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HOT AIR FEED FOR FURNACES.

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1,254,777.

Fig. 2.

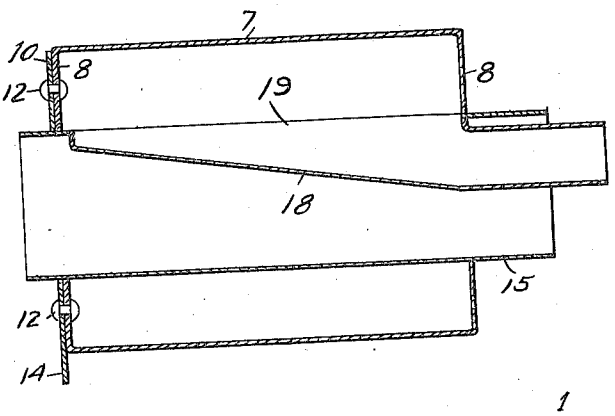


Fig. 1

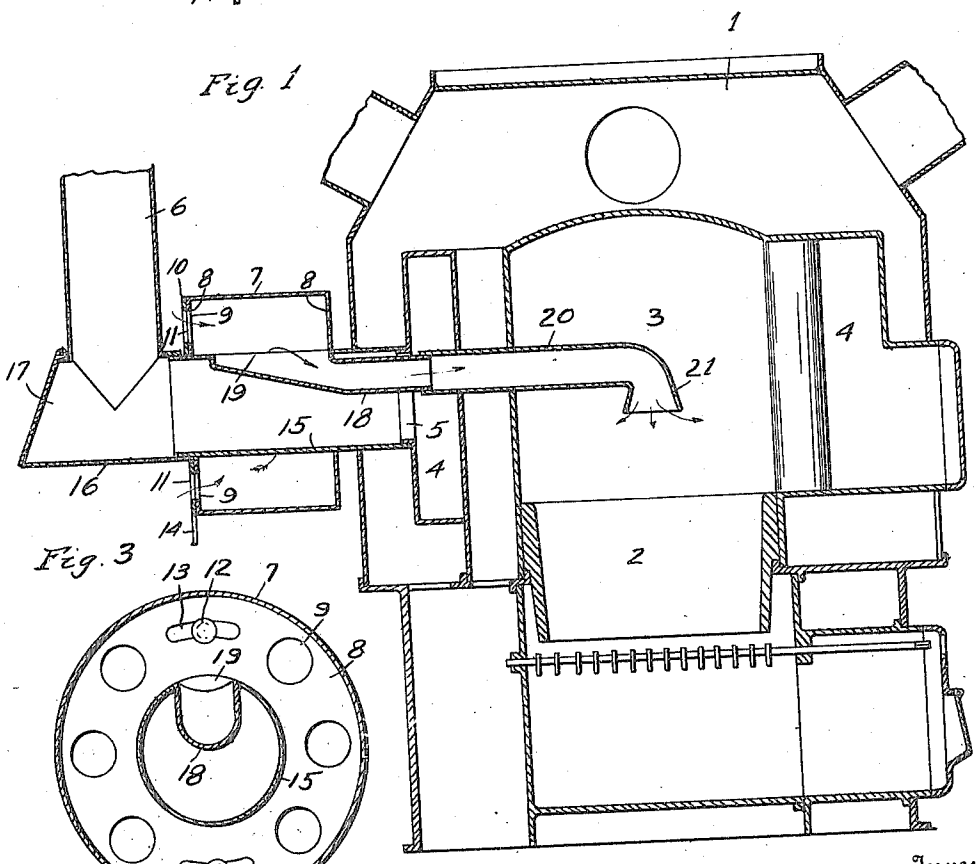


Fig. 3

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HOT-AIR FEED FOR FURNACES.

1,254,777. Specification of Letters Patent. Patented Jan. 29, 1918.

Application filed August 8, 1917. Serial No. 185,024.

To all whom it may concern:

Be it known that I, WILLIAM B. COLEGROVE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Hot-Air Feed for Furnaces, of which the following is a specification.

This invention relates to furnaces or heaters, and has for its principal object the provision of simple and efficient means for feeding into the combustion space above the fire pot a flow of warm air to intermix with and assist the combustion of the gases arising from the fuel, provision being made for preheating the air delivered into the combustion chamber by introducing it through a drum surrounding the smoke pipe, and which communicates with a passage leading through said pipe in the path of travel of the hot gases of combustion escaping therethrough, whereby the temperature of the air in its passage into the combustion chamber is raised sufficiently to prevent the chilling of the gases liberated from the fuel and insure a more complete combustion thereof. The above object is attained by the employment of the construction illustrated in the accompanying drawings, in which,

Figure 1 is a central vertical sectional view of a warm air furnace, showing the present invention consisting of a heating drum embracing a section of the smoke pipe through which a hot air feed pipe communicates with the drum and with the combustion chamber of the firepot.

