

(No Model.)

2 Sheets—Sheet 1.

A. BAIR & A. E. STEINBRICK.
HOT AIR FURNACE.

No. 557,753.

Patented Apr. 7, 1896.

FIG. 1.

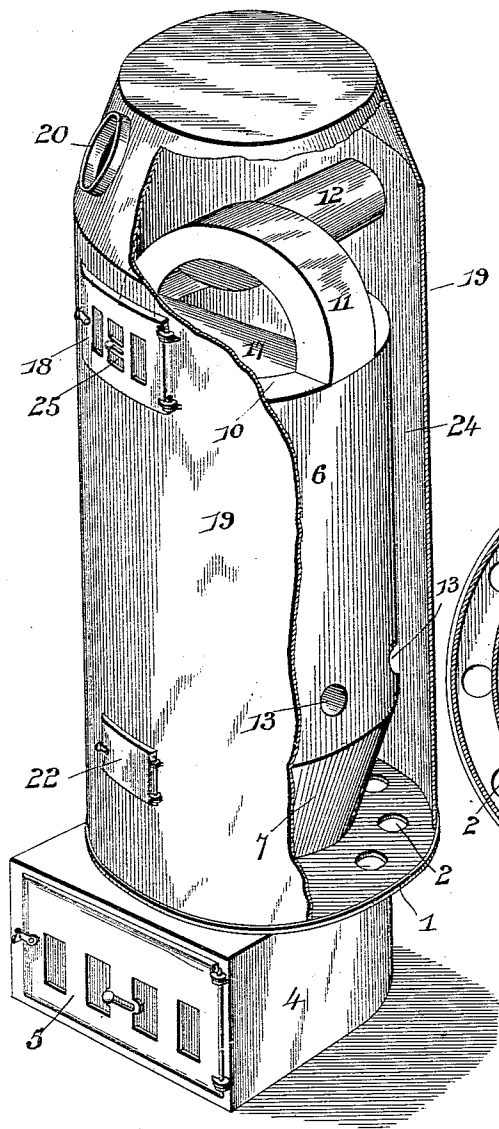
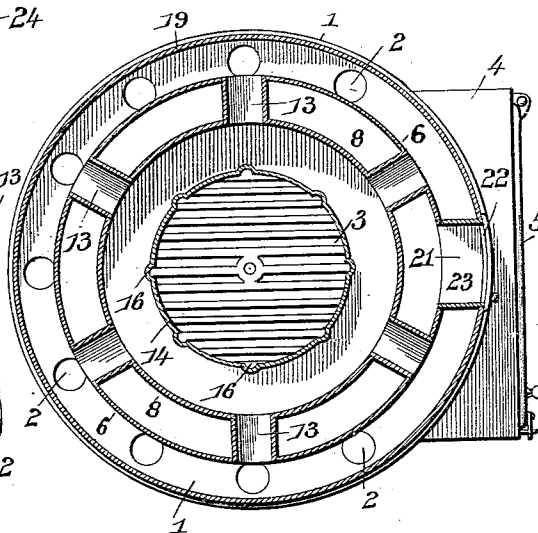


FIG. 4.



Inventors

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By their Attorneys.

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Witnesses
Jas. K. McCathran
V. B. Hillyard.

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2 Sheets—Sheet 2.

