

(No Model.)

2 Sheets—Sheet 1.

D. L. STINE.  
VENTILATING HEATER.

No. 420,123.

Patented Jan. 28, 1890.

Fig. 1.

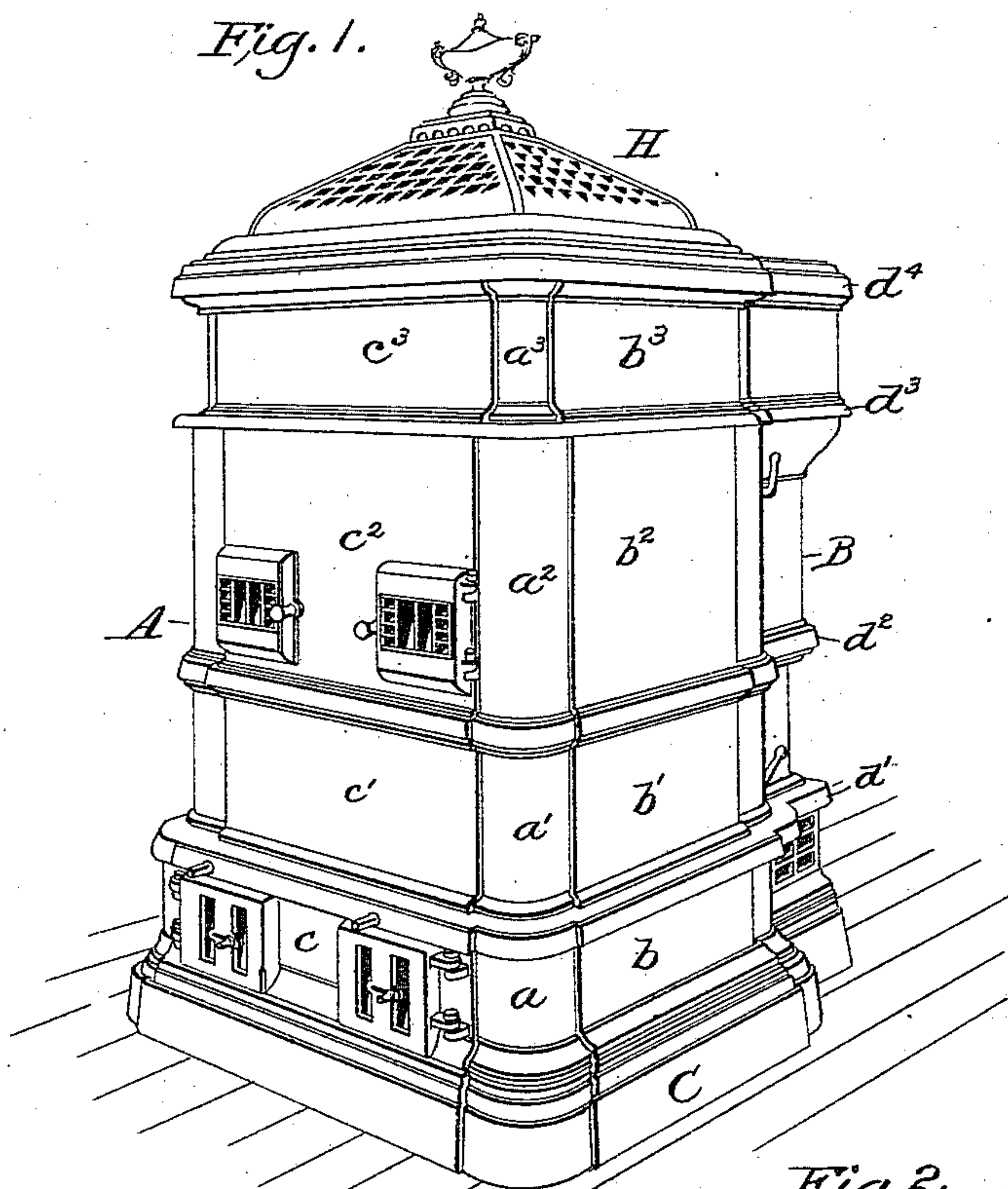


Fig. 2.