Fig. 2 is a central longitudinal section through the drum detached from the furnace, showing the warm air feed pipe, a section of the smoke pipe and air damper assembled therein.

Fig. 3 is a transverse section through the drum and interior parts showing the damper controlled air inlet ports.

Referring to the parts illustrated in the drawings by the characters of reference marked thereon, 1 designates an ordinary hot air furnace having the usual fire pot 2 and combustion chamber 3 from which the hot gases of combustion escape through passages 4 and flue 5 to the smoke stack 6 of the furnace, as is common.

The present invention, which constitutes an attachment adapted to be interposed between the furnace and the smoke stack, consists of a cylindrical heating drum 7 closed at its ends by heads 8, one of which is provided with a circular series of apertures 9 for the admission of air to the interior of the drum. A circular damper plate 10, having a series of apertures 11 registerable with the apertures 9, is movably mounted upon studs or rivets 12 extended through arcuate slots 13 therein and anchored in the head of the drum, and the periphery of the damper plate is provided with a projecting handle 14 by means of which it may be shifted to vary the areas of the registering apertures and control the passage of air into the drum.

Spaced concentrically within the drum, and extending axially through the heads 8 thereof, is a sleeve or pipe section 15 which is adapted to receive at one end the flange of the flue 5 of the furnace, and may be connected at its opposite end in any suitable manner to the smoke stack 6, preferably by means of the usual T-shaped fitting 16 having a check draft damper 17, as shown in Fig. 1. This pipe 15, which forms a section of the smoke pipe through which the burned gases escape from the furnace, has mounted therein a warm air flue 18, one end of which communicates with the interior of the drum 7 through an elongated aperture 19 formed in the upper wall of the pipe 15, and the opposite end of said flue extends through the inner end of said pipe and receives one end of a feed pipe 20 which extends into the combustion chamber 3 of the furnace and terminates centrally therein above the fire pot 2 in a downwardly turned outwardly flared discharge nozzle 21.

It will now be understood that the draft created through the combustion chamber by the escaping products of combustion through the smoke pipe will cause a current of air to be drawn through the air inlet apertures 9 into the heating drum where it will become heated by contact with the pipe 15 through which the burning gases escape to the smoke stack, and from the drum the heated air will be drawn through the flue 18 and feed pipe 20 from which it will discharge at the nozzle 21 into the combustion chamber directly over the center of the mass of burning fuel in the fire pot, as indicated by arrows in Fig. 1. The air thus introduced into the combustion chamber will intermix with the gases liberated from the fuel and form a combustible mixture which will assist in the burning of the gases within the combustion chamber before escaping into the smoke

stack. Owing to the fact that the air drawn in through the drum is subjected to the intense heat of the embraced section of the smoke pipe around which it circulates, said air will become heated to a comparatively high temperature and consequently expanded, and because of the greater density and pressure of the exterior air will be caused to discharge with considerable force through the nozzle of the feed pipe in a manner to supply a blast of heated air at such temperature as not to materially cool the gases in the combustion chamber, thus insuring a more nearly perfect commingling of the air and gases because of their relatively uniform temperatures, whereby the combustion of the gases is greatly facilitated and a more complete consumption of the calorific properties of the fuel is effected.

I claim:

1. The combination with a combustion chamber having a smoke pipe communicating therewith, of an air heating drum surrounding said pipe and having an air inlet opening therein, and a hot air feed pipe within said smoke pipe and having its inlet end in communication with said drum laterally through the wall of said smoke pipe and having its outlet end extended through the inlet end of said smoke pipe and terminating in a discharge nozzle within said combustion chamber.

2. The combination with a combustion chamber having a smoke pipe communicating therewith, of an air heating drum concentrically embracing said pipe and having damper controlled air inlet openings in one end thereof, a hot air flue within said smoke pipe and communicating with said drum through a lateral opening in the wall of said pipe, said flue extending at one end through the inlet end of said smoke pipe, and a feed pipe extending from said flue and terminating in a downwardly turned discharge nozzle centrally within said combustion chamber.

3. A hot air feed for a combustion chamber comprising a section of smoke pipe adapted for connection with said chamber, an air heating drum closed at its ends and receiving axially therethrough said smoke pipe, said drum having a circular series of damper controlled air inlet ports in one end thereof, a hot air flue arranged longitudinally within said smoke pipe and in communication laterally through the wall thereof with the interior of said drum and having its outlet end within the inlet end of said smoke pipe, and a feed pipe extension for said flue having a nozzle adapted to discharge into said combustion chamber.

In testimony whereof I sign this specification.

WILLIAM B. COLEGROVE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."