April 25, 1933. W. BERNZ ET AL 1,905,617

PLUMBER'S FURNACE

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Fig. 1

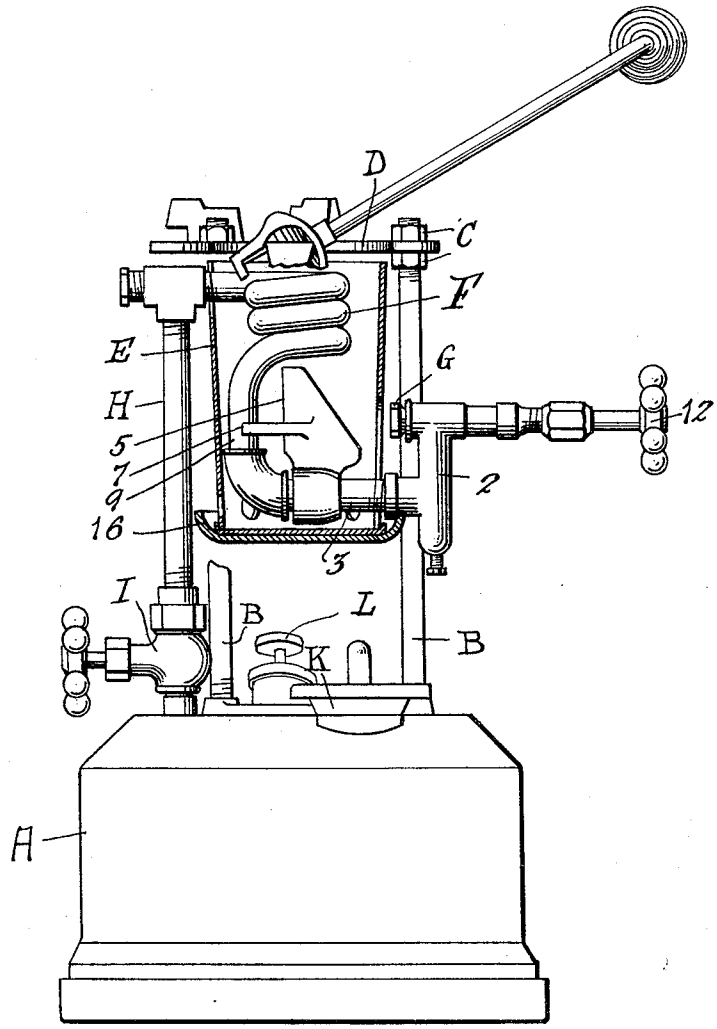
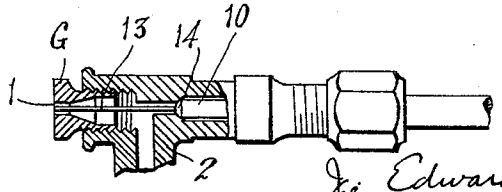


Fig. 6



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Fig. 2

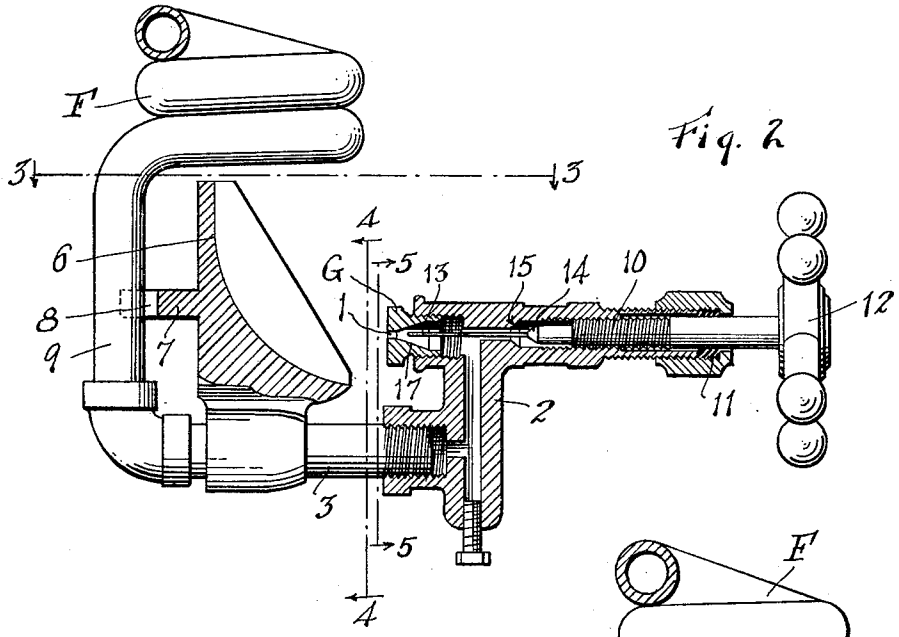
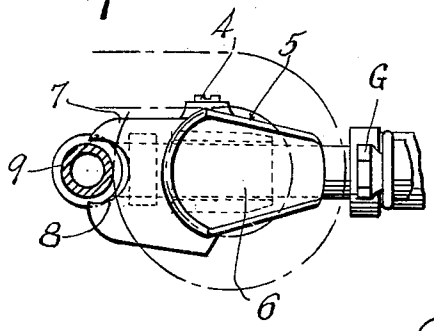


