

April 21, 1931.

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1,801,426

FURNACE BURNER

Filed June 20, 1929

Fig 1.

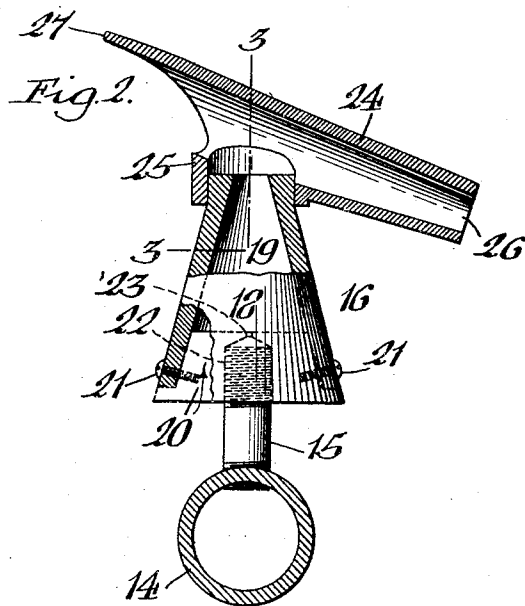
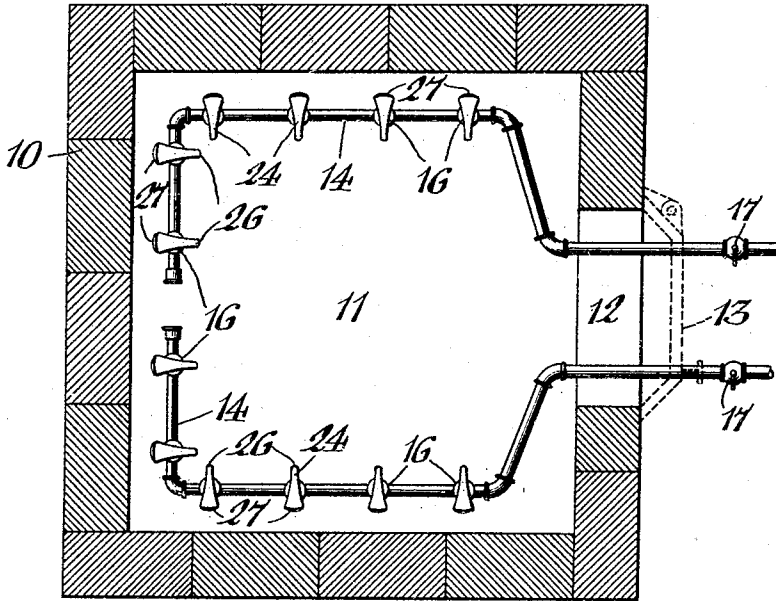
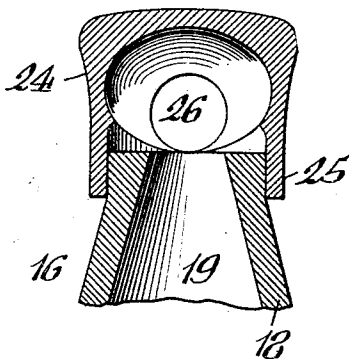


Fig. 3.



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# UNITED STATES PATENT OFFICE

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## FURNACE BURNER

Application filed June 20, 1929. Serial No. 372,365.

This invention relates to improvements in gas burners which have been particularly designed for use in furnaces, boilers and like heating appliances.

One of its objects is the provision of an efficient burner of this character which has been designed to produce a maximum amount of heat with a minimum of fuel consumption, and whose burner elements are so constructed as to produce a combustible mixture for obtaining a very high degree of it.

Another object of the invention is to provide the burner elements with combined means for introducing secondary air at the base of the flame-jets and for deflecting such jets against the furnace-walls.

In the accompanying drawings:—

Figure 1 is a top plan view of my improved burner showing the same installed in a furnace. Figure 2 is an enlarged sectional elevation of one of the burner elements. Figure 3 is an enlarged fragmentary cross section taken on line 3—3, Figure 2.

Similar characters of reference indicate corresponding parts throughout the several views.

By way of example, my improved burner has been shown in connection with a furnace 10 having a heating chamber 11 containing an opening 12 normally closed by a door 13. To facilitate the installation of the burner through the opening of the furnace-chamber, it is composed of two sections each including a pipe or manifold 14 arranged to extend along one side wall of said chamber and partially along the rear wall thereof in the manner shown in Figure 1. Rising from this pipe at suitable intervals are nipples 15 to which the upright burner-elements or jets 16 are joined. The pipes 14 are connected to the service gas supply line and are provided with controlling-cocks 17.

