick therein for projecting a flame adjacent said burner.

In witness whereof, I hereunto subscribe my name this 30th day of March, A. D. 1928.
SCHUYLER C. PAGE.

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