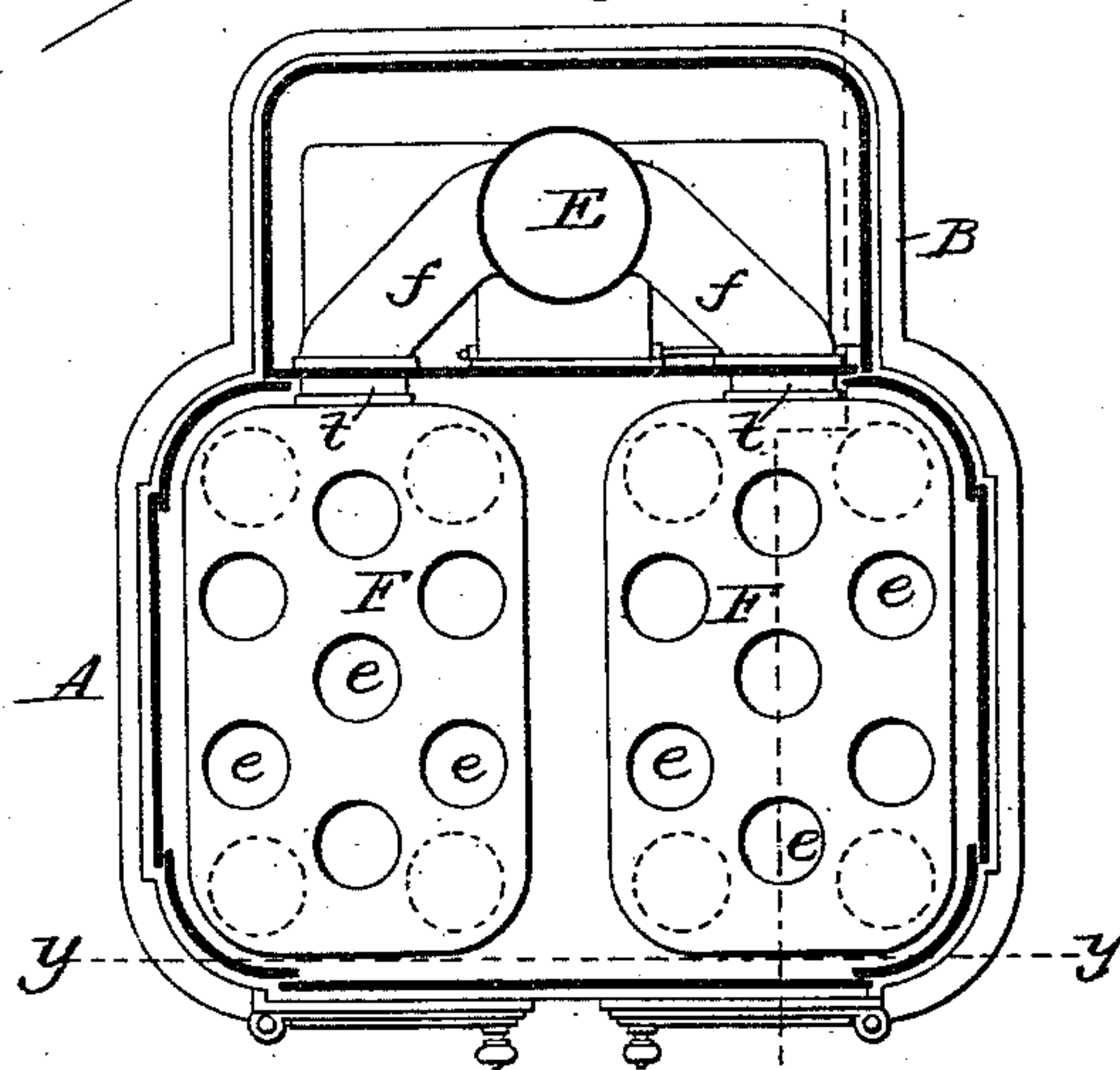
