

Jan. 15, 1929.

1,699,433

U. N. HOWELL

FURNACE

Filed Aug. 19, 1926

2 Sheets-Sheet 1

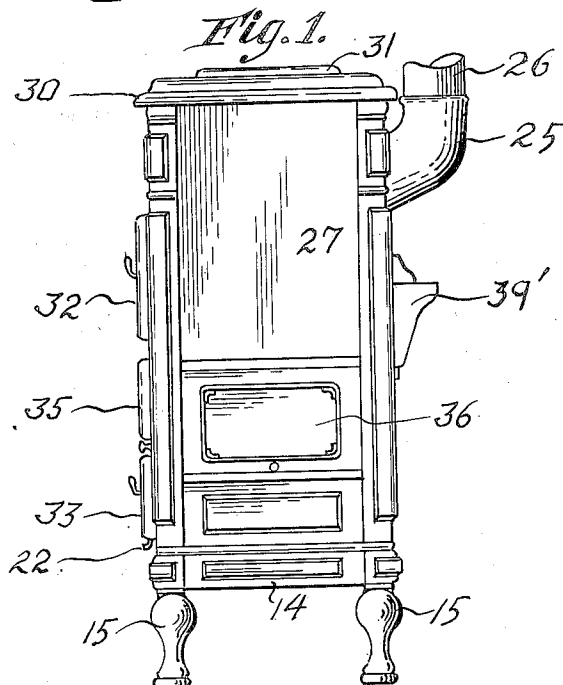
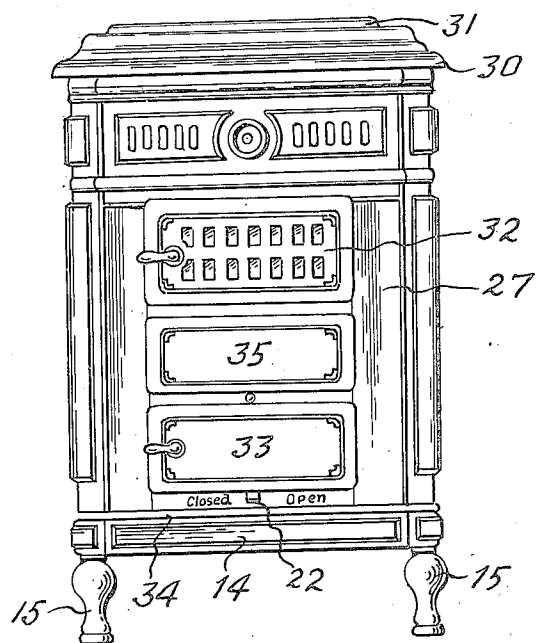


Fig. 2.

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2 Sheets-Sheet 2

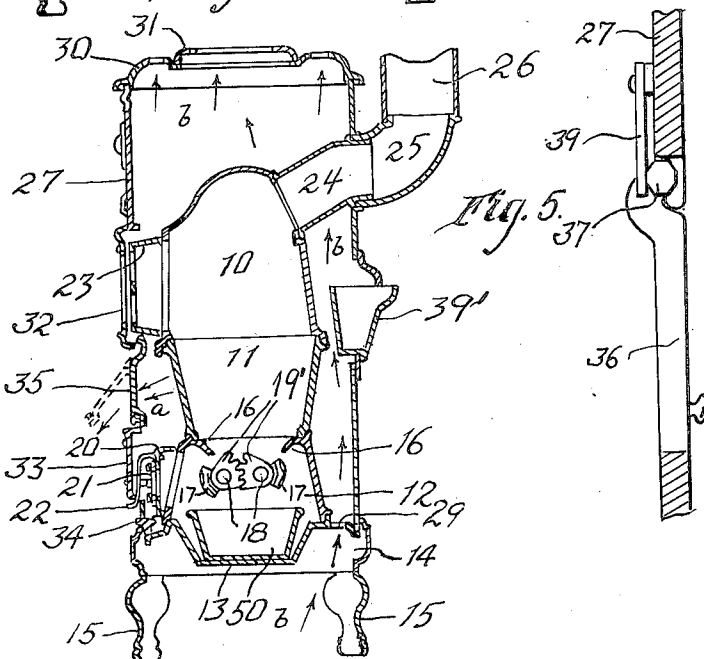
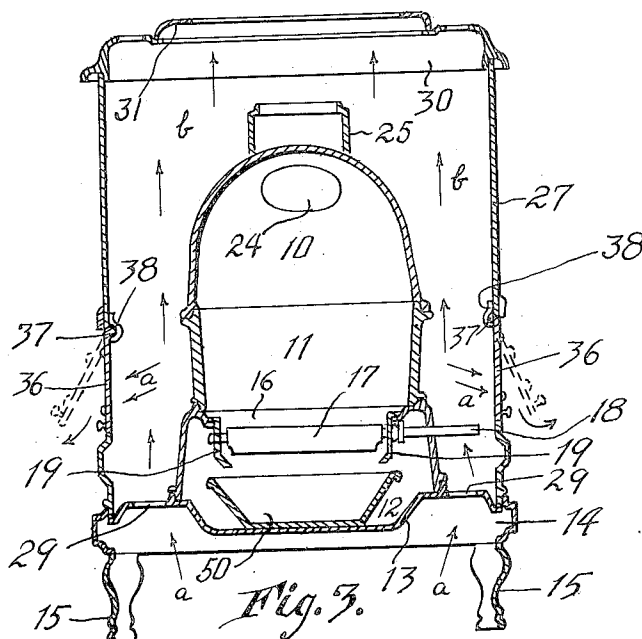


