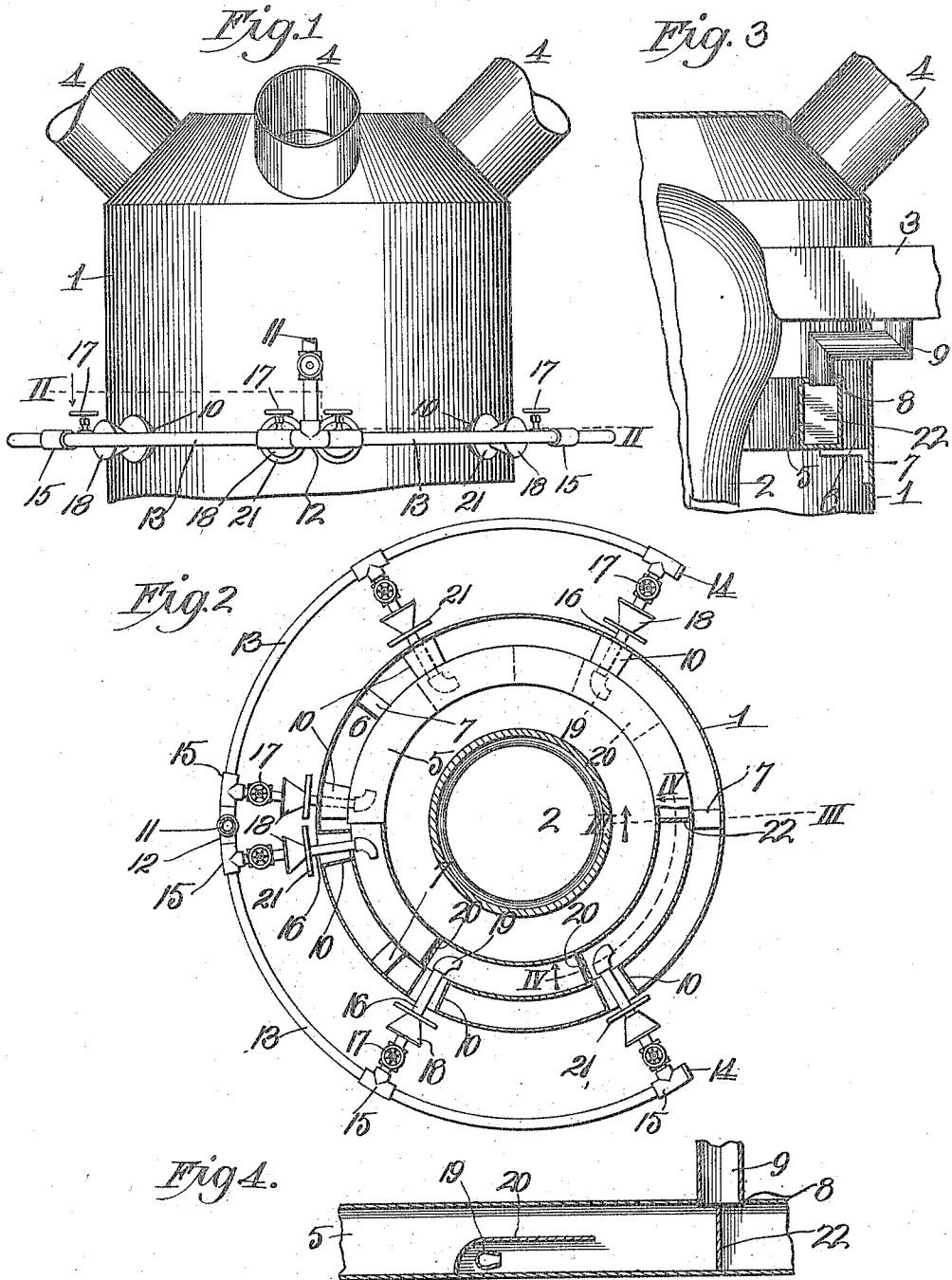


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GAS BURNING ATTACHMENT FOR FURNACES.
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UNITED STATES PATENT OFFICE.

