

A. C. FRAAS.

FURNACE.

APPLICATION FILED JAN. 6, 1917.

1,293,074.

Patented Feb. 4, 1919.

2 SHEETS—SHEET 1.

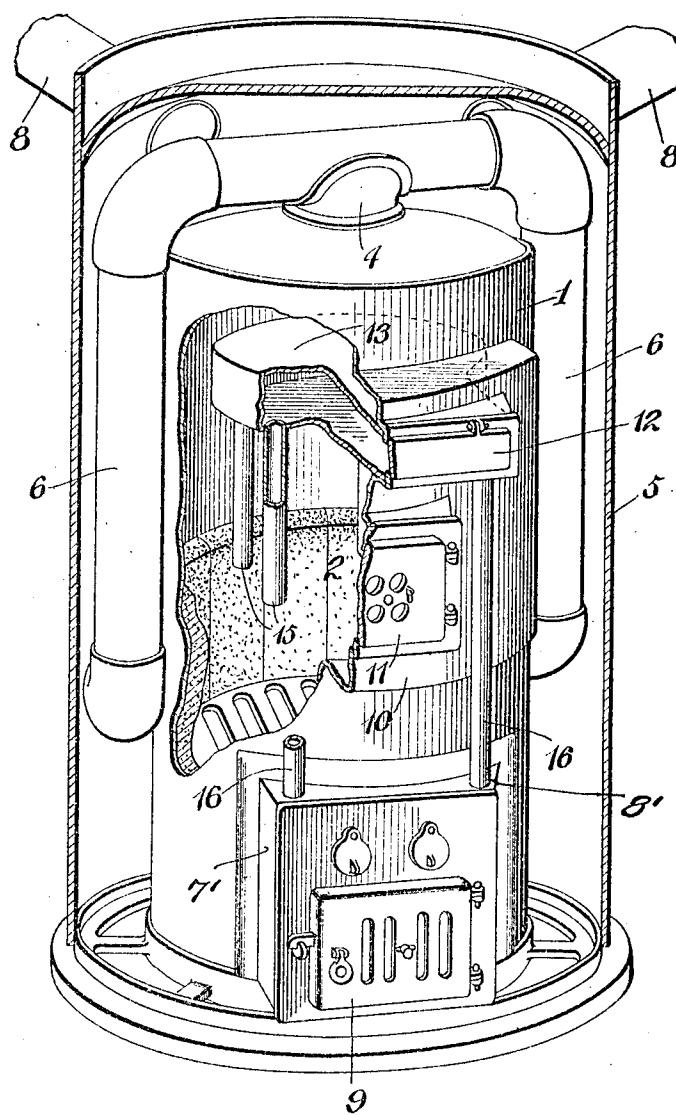


Fig. 1.

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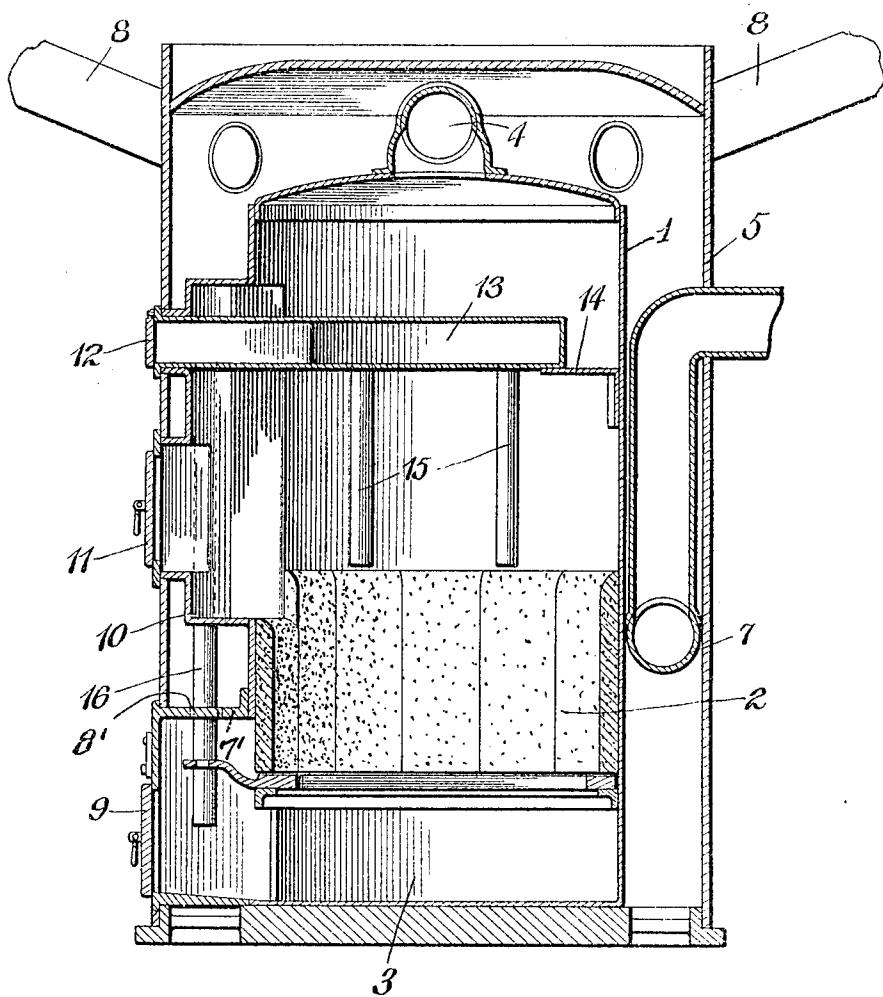
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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FURNACE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, AUGUST C. FRAAS, a citizen of the United States, residing at South Milford, in the county of Lagrange and State of Indiana, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to heating furnaces and has for its object the provision of simple and efficient means for promoting combustion and reducing the quantity of unconsumed matter which tends to pass off through the chimney.

