

(No Model.)

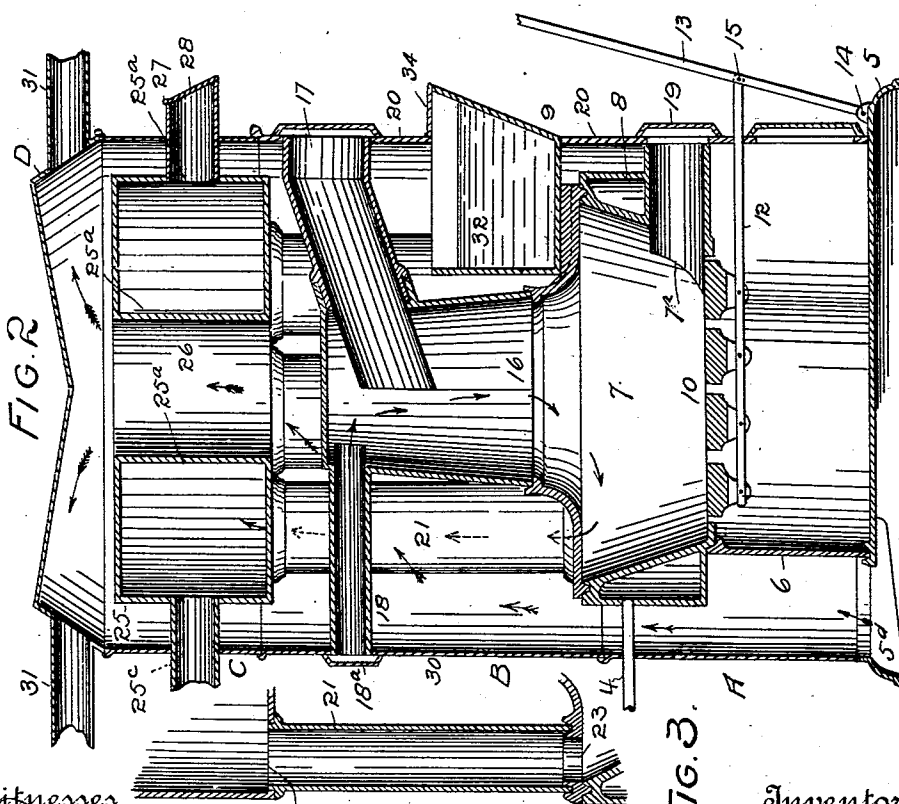
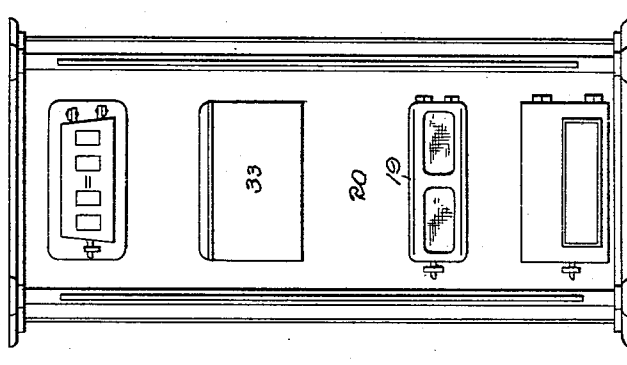
2 Sheets—Sheet 1.

C. S. FAUROT.
HOT AIR FURNACE.

No. 563,243.

Patented June 30, 1896.

FIG. 1



Witnesses

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FIG. 3.

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(No Model.)

2 Sheets—Sheet 2.

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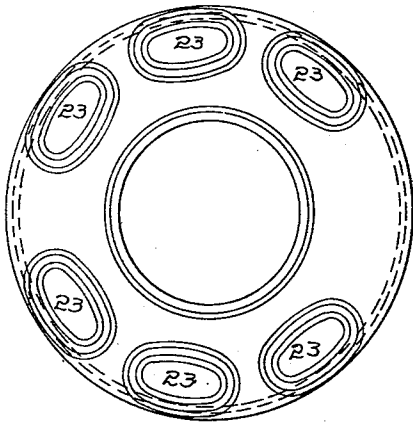


FIG. 5.