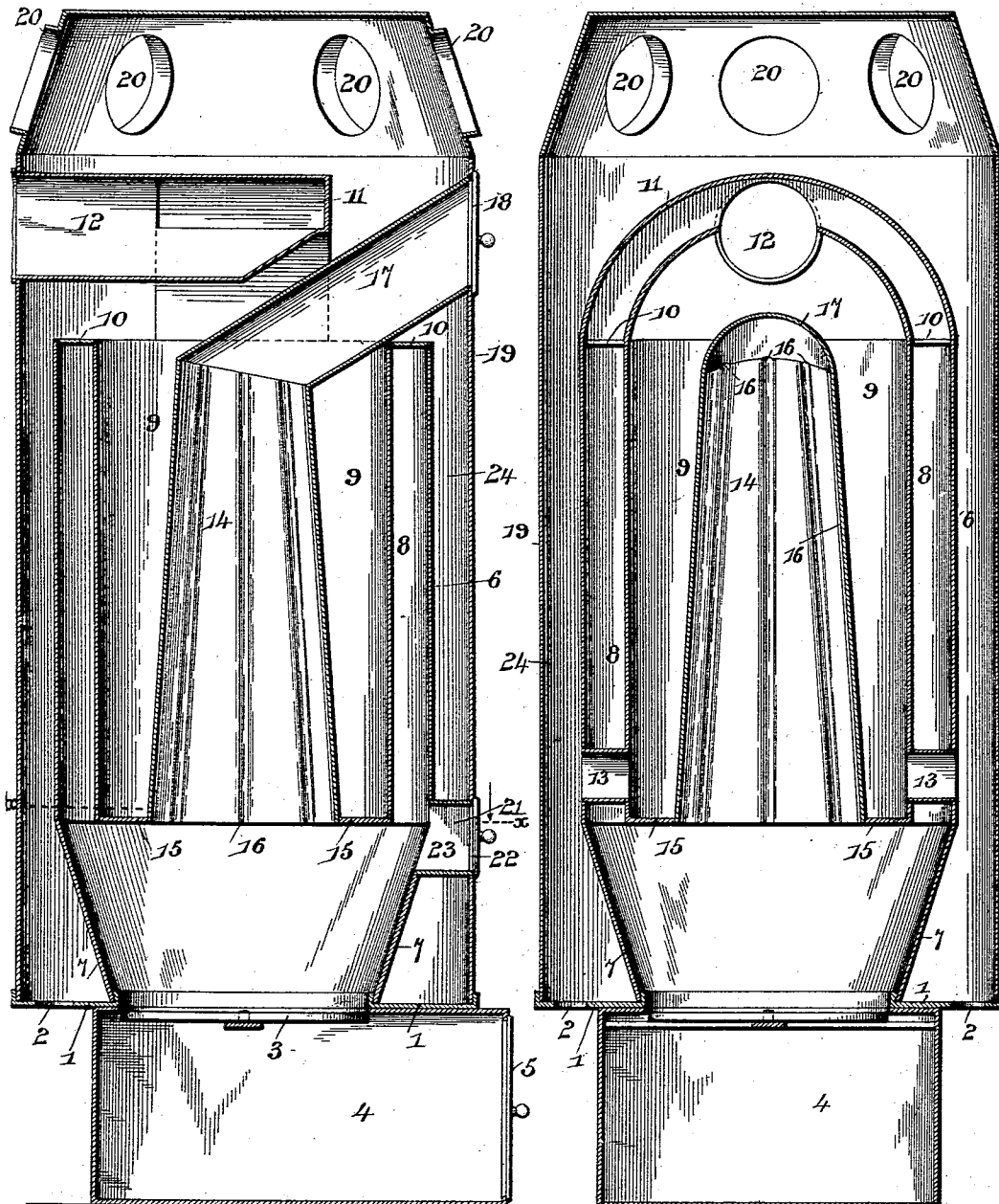
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FIG. 2.

FIG. 3.



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By their Attorneys, Alvin Bair
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UNITED STATES PATENT OFFICE.

ALVIN BAIR AND ALBERT E. STEINBRICK, OF TIFFIN, OHIO; SAID STEINBRICK ASSIGNOR TO SAID BAIR.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 557,753, dated April 7, 1896.

Application filed May 28, 1895. Serial No. 550,983. (No model.)

To all whom it may concern:

Be it known that we, ALVIN BAIR and ALBERT E. STEINBRICK, citizens of the United States, residing at Tiffin, in the county of Seneca and State of Ohio, have invented a new and useful Hot-Air Furnace, of which the following is a specification.

This invention aims to secure an extended heat-radiating surface whereby economy in the consumption of fuel results, and also to make provision for carrying off the gases from the magazine after the usual drafts have been closed; and with these ends in view the invention consists of a hollow drum or casing surrounding the magazine and which communicates at its lower end with the fire-pot and at its upper end with the smoke-pipe, and in means for supplying fresh air to the interior and to the exterior shells of the said drum or casing to be heated and conveyed to the required points for using; also in a magazine which has a series of grooves in its inner wall whereby vertical passages or flues are formed for the conveyance of air through the magazine into the fire-pot when it is required and desirable to have a current of air in this direction, so as to carry off the gases generated by the fuel in the magazine after the usual drafts have been closed.

The invention also consists of the novel features and the peculiar construction and combination of the parts, which hereinafter will be more fully set forth and claimed, and which are shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a hot-air furnace constructed in accordance with and embodying the principles of the present invention, parts being broken away to show the relative disposition of the cooperating elements. Fig. 2 is a vertical central section thereof. Fig. 3 is a vertical section taken at right angles to Fig. 2. Fig. 4 is a plan section on the line *xx* of Fig. 2.

Similar reference-numerals refer to corresponding parts in the various views.