In furnaces as now ordinarily constructed, a large percentage of volatile matter contained in the coal escapes through the smoke flue or chimney because the furnace is not supplied with sufficient oxygen to support combustion. To prevent the loss of heat units, due to the escape of this volatile matter, is the primary object of my invention and the object is attained by means, one form of which is illustrated in the accompanying drawings in which—

Figure 1 is a perspective view of a furnace partly broken away having my improvements applied thereto;

Fig. 2 is a vertical section of the furnace with the improved apparatus in position.

The furnace body may be of any preferred dimensions and is preferably cylindrical in form, being provided with a heating dome 1, fire pot 2 and an ash pit 3 below the same, as will be readily understood. A smoke flue 4 leads from the top of the heating dome toward both sides of the same whence its branches pass downwardly between the heating dome and the casing 5, as clearly shown. From the lower ends of the branches 6 of the smoke flue a curved branch flue 7 extends around the rear of the furnace body and communicates with the chimney, as will be readily understood. Hot air flues 8 lead from the casing 5 to convey the heated air to the different rooms of the building in the usual manner.

The ash pit 3 is provided with an extension 7' having spaced openings 8' formed therein and a door 9 forms a closure for the outer end of the extension as shown. The body of the furnace is provided with an extension 10 in which the fuel door 11 is mounted and in which, near the upper end thereof, is a draft door 12. This draft door

12 forms a closure for the neck portion of a flat horizontally disposed drum or air chamber 13 which is disposed within the heating dome above the fire box and may have its inner rear end supported in any convenient manner, as by a bracket 14, as will be readily understood. The front portion of this drum or air chamber extends through the front wall of the furnace body and through the casing 5 and is partly supported by said casing and wall, the draft door 12 being disposed in front of the casing, as will be readily understood and as is shown in Fig. 2. Communicating with and leading downwardly from the air chamber or drum 13 are a plurality of tubes 15 which have open ends and have their lower ends disposed within or immediately adjacent the fire box. Other similar tubes 16 lead downwardly from the forward extension of the drum or chamber at the sides of the fuel door 11 and have their lower ends passed through the openings 8' in the extension 7' of the ash pit and extended below the grate so that they will open into the ash pit.

The fire is kindled in the fire box in the usual manner and the draft door 12 may be opened, thereby admitting air to the chamber or drum 13 and thence through the tubes 15 to the top of the fuel in addition to the supply entering through the ash pit door 9 in the usual manner. Air from the drum or chamber 13 will pass downwardly through the flues 15 to the fire box and be discharged onto the fire so that an abundant quantity of oxygen will be delivered and the loss of volatile matter will be minimized. As the fire gains in intensity, the tubes 15 which are exposed directly to the same, will become heated and, consequently, the air flowing through them will be raised in temperature so that the fire will not be held back and checked by the admission of cold air thereto, as is now generally the case. If the ash pit door 9 be closed and the draft door 12 left open, the admission of air will then occur only through the draft door and, consequently, the fire will be checked but combustion supported sufficiently to prevent the fire dying. The air flowing through the tubes 16 will also be raised in temperature inasmuch as it will be exposed to the action of the heated air in the space between the furnace body and the casing 5 and also because they are located close to the wall of 110

the furnace body. Inasmuch as the furnace body is generally constructed of plate metal while the doors and their mountings are constructed of cast metal, the walls of the furnace body become highly heated and radiate heat which acts upon the tubes 16. The air currents rising from the fire box, moreover, will be deflected by striking the under side of the air drum or chamber 13, and, consequently, will be caused to flow around the same instead of passing directly to the smoke flue 4 and the upper portion of the heating dome will, therefore, be subjected to the influence of these heated currents for a longer period than is ordinarily now the case.

With the door 12 closed and the damper in the draft door 9 open, the body of air entering through the draft door to the ash pit will be divided, part of the air passing through the combustion chamber and the remainder passing through the pipes 16, the air drum 13 and pipes 15 to the combustion zone above the fuel thereby effecting the combustion of gases rising from the fuel.

My device is exceedingly simple in the construction and arrangement of its parts and may be readily applied to any furnace now in use. By its use, combustion is effected on the top of the body of fuel as well as through the said body and close to the grate bars so that the smoke and gases which ordinarily pass off unconsumed from the top

of the fuel bed will be burned and an economy of fuel thereby effected.

Having thus described the invention, what is claimed as new is:

The combination with a furnace including a casing, fire box, ash pit and heating dome, the ash pit being provided with an extension having spaced openings formed therein, of a flat horizontally disposed air drum arranged within the heating dome directly above the fire box and spaced from the top and side walls of said dome, the air drum being provided with a horizontal neck portion extending through the side walls of the dome and casing and having its outer end open, a door forming a closure for the opening to the neck portion of the air drum, a plurality of tubes arranged within the combustion chamber and having their upper ends communicating with the interior of the air drum and their lower ends terminating at a point above the top of the fire box, and other tubes disposed between the exterior of the furnace and the casing and arranged one at each side of said door, the last mentioned tubes having their upper ends communicating with the interior of the neck of the air drum and their lower ends extending downwardly through the openings in the ash pit extension to a point below the top of the ash pit.

In testimony whereof I affix my signature.

AUGUST C. FRAAS. [L. s.]

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