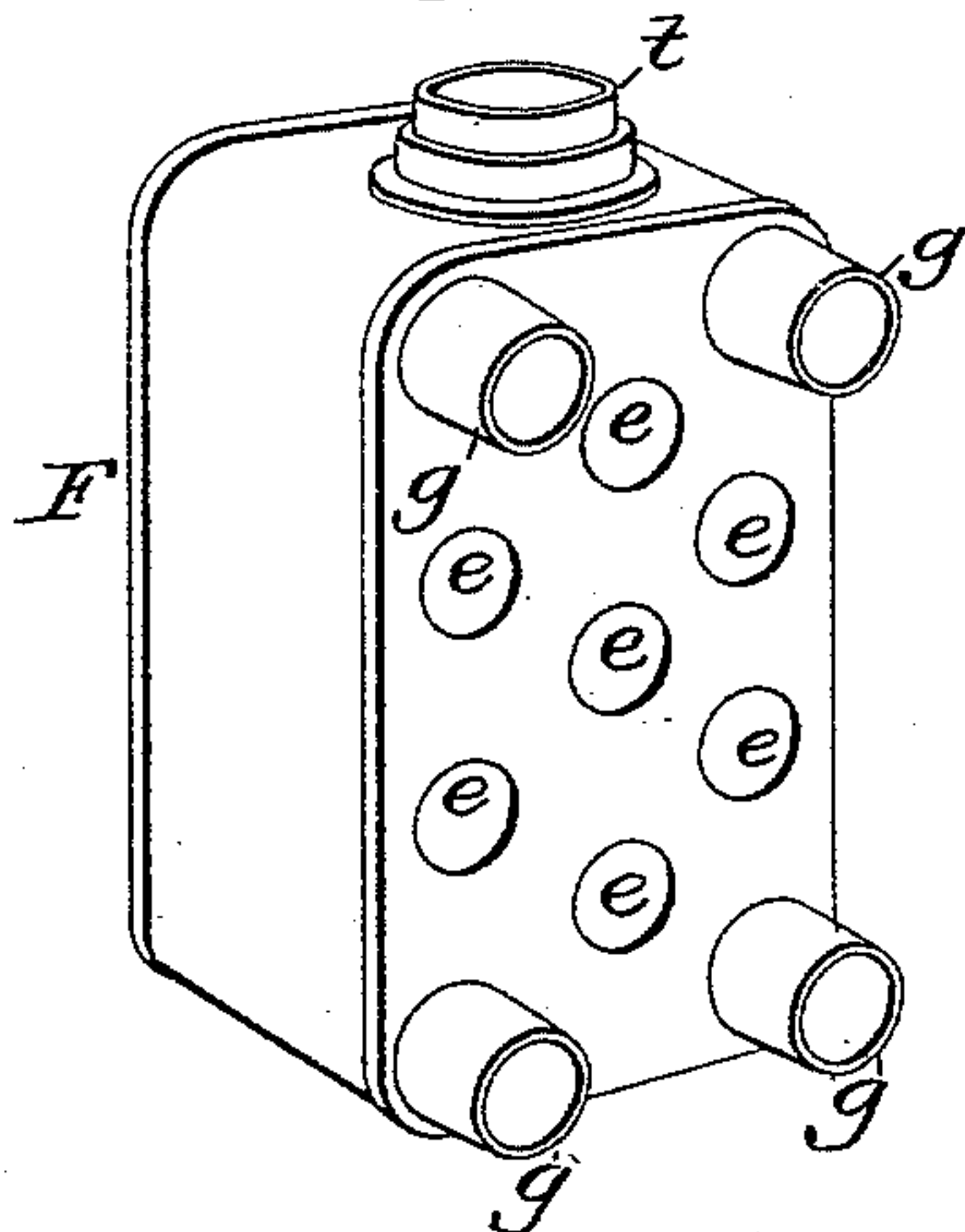