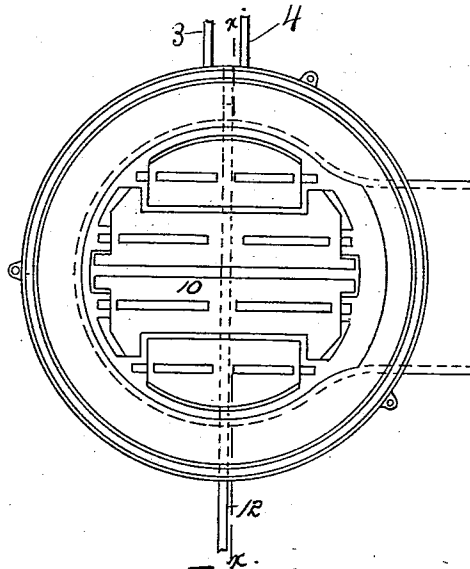


FIG. 4.

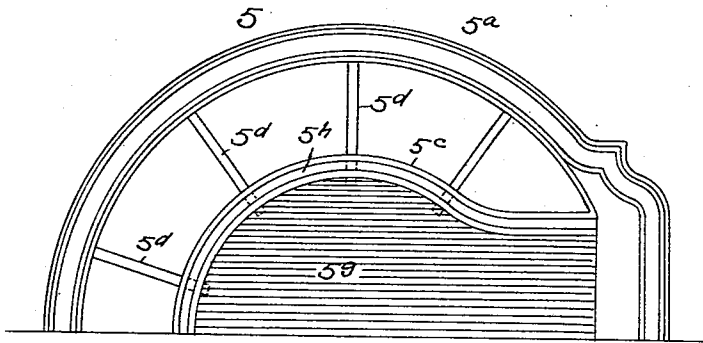


FIG. 6.

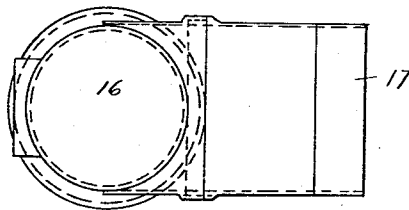


FIG. 7.

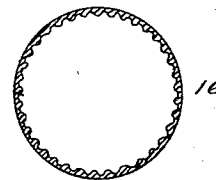


FIG. 8.

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UNITED STATES PATENT OFFICE.

CHARLES S. FAUROT, OF DENVER, COLORADO.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 563,243, dated June 30, 1896.

Application filed July 16, 1895. Serial No. 556,200. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. FAUROT, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Hot-Air Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in hot-air furnaces.

The objects I seek to accomplish by my improved furnace are perfect combustion and a maximum efficiency from a minimum supply of fuel; and to these ends the invention consists of the features hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a front elevation of the cast front of the furnace on the line X X of Fig. 4. Fig. 2 is a vertical section taken through the complete furnace. Fig. 3 is a fragmentary section taken through one of the flues leading from the fire-pot to the radiator or drum. Fig. 4 is a top or plan view of the fire-pot section. Fig. 5 is a similar view of the top of said section. Fig. 6 is a top view showing half of the base-ring. Fig. 7 is a top view of the fuel-magazine and feed-chute. Fig. 8 is a horizontal or cross section taken through the fuel-magazine.

Similar reference-characters indicate corresponding parts in the views.

Let the numeral 5 designate the base-ring, which is cast and shaped substantially as shown in Fig. 6. This ring comprises the outer rim 5^a, the inner rim 5^c, the spider-arms 5^d, connecting the two rims, and the central bed-plate 5^e, forming the bottom of the ash-pit. The vertical wall 6 of the ash-pit engages a groove 5^h in the rim 5^c of the base-ring. Above the ash-pit, and supported by the wall thereof, is the fire-pot section 7, surrounded by the water-jacket 8. This jacket is utilized for hot-water heating. Hence the con-

struction illustrated in Fig. 2 comprises a combination hot-air and hot-water furnace. This water-jacket may be employed or not, as desired.