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GAS-BURNING ATTACHMENT FOR FURNACES.

948,133.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK J. COYLE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Gas-Burning Attachments for Furnaces, of which the following is a specification.

This invention relates to heating furnaces, and my object is to produce a gas-burning attachment which can be applied to any of the approved types of coal-burning furnaces to cooperate in the production of hot air for distribution to the rooms or apartment to be heated or which can be used alone for heating air for such purpose.

A further object is to produce an attachment in which a plurality of burners may be efficiently operated in a single combustion box to effect the uniform or equitable heating of such box or in which any one or more of such burners may be operated independently of the others.

A still further object is to produce an attachment of the character outlined of simple, strong, durable and inexpensive construction.

With these objects in view the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawing, in which—

Figure 1, is a front view of a part of a furnace equipped with a gas-burning attachment embodying my invention. Fig. 2, is a horizontal section of the same on the line II—II of Fig. 1. Fig. 3, is a vertical section on the line III—III of Fig. 2. Fig. 4, is a section on the line IV—IV of Fig. 2.

In the said drawing, 1 indicates the casing or shell of a hot air furnace of any suitable or preferred type.

2 is the inner shell within which coal or other fuel is adapted to be burned in the usual manner.

3 is the smoke flue leading from the inner shell through the outer shell or casing to the chimney, not shown, and 4 are the hot air distributing pipes leading from the upper part of the outer shell or casing.

5 is a circular box arranged horizontally in the hot air chamber 6 between the inner and outer shells and supported upon brackets 7 secured to the outer shell or casing or in

any other suitable manner. In the vertical plane of the smoke flue the combustion-box is provided in its upper side or top with an opening 8, and connected to the same is a combustion tube 9 leading out through the outer shell or casing and connected at its upper end to the smoke flue 3 and at suitable points communication with the outside air is established with the combustion box by means of air tubes 10, two of said air tubes being arranged closely together and almost diametrically opposite tube 9, and the remaining tubes 10 suitable distances apart to the right and left of said first-named pair of tubes 10.

11 is a valve-controlled gas-supply pipe leading from a meter, not shown, located at any suitable point, and equipped at its discharge end with a T-coupling 12 from which extends in opposite directions a pair of arcuate pipes 13 in the horizontal plane of tubes 10 and spaced a suitable distance outward from and extending concentrically of the casing or shell 1, the outer extremities of said pipes being closed by caps 14 or otherwise.

15 are radially-arranged T-couplings forming joints of pipes 13 and provided with burners 16, extending therefrom through the adjacent tubes 10, said burners being equipped near their outer ends with valves 17 and air mixers 18, and at their inner ends within the combustion-box with elbow tips 19, the tips at opposite sides of the vertical plane of coupling 12 and tube 9 being disposed to discharge gas toward the adjacent ends of pipes 13, and each burner except the two central or front ones, is protected from the burner in front of it by a shield or guard 20, so that the products of combustion from one burner shall be compelled to pass the next burner to the rear, without mixing with and deteriorating the gas discharged from another, as I have found in practice that it is impossible to operate a plurality of burners in a box where the products of combustion from one mixes with the gas issuing from another.

It is essential that the burners be distributed at suitable intervals within the box in order that the latter may be uniformly heated, as otherwise it will be impossible to effect an equitable heating of the air which passes up through chamber 6 from the inlet duct, not shown because used in all hot air fur-

naces, to the distributing pipes 4, and because of the employment of a plurality of burners in the same combustion box, arises the necessity for shielding or guarding one burner from another, it being noticed by reference to Fig. 4, that the shields or guards project a sufficient distance beyond their associated burner tips to insure the complete consumption of the gas issuing from said tips before the products of combustion can mix with the corresponding products from the burner in front.