Fig. 3.



Witnesses:

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Inventor:

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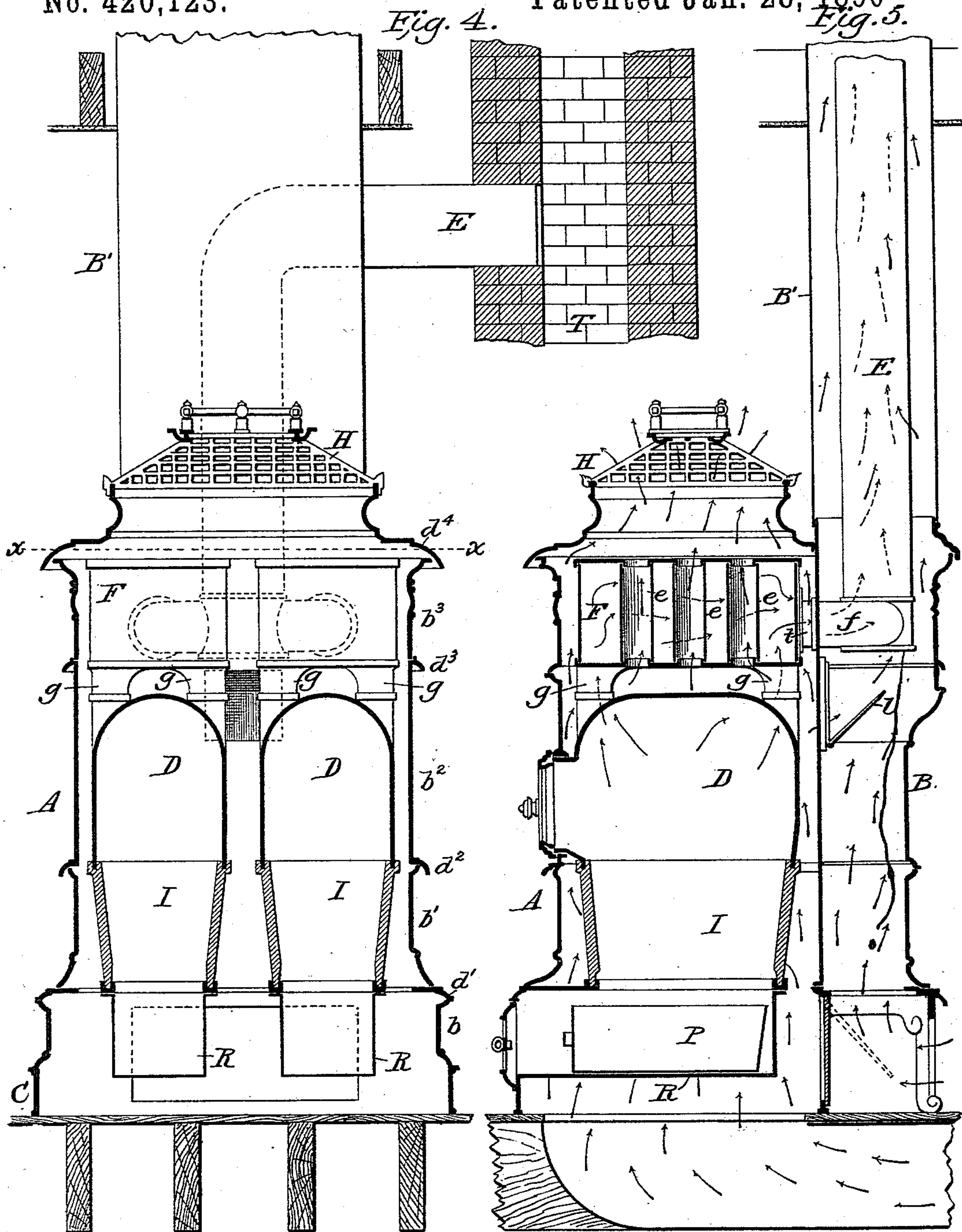
(No Model.)

2 Sheets—Sheet 2.

D. L. STINE.  
VENTILATING HEATER.

No. 420,123.

Patented Jan. 28, 1890



Witnesses:

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Horace A. Dodge.

Inventor:

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# UNITED STATES PATENT OFFICE.

DAVID L. STINE, OF TOLEDO, OHIO, ASSIGNOR TO SMEAD & NORTHCOTT, OF ELMIRA, NEW YORK.

## VENTILATING-HEATER.

SPECIFICATION forming part of Letters Patent No. 420,123, dated January 28, 1890.

Application filed August 14, 1889. Serial No. 320,698. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID L. STINE, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Ventilating-Heaters, of which the following is a specification.

This invention relates to that class of stoves or heaters designed to both warm and ventilate rooms or buildings, it being more especially designed for use in school-rooms and similar structures; and the invention consists in a novel construction and arrangement of parts, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a perspective elevation of a double heater made on my plan. Fig. 2 is a transverse horizontal section on the line  $x x$  of Fig. 4. Fig. 3 is a perspective of one of the heating-drums detached. Fig. 4 is a transverse vertical section on the line  $y y$  of Fig. 2, and Fig. 5 is a similar sectional view on the line  $z z$  of Fig. 2.