Fig. 3



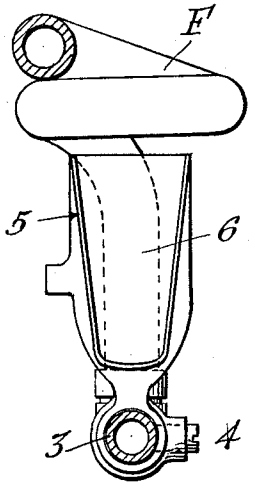
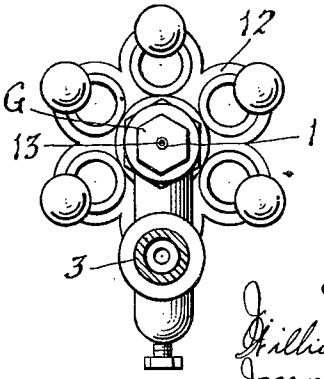


Fig. 4

Fig. 5



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UNITED STATES PATENT OFFICE

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PLUMBER'S FURNACE

Application filed December 31, 1930. Serial No. 505,783.

This invention relates in general to plumbers' furnaces, and particularly to that type of furnace which includes a tank or reservoir for liquid fuel such as gasoline or kerosene, which serves as a base for the furnace and upon which is mounted a fuel preheating coil, combustion cup, burner nozzle and a top plate or grid above the burner nozzle adapted to support an article or container to be heated, and a handle for carrying the furnace. In such furnaces the fuel supply pipe and preheating coil are generally arranged with their axes vertical, and the burner nozzle is also arranged substantially coaxially with the preheating coil. The flame is generally controlled by a valve in the fuel supply pipe, but this flame control is unsatisfactory since it does not permit of an accurate and minute variation in the size of the flame because in reducing the amount of fuel supply the fuel often is so far cut off as to completely extinguish the flame.

The objects of the invention are to provide a novel and improved furnace of this character having a vertically disposed preheating coil and combustion cup, a burner nozzle with its outlet substantially horizontally disposed, and means for deflecting the flame as it emerges horizontally from the burner nozzle into a substantially vertical path around the heating coil; to provide in such a furnace a valve for controlling the flow of fuel from the burner nozzle to vary the size of the flame, which is located at one side of the burner for convenient operation; and to obtain other advantages and results as will be more fully brought out by the following description.

Referring to the accompanying drawings, in which corresponding and like parts are designated throughout the several views by the same reference characters,

Figure 1 is a side elevation of a plumber's furnace embodying our invention, with portions broken away and shown in section for clearness in illustration;

Figure 2 is an enlarged vertical longitudinal sectional view through the flame deflector and flame control device;

Figure 3 is a fragmentary top plan view, on the line 3—3 of Figure 2;

Figures 4 and 5 are transverse vertical sectional views, on the respective lines 4—4 and 5—5 of Figure 2, and

Figure 6 is a fragmentary sectional elevation of the flame control device, showing it in the position to reduce the flame to a minimum.

For the purpose of illustrating the principles of the invention, we have shown it in connection with a furnace of known general construction, such as shown in Patent No. 1,678,316, dated July 24, 1928, said furnace comprising a tank or reservoir A which serves as a base for the furnace and from the top of which extend vertical rods or standards B to the top of which is secured as by nuts C a top plate or grid D. Beneath the top plate D is mounted a combustion cup E within which is arranged a preheating coil F to one end of which is connected a burner nozzle G, the other end of said preheating coil being connected by a fuel pipe H through a valve I to the top of the tank A. The tank is provided with a filling opening K, and an air pump L by means of which the fuel is forced through the fuel pipe H and the preheating coil F. The general combination of the parts above described is known in the art and no claim to novelty is made thereon.