Each burner element preferably consists of a conical body 18 having a correspondingly shaped mixing chamber 19 whose larger or lower end constitutes an inlet for receiving the gas and air and whose smaller or upper end serves as the outlet or discharge for the combustible mixture. Fitted in the inlet end of the mixing chamber and extending dia-

metrically across the same is a bridge piece 20 which provides openings on either side thereof for the passage of primary air into said chamber, such air supply being received below the grates of the furnace and it being desirable to have both the lower draft and the chimney draft partially open at all times to obtain the best results. This bridge bar may be detachably secured to the conical body 18 by screws 21 or other suitable fastenings and it has a threaded opening 22 therein for fastening the body to the nipple 15, said opening terminating at its upper end in an orifice 23 through which the gas is admitted to the mixing chamber 19.

Applied to the discharge end of each burner element is a combined flame deflector and supplementary mixing chamber for introducing a secondary air supply into the flame issuing from the burner. This device consists of a substantially tubular body 24 disposed cross-wise of the burner element at a slight angle to its vertical axis, as seen in Figure 2, and at its underside is provided with a collar 25 for detachably connecting it to the tip of the burner element. It will be noted from Figure 1 that the secondary air supply tubes 24 are disposed at substantially right angles to the furnace-walls with their inlet ends 26 for the admission of secondary air facing downwardly and inwardly toward the center of the furnace-chamber and their outlet ends facing slightly upward and terminating in flame-deflectors 27 which project outwardly from the top and adjoining side walls of said tubes.

The secondary air tubes 24 are approximately elliptical in cross section, as shown in Figure 3, and as the mixture of gas and primary air is admitted into these tubes from the burner-bodies 18, those elements follow the curvature of the inner walls of the tubes, taking an upward and inward course and effectively commingling with the secondary air to produce a highly combustible mixture. The deflectors 27 at the discharge ends of the secondary air tubes serve to direct the flames outwardly and laterally against the furnace-walls.

I claim as my invention:—

1. A gas burner of the character described, 1443

comprising a burner-body containing a mixing chamber having an inlet for the gas and primary air at its lower end and an outlet at its upper end and a tubular member applied transversely of the outlet end of the burner-body and inclined relatively to the axis thereof, the lower end of said member forming an inlet for the admission of secondary air over the outlet end of said burner-body and its upper end terminating in a flame-deflector, the bore of said tubular member flaring outwardly from its lower inlet end to its deflector-terminating upper end.

2. A gas burner of the character described, comprising a burner-body containing a mixing chamber having an inlet for the gas and primary air and an outlet, and a tubular member disposed transversely over the outlet end of said burner-body and inclined upwardly, the bore of said member converging from its upper to its lower end, the lower end of said member at one side of the burner-body constituting an inlet for secondary air and the flared upper end of said member on the opposite side of said burner-body constituting a deflector for directing the flame laterally from the tubular member.

3. A gas burner for furnaces and the like, comprising a manifold pipe adapted for disposition in the furnace and connected with a source of gas pressure, nipples connected to said manifold, upright burner-bodies applied to said nipples and containing conical-shaped mixing chambers each having an inlet for the gas and primary air at its flared end and a mixture outlet at its contracted end, and a tubular member mounted on the outlet end of each burner-body transversely thereof and inclined relatively to the axis of its mixing chamber, the bore of said member converging from its upper to its lower end, the lower converging end of said tubular member at one side of the mixture outlet forming an inlet for secondary air and the upper flared end thereof at the other side of said mixture outlet terminating in a flame-deflector.

4. A gas burner of the character described, comprising a substantially frusto-conical burner-body containing a correspondingly shaped mixing chamber of uniform taper from end to end thereof and having an air inlet at its flared end and a mixture outlet at its converging end, a bridge bar arranged transversely of the burner-body at the flared end thereof and containing an opening for connecting said body to a gas supply nipple, and a tubular member applied to the tapered end of said burner-body transversely thereof and inclined relatively to the axis thereof, one end of said tubular member forming an inlet for secondary air over the outlet end of the burner-body and its other end terminating beyond said outlet end in an upwardly inclined flame deflector.

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