To the fire-pot section is applied the top 9, having a depending circumferential tongue engaging a counterpart groove formed in the wall of the fire-pot section. In the bottom of the fire-pot section is located the grate 10, composed of movable sections whose extremities are trunnioned in suitable sockets. This grate is controlled through the instrumentality of a bar 12, extending beneath the sections and pivotally attached to each of them, and an upright lever 13, fulcrumed at 14 and pivoted to the bar at 15.

Located above, and engaging the top of the fire-pot section, is the fuel-magazine 16, which rests upon an interiorly-projecting ledge, and is held in place by an upwardly-projecting circumferential flange formed on said top. This magazine is open at the bottom and closed at the top. To one side of it is attached a chute 17, through which the necessary fuel is fed to the fire-pot.

Attached to the upper part of the fuel-magazine, and communicating therewith, is a draft-flue 18. The inner surface of the fuel-magazine is longitudinally ribbed or corrugated to allow the air entering through the draft-flue and feed-chute to pass freely downward into the fire-pot. It must be understood that this is what may be termed a "downdraft" furnace, since combustion is mainly supported by air entering at the upper part of the fuel-magazine via flue 16 and the chute 17.

The fire-pot section is provided with a clean-out passage 7^a, connected with the lower part thereof; but this is utilized only for draft purposes in starting a fire in the furnace. This passage is normally closed by a door 19, hinged to the cast front 20 of the furnace.

Surrounding the fuel-magazine are the vertical flues 21. The lower extremities of the flues surround ports 23, (see Fig. 5,) formed in the top 9 of the fire-pot section, while their upper extremities surround similar ports 24, formed in the bottom of a radiating-drum 25. This drum has an inner wall 25^a, surrounding a central opening 26. The drum is provided with a port from which leads a flue 25^c for the escape of the products of combustion. It is

also provided with another port surrounded by a flue 27, having a damper 28 at its outer extremity for controlling the draft of the furnace.

5 The body of the furnace is inclosed by a suitable sheet-metal casing 30, and the cast-iron front 20. This casing comprises four sections A, B, C, and D. The sections A and B are suitably connected with the front
10 20, while the section C, which is located above the front 20, extends entirely around the furnace. The top section D is provided with ports from which lead the hot-air flues 31. The upper surface of the section D is concave
15 to form a receptacle for some suitable material, as sand, to prevent radiation from the top of the furnace.

Supported within the casing, and resting upon the top of the fire-pot between two of
20 the flues 21, is the vapor-pan 32. This pan is open at the top, and supplies the air within the casing with moisture. This is an important feature in hot-air heating. This pan 32 projects through a suitable opening 33, formed
25 in the front 20 of the furnace. The exteriorly-projecting portion of the pan is closed by a hinged lid 34. When this lid is open, the pan may be replenished with water without removing it.

30 In using the furnace, a fire is started on the grate in the fire-pot, and the fuel is fed through the feed-chute 17 to the fuel-magazine, and thence to the fire-pot. The fuel-magazine may be filled as full as possible via the feed-chute
35 without danger of crowding the furnace. After starting the fire, the lower passage 7^a, leading to the fire-pot, is closed from the outside by shutting the door 19, and the oxygen necessary to support combustion is supplied
40 via the flue 18, whose outer extremity is controlled by a suitable door 18^a, which may be left open, or otherwise arranged to control the admission of air. This air is allowed a free passage to the fire-pot via the longitudinal
45 channels in the ribbed or corrugated wall of the fuel-magazine. The products of combustion, leaving the fire-pot, pass upward through the cast-iron flues 21 into the radiating-drum 25, and thence out through the flue
50 25^c. The course of the air and the products of combustion through the furnace is indicated by the plain arrows. (See Fig. 2.) This "downdraft" prevents the escape from the furnace of any combustible fuel-gases. In an
55 "updraft" furnace, a considerable portion of valuable fuel-gases is released in the upper part of the fuel-magazine by the heat from below, and allowed to escape to the stack. In my furnace, these gases are carried downward
60 into the fire-pot and consumed, resulting in perfect combustion. This invention may therefore be called a "smokeless" furnace, since in the presence of perfect combustion there is no smoke.