Fig. 4.

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FURNACE.

Application filed August 19, 1926. Serial No. 130,313.

This invention relates to improvements in furnaces of that type which are provided with an ornamental outer casing to impart the appearance of a cabinet structure and which can be placed in a living or other room as a piece of furniture. The outer casing and the air space between the two casings serve to insulate the heat so that the furnace can be placed in close proximity to woodwork and other inflammable material. Ordinarily, in furnaces of this type, the outer ornamental casing is utilized in conjunction with the inner casing to form a conduit through which the air of the room circulates to be heated by contact with the heated wall of the inner casing. In such a construction the heat is so insulated that but little heat is projected by radiation outside of the furnace. As a consequence the heat from the combustion cannot be fully realized until practically all of the air in the room has been heated to the desired degree.

The purpose of the present invention is to provide a furnace of the foregoing type with means whereby the instant effect of the radiant heat can be realized without interfering with the operation of the furnace as a convective heater. This purpose is accomplished by providing the outer casing with controlled openings opposite to the fire pot so that by uncovering these openings the radiant heat can be projected to the exterior of the furnace. By closing these openings the projection of the radiant heat to the exterior of the furnace is cut off and it heats by convection of the air. Even while the openings are unclosed the convection continues, but not so strongly as it would with the openings closed.

The invention also has for its object certain improvements in the details of construction hereinafter particularly described and pointed out in the claim.

In the drawings; in which like reference characters designate corresponding parts,
Figure 1 is a front elevation of a furnace embodying the invention.

Fig. 2 is a side elevation.

Fig. 3 is a vertical cross section.

Fig. 4 is a vertical longitudinal section, at right angles to that shown in Fig. 3.

Fig. 5 is a detail view showing one of the hinge connections for the doors.

Referring to the drawings in detail, the inner casing, which is in a general way of

rectangular formation, includes the walls of the combustion chamber or dome 10, the fire pot 11 and the ash box 12 in superimposed relation. The wall of the ash box is seated on the base plate 13, which also forms the bottom of the ash box. The base plate is mounted at its edges in the horizontal base frame 14 supported at its corners by the legs 15. Inwardly declined from the upper edges of the front and rear walls of the ash box are the ash chutes 16 at the lower end of the fire pot. Between these ash chutes are mounted the grate bars 17 carried by the shafts 18 journaled in the hangers 19 depending from flanges at the upper ends of the side walls of the ash box. On the shafts 18 are fixed the meshed cogs 19', and one of the shafts extends through the wall of the ash box so that it can be engaged by a shaking implement. By rocking the extended shaft, both grates are rocked simultaneously through the engaged cogs 19'. In the front wall of the ash box is an opening provided with a door 20 having air inlets controlled by a slide 21. A lever 22 pivoted at one end to the door and connected at an intermediate part with the slide is operative to move the slide to control the air inlets.

The combustion chamber or dome 10 has in its front wall a feed opening for the introduction of fuel through the chamber into the fire pot 11. This opening is controlled by a door 23 hinged on a vertical pivot (not shown). Extending from the rear upper wall of the combustion chamber is the uptake 24 leading through the elbow 25 into the chimney pipe 26.