The numeral 1 indicates a base upon which the furnace is erected, and consists of a cast-metal ring flanged at its inner and outer edges and which is formed with a series of perforations or openings 2. The furnace-

grate 3 is supported in any convenient manner within or opposite the central opening of the base 1, and below this grate is arranged the ash-pit 4, which is a closed box open at its front side, and which open side is closed by a door 5. A shell 6 has an inwardly-converging portion 7 at its lower end, which is fitted over the inner vertical flange of the base 1, and a shell 8, of less diameter than the shell 6, is placed within the latter; and the space 9 between the shells 6 and 8 is closed at its upper end by means of a ring or plate 10, which serves to connect the said shells at their upper ends and hold them in fixed relation. The lower end of the shell 8 terminates about in a plane corresponding with the juncture of the converging portion 7 with the shell 6, and the space occurring below the lower end of the shell 8 and within the converging portion 7 forms the fire-pot, and the same is in communication with the said space 9. An arched flue 11 connects at its lower ends with the space 9 at diametrically opposite points and with the smoke-pipe 12 at a point intermediate of its ends. A series of horizontally-disposed tubes 13 extend through the space 9 and connect the shells 6 and 8 at their lower ends, and these tubes serve to convey fresh air into the space inclosed by the inner shell 8.

The magazine 14 is supported at its lower end by means of a ledge or flange 15 extending inwardly from the lower end of the shell 8, and this magazine tapers and is smaller at its upper or receiving end than at its lower end and is provided in its sides with a series of grooves or channels 16, which extend vertically and which form passages or flues for the circulation of air therethrough when the lower drafts are closed. This magazine 14 is arranged within the shell 8 and communicates at its upper end with an inclined chute 17, by means of which the fuel is supplied thereto, and this chute 17 is arranged at right angles to the arched flue 11 and projects in an opposite direction to the smoke-pipe 12 and occurs in the space formed between the plate or ring 10 and the said arched flue 11 and is closed at its outer end by means of a door 18 hinged to the casing 19 surrounding the shell 6 and supported at its lower end upon the

base 1. This casing 19 is of sheet metal and is closed at its upper end and is provided with a series of short nipples 20 for attachment therewith of the hot-air pipe for conveying the heated air to the required point of discharge. The fire-pot is reached through an opening 21 near the lower end of the casing 19, which is closed by means of a door 22, and a short length of pipe 23 extends across the space between the casing 19 and the shell 6 and opens at its inner end into the said fire-pot.

In the operation of the furnace the cold air passes through the openings 2 of the base 1 and enters the space 24 formed between the casing 19 and the shell 6, and the greater part of this air is heated by radiation of the heat from the shell 6, and a portion of the air passes from the space 24 through the tubes 13 into the space formed between the magazine 14 and the shell 8 and is heated by radiation of heat from the shell 8, and the heated air from the shell 8 commingles with the heated air from the space 24 above the plate or ring 10 and is led to the required point for using by means of a suitable hot-air pipe or pipes applied to the nipples 20 in the usual manner. In the event of the usual drafts being closed, air is drawn into the magazine through suitable openings 25 in the door 18 and passes through the grooves or channels 16 and supports combustion in the fire-pot in the usual manner. The air passing through the magazine takes up all gases, and the latter are consumed, thereby utilizing the fuel to the best possible advantage.

The construction and disposition of the parts herein specified are preferred; but it is contemplated to apply the invention to any make or style of hot-air furnace. Therefore in adapting the same to the particular make and pattern of heater various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. A hot-air furnace comprising an enveloping casing, concentric shells arranged to inclose a space between their opposing sides

and located within the casing, and having the said space closed at its upper end, the outer shell having its lower portion projecting below the inner shell and converging to form a fire-pot, an arched flue spanning the concentric shells and having communication with the space formed therebetween at diametrically opposite points, and communicating at a middle point with the smoke-pipe, a magazine supported upon a ledge extending inwardly from the inner shell, and a chute extending in an opposite direction to the smoke-pipe and communicating with the upper end of the magazine, and extending into the space spanned by the aforesaid arched flue, substantially as set forth for the purpose described.

2. A hot-air furnace comprising a base having a series of openings, an enveloping casing, concentric shells having a space between their opposing sides and having said space closed at its upper end, the lower portion of the outer shell converging and extending below the inner shell to form a fire-pot and resting upon the said base, horizontally-disposed tubes extending through the space between the concentric shells and connecting the space surrounding the outer shell with the space inclosed by the inner shell, an arched flue communicating with the smoke-pipe and having its ends connecting with the space between the shells at diametrically-opposite points, a magazine having grooves or channels to form vertical air-passages and supported upon a ledge extending inwardly from the inner shell, and a chute extending in an opposite direction to the smoke-pipe and projecting into the space spanned by the said arched flue and communicating with the upper end of the magazine and opening through the casing, and closed by means of a door having damper-controlled openings, substantially as described for the purpose set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

ALVIN BAIR.

ALBERT E. STEINBRICK.

Witnesses:

GEORGE A. ROHN,

WILLIS BACON.