The object of this invention is to produce a heater that can be made up either as a double or a single heater to adapt it to rooms of different sizes, and so that the capacity of the double heater can be varied to adapt it to the variations of temperature, and which at the same time shall serve as an efficient ventilator of the room.

In constructing my improved heater I make the body or case A of a series of cast-iron plates  $c c'$ ,  $c^2 c^3$  and  $b, b', b^2$ , and  $b^3$ , as shown in Fig. 1, with corner-pieces  $a, a', a^2$ , and  $a^3$ , each horizontal series or ring of plates being connected to the adjoining series above and below by an interposed ring or plate, as shown by  $d, d', d^2, d^3$ , and  $d^4$ , the whole resting on a corresponding base-plate C and covered at the top by an ornamental reticulated cover or cap H. At the rear this case is made with a projection B, as shown in Figs. 1, 2, and 5, which projection forms a ventilating-flue, as will be hereinafter more fully explained. At its base this compartment or flue B is provided with openings for the admission of air from the room, and it has a pivoted valve  $v$  arranged within it, as shown in Fig. 5, by which the air can be caused to ascend the flue B or can be made to pass

within the body and against the fire-pot, as may be desired. Some distance above and about on a line with the top of the fire-chamber or dome D an opening is made connecting the heat-chamber with the ventilating-flue B, and this is also provided with a damper or valve  $l$ , for opening or closing the same at will, as shown in Fig. 5. I then provide a fire-pot I, on which I place a cast-iron dome D, as shown in Figs. 4 and 5, this dome being provided at each of its four corners above with an opening surrounded by a suitable collar to connect with the corresponding short pipes  $g$  of the drum F, which is located directly over the dome, as shown clearly in Fig. 5. This drum F (shown detached in Fig. 3,) is composed of a top and bottom plate of cast-iron, with a sheet-iron casing and with a series of flues  $e$ , which extend vertically through it, as shown in Figs. 2, 3, and 5. This drum is also provided with a collar  $t$  on its rear side for the attachment of the smoke-pipe  $f$ , as shown in Figs. 2, 3, and 5. The fire-pot is provided with a suitable grate, and is located at such a height as to leave room below for an ash-pan P, supported on a bottom plate R, which is elevated above the floor some distance, as shown in Figs. 4 and 5, to admit of the air passing freely under and around it.

Having thus constructed the various parts to make a double heater, I set two of the fire-pots, domes, and drums side by side within the case, as shown in Fig. 4, they being so located as to leave a free open space between them for the passage of the air to be heated.

Each of the drums F has a short diagonal or curved smoke-pipe  $f$ , connecting it with the vertical or main smoke-pipe E, located within the ventilating-flue B, as shown in Figs. 3 and 5, the ventilating-flue B being extended by the addition of a sheet-metal pipe B', which incloses the smoke-pipe E, and with the latter is continued to the top of the room and out through the roof, in case there be no chimney. If there be a chimney, then the smoke-pipe E may be provided with an elbow and made to pass out through the side of the ventilating-pipe B', as represented in Fig. 4, the ventilating-pipe being continued up and out through the roof. If thought advisable,



the ventilating-pipe B', instead of passing out through the roof, may terminate in the attic or space under the roof, said attic being provided with suitable openings for the escape of the foul air delivered by the pipe B'; or, if a separate flue be provided aside from the smoke-flue, then the ventilating-pipe may be connected with that; but the simplest and most efficient plan is to extend both the smoke and the ventilating pipes directly upward and out through the roof, as in such case the flow of the smoke and the air is less retarded, and the heat from the smoke-pipe will be utilized throughout its entire length for warming the air in the ventilating-pipe B', thereby securing a stronger draft for ventilation, although either plan will give good results. It is obvious that the plan will have to be varied according to circumstances, depending on the style or condition of the building, the location of the heater in upper or lower rooms, &c., the heater itself being adapted to all these varying conditions.