The outer casing 27 is also of a generally rectangular formation and is spaced apart from the inner casing. The outer casing is seated at its lower end on the base plate 13, which closes the lower end of the annular space between the two casings, except for the openings 29 through the plate and forming communication between the annular space and the exterior of the furnace. On the upper end of the outer casing is seated the rim 30 and on the latter is the loose cover 31. Both the rim and plate have openings to provide communication for the upper part of the outer casing to the exterior air. Through the rear wall of the outer casing extends the uptake 24 from the combustion chamber. In the front wall of the outer casing is an opening corresponding with the feed opening con-

trolled by the door 23 in the front wall of the combustion chamber. A panel 32 is attached to the door 23 and serves to close the opening in the outer casing when the door is closed.

5 In the door and panel are coincident windows closed with mica sheets so that the interior of the combustion chamber can be observed when the door is closed. In the lower front wall of the outer casing is an opening opposite to

10 the door 20 of the ash tray and attached to the door is a plate 33 to close the opening when the door is closed. The lower end of the operating lever 22 for the slide 21 is curved outwardly beneath the lower edge of the plate

15 33 to an accessible position for operation. A sill 34 is mounted in the horizontal base frame 14 to extend along the lower part of the opening for the door 20, to protect the edges of the metal against impact with the ash pan

20 50 when the latter is removed or returned to the ash box.

In the front wall of the outer casing and directly opposite to the fire pot 11 is an opening provided with an imperforate door 35

25 hinged on horizontal pivots (not shown) at its upper edge to the outer casing above the opening so that it can be turned outwardly and upwardly. In the opposite side walls of the outer casing and directly opposite to the

30 fire pot are openings provided with imperforate doors 36 also hinged at their upper edges by horizontal pivots 37 working in bearing clips 38 secured to the inner side of the outer casing. Friction steel spring bars 39 are

35 mounted in the hinge connections of the doors 35 and 36 and operate to hold the door in any position to which they may be raised. The spring bars 39 are bolted to the casing wall and bear under pressure on the horizontal

40 pivots 37 fast on the doors. When the doors are turned the frictional engagement between the spring bars and the pivots hold the doors in their adjusted positions. The doors and the openings controlled by them are rectangular and have considerable area, those on the

45 sides extending almost entirely across the sides and the one in front extending a considerable distance across the front. The areas of the openings controlled by the doors 35 and

50 36 are approximately coextensive with the areas of the walls of the fire pot opposite to said openings. When these three doors are open much of the surface of the fire pot 11 is exposed so that the direct heat radiations from

55 the wall of the pot are projected through the openings to the exterior of the furnace, as in-

dicated by the arrows *a* in Figs. 3 and 4. By inclining the doors as indicated by dotted lines in Fig. 3, the heat rays can be directed downwardly. By means of these openings

60 and doors the radiant heat can be utilized directly. The advantage of this is, that should the room be cold and warmth desired before the air of the whole room is heated by convection, the doors can be opened and the space

65 close to the furnace will be heated to provide the desired higher temperature long before the more remote parts of the room are heated to the required degree.

Under normal conditions and after the

70 room is once warmed, the doors 35 and 36 are closed and the air of the room circulates through the space between the two casings to be heated by contact with the wall of the inner casing. The base plate 13 is provided

75 with openings 29 and air passing beneath the bottom at the furnace passes through these openings and ascends through the annular space between the casings and escapes through the openings in the rim 30

80 and the cover 31, as indicated by the arrows *b* in Figs. 3 and 4.

In the rear wall of the outer casing is mounted the water receptacle 39' to humidify

85 the air passing through the furnace.

What I claim is:

A furnace comprising inner and outer casings generally rectangular in formation, said casings being spaced apart to provide therebetween an air-passage leading from beneath

90 the furnace through the top thereof, said inner casing including the walls of a fire pot and said outer casing having a plurality of its side walls provided with rectangular openings directly opposite the fire pot to permit

95 the direct emission of heat from the walls of the fire pot through said openings to the exterior of the furnace, said openings having areas approximately coextensive with the areas of the walls of the fire pot opposite to

100 said openings, rectangular imperforate doors hinged at their upper edges to the exterior walls of the outer casing above the openings therein to close downward over said openings,

105 there being a door to each opening, and friction means connected with each door for holding the door in adjusted relation to its opening to reflect the heat from the opening outwardly and downwardly with relation to the

110 furnace.

In testimony whereof I affix my signature.
U. N. HOWELL.