The burners are controlled by their individual valves, so that any one or more of them may be operated and the gas issuing from any particular burner is ignited by introducing a burning match or taper through the associated tube 10, which is of sufficient size to permit the burners to be readily placed in or removed from position and furthermore cooperate with the mixers in supplying ample air to support combustion, though the tubes may be closed at their outer ends when not in use by the proper adjustment of collars 21, slidably mounted on the burners.

When the burners are in operation the products of combustion travel through the combustion-box in both directions and are deflected by the vertical partition 22 in the rear part of the same, up through the tube 9 from which they pass through smoke flue 3 to the chimney, the air as hereinbefore suggested which passes up through the outer shell or casing being heated to the requisite degree by contact with the combustion box and then passes through the distributing tubes 4. In the event that the gas pressure falls so low that it is impossible to generate the required heat, coal or other fuel may be burned within the inner shell 1 and cooperate in the heating of the air with the gas-burning attachment. It will thus be seen that the gas-burning and coal-burning parts of the furnace may cooperate together or may be operated independently of each other and that a furnace of this character will prove exceedingly desirable, and it will be further noted that the air heated by the gas-burning attachment is not contaminated by the fumes from the burning gas and is therefore distinguished from an attachment now on the market which is located between the outer and inner shells of the furnace the fumes mixing with the air which passes to the rooms.

From the above description it will be apparent that I have produced a gas-burning attachment for heating furnaces possessing the features enumerated as desirable and I wish it to be understood that I do not desire to be restricted to the exact details of construction shown and described as obvious modifications will suggest themselves to one skilled in the art.

Having thus described the invention what I claim as new and desire to secure by Letters-Patent, is;

1. The combination with a furnace having a hot air chamber and a smoke flue extending through but not communicating with said chamber, of a combustion box arranged within said chamber and extending around the body portion of the furnace, a pipe extending from the combustion box to the smoke flue, a plurality of burners arranged in the combustion box at different points, and shields or guards within the box for certain of said burners, said shields or guards extending upward from the bottom of the box forward of the burners and then in a substantially horizontal direction and terminating beyond the tip ends of said burners, the substantially horizontal portion of the shields or guards being below and spaced from the upper part of the box.

2. The combination with a furnace having a hot-air chamber and a smoke flue, of an annular combustion box arranged within said chamber and encircling the body portion of the furnace below the smoke flue, a pipe extending upward from the combustion box to the smoke flue, a plurality of burners arranged in the combustion box at different points, and shields or guards within the box for certain of said burners, said shields or guards extending upward from the bottom of the box forward of the burners and then in a substantially horizontal direction to a point some distance beyond the tip ends of the burners.

3. The combination with a furnace having a hot-air chamber and a smoke flue, of an annular combustion box arranged within said chamber and encircling the body portion of the furnace below the smoke flue, a pipe extending upward from the combustion box to the smoke flue, a plurality of burners arranged in the combustion box at different points, shields or guards within the box for certain of said burners, said shields or guards extending upward from the bottom of the box forward of the burners and then in a substantially horizontal direction to a point some distance beyond the tip ends of the burners, and a vertical partition extending upward from the bottom of the box to the lower end of the pipe connected to the smoke flue.

4. The combination with a furnace having a hot air chamber and a smoke flue extending through but not communicating with said chamber, of a combustion box arranged within said chamber and extending around the body portion of the furnace, a pipe extending from the combustion box to the smoke flue, a plurality of burners arranged in the combustion box at different points, supply pipes for the burners extending into the furnace, tubes loosely surrounding said

supply pipes and connecting the interior of the combustion box with the external atmosphere, adjustable collars mounted on said supply pipes to cover or uncover the outer
5 ends of said tubes, and shields or guards within the box for certain of said burners, said shields or guards extending upward from the bottom of the box forward of the burners and then in a substantially horizontal direction and terminating beyond the
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tip ends of said burners, the substantially horizontal portion of the shields or guards being below and spaced from the upper part of the box.

In testimony whereof I affix my signature 15
in the presence of two witnesses.

FRANK J. COYLE.

Witnesses:

H. C. RODGERS,
G. Y. THORPE.