In using these heaters they are set over an opening connecting with a fresh-air inlet, as shown in Fig. 5, so that the air which enters at the bottom passes upward around and between the two fire-pots and domes, then inward over the tops of the domes, and then up through the tubes *e* and around the drums F, and thence through the open-work top H out into the room. By this arrangement it will be seen that a large volume of fresh air is admitted and that it is brought in contact with a large extent of heating-surface, whereby a large volume of fresh air can be thoroughly warmed. By causing the smoke to pass through the drums F, where it surrounds the tubes *e*, as well as heating the outer walls of the drums, the heat is much more effectively utilized than is customary in this class of heaters as generally constructed, and what heat there is left in the escaping smoke and gases is most effectively utilized in increasing the draft of the ventilating-flue, thereby securing a most efficient ventilation of the room.

When starting the fire in the morning to warm a cold room and get it ready for the scholars, the valve *v* may be turned so as to close the opening into the ventilating-flue B, whereby the air from the room will pass into the heater, thus lessening the quantity drawn in from the outside, and which, if the weather be extremely cold, may be shut off entirely by a valve in the air-duct, (and which, being common, is not shown,) and thus the air in the room may be made to pass through the heater continuously until it has been raised to the proper temperature, after which the valves will be adjusted so as to admit a continuous supply of fresh air to the heater and continuously draw the foul air from the room into the ventilating-flue; or, if it be desired, by adjusting the valve *v* a portion of the air from the room may be taken out through the

vent-pipe and a portion be conducted into the heater, the valve *v* being capable of being adjusted to any point between the two extremes of its movement.

If at any time it should be desirable to increase the draft of the ventilating-flue, the upper valve *l* can be opened more or less, thereby admitting some of the more highly-heated air into the upper part of the vent-flue B to increase its draft below. So, too, this valve can be opened to permit the escape of a portion of the heated air from within the heater whenever the room is too warm or the weather very mild.

By having two independent fire-pots, domes, and drums the heater is adapted to all extremes of weather and to various-sized rooms, as a fire can be used in one or in both at will, there being separate doors for each, as shown in Figs. 1, 3, and 5.

When it is desired to make up the apparatus as a single heater, I use the same corner-pieces *a a'*, &c., and the same side pieces *b b'*, &c., and also the same doors, but provide a base-plate C, rings *d d'*, &c., and a cover H, correspondingly narrower on the line *y y*, Fig. 2, to form the case or body, and then arrange within it a single fire-pot, dome, and drum, in all respects the same as is shown or used in the double heaters. It will be seen that by this construction the same patterns are made to answer for both the single and the double heater, with the exceptions above named, and that thus the cost of production is materially reduced. By these means I am enabled to produce these ventilating-heaters varying greatly in capacity, and yet in all other respects having the same functions. The single heater is ample for a small or ordinary sized school-room, while the double heater is sufficient, not only for the larger school-rooms, but also for stores, public halls, and the like, while two of the double heaters are sufficient to warm an ordinary-sized church or similar building.

It is obvious that by simply making the case wider more than two separate fire-pots, &c., may be used, the principle or mode of construction being the same; but this will seldom, if ever, be required.

I am aware that patents have been granted for furnaces having two separate fire-pots, but which furnaces were so constructed that the parts could not be used in the construction of either a single or double heater, as in this case, and therefore I do not claim, broadly and irrespective of construction, the use of two fire-pots; but,

Having fully described my invention, so as to enable others to construct and use the same, what I claim is—

1. The combination, in a ventilating-heater, of a casing or body A, open at top and bottom for the passage of air through the same, and two separate fire-chambers and heating-drums, each entirely independent of the other,



the construction and arrangement of parts being substantially such as herein described and shown.

2. The combination, in a ventilating-heater, 5 of the case or body A, open at top and bottom and having at its rear a projection B to form a ventilating-flue, said projection or ventilating-flue being provided at its base with openings for the entrance of air into said 10 flue and also into the casing or body A, and a valve *v*, arranged to divert the air from the room into the ventilating-flue or into the body of the heater at will, substantially as shown and described.

3. In combination with the body or casing 15 A, open at bottom and top and having one or more fire-chambers therein, the ventilating-flue B, provided with the openings and valve *v* at its base, and the opening, with the valve *l*, leading from the heat-chamber into the ven- 20 tilating-flue above, substantially as shown and described.

In witness whereof I hereunto set my hand in the presence of two witnesses.

DAVID L. STINE.

Witnesses:

THOS. H. TRACY,

RICHARD M. MCKEE.