65 The cold air from a suitable flue (not shown) passes upward between the spider-arms of the base-ring, and thence into the space in-

closed by the casing 30, surrounding the furnace. This air passes around the fire-pot, thence upward around the fuel-magazine,
70 around and between the flues 21, and thence upward, around and through the drum, and thence out through the hot-air flues 31 after being heated to the desired degree by radiation from the surface of said parts.
75

The course of the air from the time it enters the space between the casing 30 and the heat-radiating surfaces, until it passes out through the flues 31, is indicated by the feathered arrows. (See Fig. 2.)
80

The water-jackets surrounding the fire-pot is provided with a suitable partition. (Shown by dotted lines in Fig. 4.) The water enters the jacket through a pipe 3 on one side of this
85 partition, passing around the fire-pot and out through a pipe 4 on the other side of the partition.

Having thus described my invention, what I claim is—

1. In a hot-air furnace, the combination of
90 the base-ring, the ash-pit, the fire-pot section, the fuel-magazine supported on the fire-pot section, said magazine being closed at the top and having a lateral opening just below the top, an inclined feed-chute inserted in said
95 opening, the radiating-drum located above the fuel-magazine, the vertical flues surrounding the fuel-magazine and connecting the fire-pot and the radiating-drum, the iron front having an opening registering with the outer ex-
100 tremity of the inclined feed-chute, and the sectional casing engaging the base-ring and surrounding the heat-radiating surfaces, substantially as shown and described.

2. In a hot-air furnace, the combination of
105 the base-ring comprising the outer and inner rims, the spider-arms connecting the rims, and the bed-plate surrounded by the inner rim and forming the bottom of the ash-pit; the vertical wall of the ash-pit engaging the
110 inner rim of the base-ring, the fire-pot section located above the ash-pit and supported thereon, the detachable top applied to the fire-pot section and having ports formed therein around the central opening, the fuel-maga-
115 zine applied to the top of the fire-pot section, said magazine being closed at the top and having a lateral opening formed just below the top, the inclined feed-chute inserted in said lateral opening of the fuel-magazine, the
120 radiating-drum located above the fuel-magazine, said drum having outer and inner vertical walls and a central opening, the bottom of the drum being provided with ports, vertical flues surrounding the fuel-magazine and
125 connecting the ports in the top of the fire-pot section and the ports in the drum, an outlet-flue also connected with the radiating-drum, and a suitable casing engaging the outer rim of the base-ring and inclosing the radiating-
130 surfaces, and hot-air pipes leading from the top of said casing, substantially as described.

3. In a hot-air furnace, the combination of the base-ring comprising the outer and inner

5 rims and the central bed-plate, the rims being connected by spider-arms, the ash-pit whose vertical wall engages a groove in the inner rim, the bed-plate of the base-ring forming the bottom of the ash-pit, the fire-pot section resting on the wall of the ash-pit and having a detachable top provided with a central opening, and ports surrounding said opening, the fuel-magazine applied to the top of the fire-pot section, said magazine being closed at the top and having its inner wall longitudinally grooved or corrugated, an inclined feed-chute projecting through an opening formed in the fuel-magazine just below its top, the drum located above the top of the fuel-magazine and having ports formed in its bottom,

a number of vertical flues surrounding the fuel-magazine and connecting the ports in the top of the fire-pot section with the ports in the bottom of the drum, an iron front having an opening registering with the mouth of the feed-chute, and a casing engaging the outer rim of the base-ring at the bottom, and hot-air pipes leading from the top of said casing, substantially as described.

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

CHARLES S. FAUROT.

Witnesses:

CHAS. E. DAWSON,
A. J. O'BRIEN.