As shown on the drawings, the burner nozzle G is disposed at one side of and with its fuel outlet opening 1 in substantially horizontal position with respect to the axis of the preheating coil F. This nozzle is mounted in a fitting 2 connected to the lower end of the preheating coil by a nipple 3 upon which is mounted, integrally or separably as by a set screw 4, a flame deflector 5 which consists of a spoon-shaped body having a flame deflecting surface 6 facing the outlet nozzle and concave in both longitudinal and transverse directions so as to deflect a flame from the burner nozzle vertically upward around the preheating coil F. The deflecting surface 6 also gradually increases in width or flares toward its upper end away from the nozzle, as clearly shown in Figures 3 and 4 of the drawings. Where the flame deflector 5 is made as a separate part, it preferably has a lug 7 formed with a notch 8 to receive a

vertical portion 9 of the preheating coil for holding the flame deflector in proper position.

In the fitting 2 and in axial alinement with the opening 1 of the burner nozzle is screw threaded a valve rod 10 which projects outwardly from the fitting through a gland 11 and has connected thereto an operating wheel 12. The inner end of this rod has coaxially connected thereto a wire 13 of a size to pass loosely longitudinally through the nozzle orifice 1, and movement of the valve rod toward the nozzle orifice is limited by engagement of a shoulder 14 on the valve rod with an abutment 15 in the fitting 2. With this construction, it will be observed that the wheel 12 is disposed in a convenient position for operation.

In operation of the furnace, fuel is admitted to the preheating coil by opening the valve I, and this fuel is initially preheated by a small quantity of fuel ignited in the combustion cup E. When the fuel in the preheating coil F has been properly vaporized it is ignited at the nozzle orifice 1, the wire 13 preferably having been withdrawn from the orifice by rotation of the wheel 12, as shown in Figure 2 of the drawings. The flame issuing from the orifice 1 in a horizontal direction strikes the deflecting surface of the flame deflector 6 and is directed vertically upward to the preheating coil, at the same time gradually flaring outwardly due to the upward flare or increasing width of the deflecting surface 6, as shown in Figures 3 and 4. When it is desired to reduce the extent of the flame, the wheel 12 is rotated to move the wire 13 toward the orifice 1, and the fuel supply may or may not be somewhat cut down by closing of the valve I. In this connection, it should be noted that the inner walls of the nozzle G flare inwardly away from the orifice 1, as at 17, so that the flame may be gradually decreased in size by a gradual cutting down of the amount of vapor as the wire 13 approaches the orifice 1.

It should be noted that the orifice 1 is never completely closed by the wire 13, so that should any fuel accumulate in the preheating coil F after the flame is extinguished, the vapor therefrom upon the next initial preheating of the coil can escape through the orifice to eliminate all possibility of injury to the furnace or the operator.

It will also be observed that the wire 13 also serves to clean the orifice 1 simultaneously with the movement of the wire into the orifice, and of course the wire can be used for this purpose at any time regardless of whether the flame control is desired or not.

While we have shown and described the invention as embodied in certain details of construction, it should be understood that this is primarily for the purpose of illustrating the principles of the invention, and that many modifications and changes may be made, by those skilled in the art, in the details of construction without departing from the spirit and scope of the invention.

Having thus described the invention, what we claim is:

1. A plumber's furnace comprising a fuel tank, a preheating pipe including a helical coil with its axis vertically disposed and connected at its upper end to said tank, said pipe at the lower end of said coil having a portion disposed substantially horizontally, a burner nozzle connected to said horizontally disposed portion with its axis substantially horizontal and at one side of said coil to direct a flame from the orifice horizontally beneath said coil, and a flame deflector mounted on said horizontally disposed portion of said pipe in the path of said flame to deflect the flame vertically in substantially the axial line of said coil.

2. A plumber's furnace comprising a fuel tank, a preheating pipe including a helical coil with its axis vertically disposed and connected at its upper end to said tank, said pipe at the lower end of said coil having a portion disposed substantially horizontally, a burner nozzle connected to said horizontally disposed portion with its axis substantially horizontal and at one side of said coil to direct a flame from the orifice horizontally beneath said coil, and a flame deflector mounted on said horizontally disposed portion of said pipe in the path of said flame to deflect the flame vertically in substantially the axial line of said coil, said flame deflector having a deflecting surface curved in both longitudinal and transverse directions.

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