

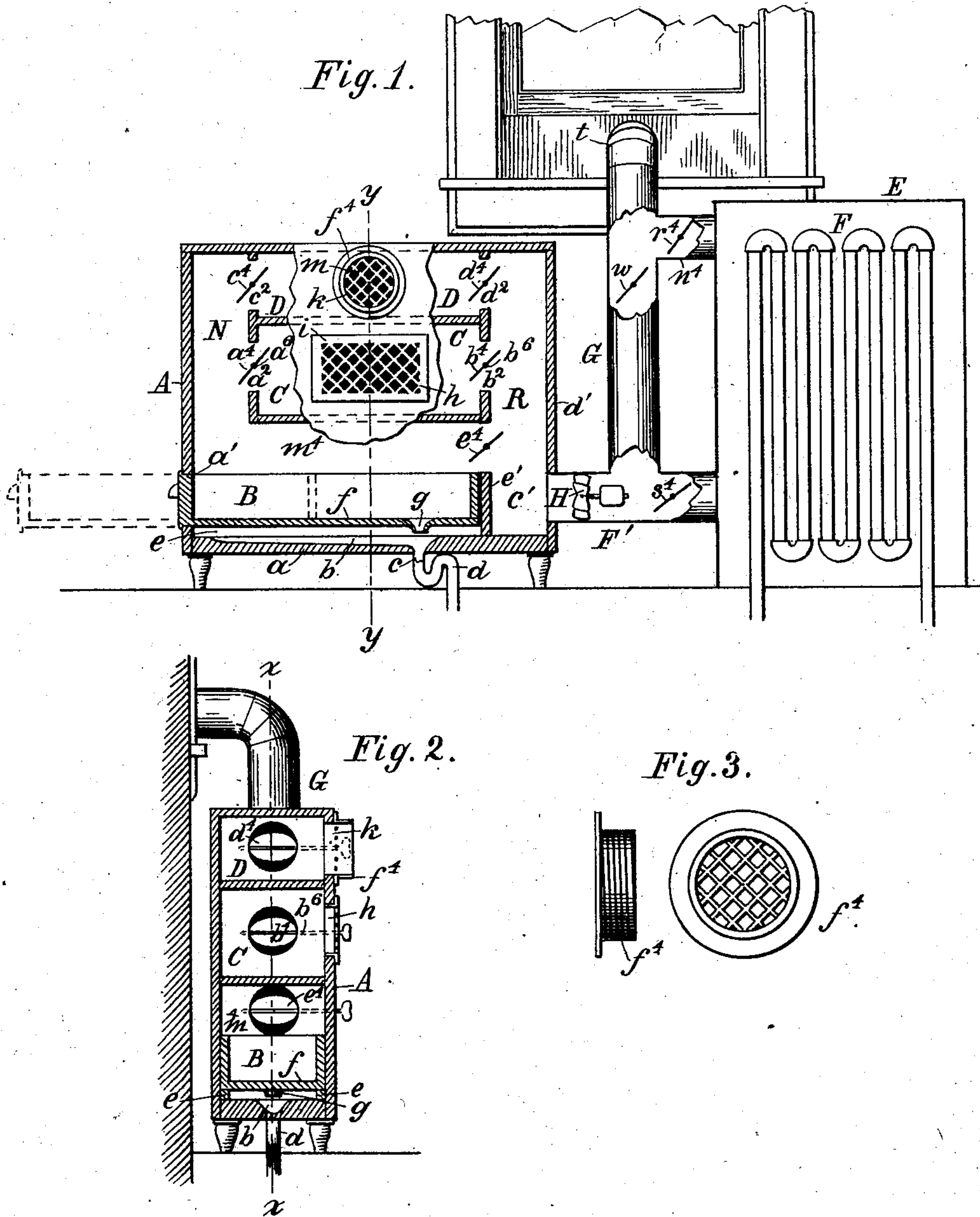
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J. & W. TITUS.  
CABINET AIR COOLER OR HEATER.

APPLICATION FILED JUNE 7, 1902.

NO MODEL.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## CABINET AIR COOLER OR HEATER.

SPECIFICATION forming part of Letters Patent No. 721,254, dated February 24, 1903.

Application filed June 7, 1902. Serial No. 110,572. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN TITUS, a resident of Oyster Bay, and WILLIAM TITUS, a resident of Old Westbury, in the township of North Hempstead, in the county of Nassau and State of New York, citizens of the United States, have invented certain new and useful Improvements in Cabinet Air Coolers or Heaters; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical longitudinal sectional view of an apparatus made according to our invention, taken in the line  $x x$  of Fig. 2. Fig. 2 is a vertical transverse sectional view thereof, taken in the line  $y y$  of Fig. 1. Fig. 3 comprises detail views of one part of the apparatus.

This invention is more especially intended for use in sick-rooms, hospitals, &c., but may be employed in other apartments wherein air of regulated temperature is desired.

It comprises certain new and useful combinations of parts hereinafter fully set forth, whereby fresh air of normal temperature, air artificially refrigerated, and air artificially warmed or heated may be secured at will as the requirements in any given case may require.

A is a closed case or cabinet, in the bottom of which is a channel  $b$ , which communicates with an outlet  $c$ , which may have a gooseneck or trap  $d$ .

B is a movable drawer intended to contain ice. It is in the lower part of the cabinet A and slides through one side thereof in a suitable opening  $a'$ , provided for the purpose. The lower lateral edges of this drawer should rest upon guides or cleats  $e$  of the sides of the cabinet and so arranged as to support the drawer slightly above the channeled surface of the bottom  $a$ . In the bottom  $f$  of the drawer is an outlet  $g$ , which when the drawer is in normal position, as shown in Fig. 1, should be substantially coincident with the outlet  $c$  in the bottom  $a$  of the cabinet. The bottom  $f$  of the drawer is so constructed that liquids therein will tend to flow to said outlet  $g$ . The ice-drawer B should not extend to the oppo-

site end of the cabinet; but a space  $c'$  is provided between the inner end of the drawer and the adjacent wall  $d'$  of the cabinet for a purpose herein presently explained. To prevent the drawer from being pushed inward too far, a stop  $e'$  may be provided at its said inner end, as shown in Fig. 1.

Provided at or near the middle of the cabinet is a chamber C, in the front of which—that is to say, in the front of the cabinet, which also provides the front of said chamber—is an air-outlet opening  $h$ , in which is a register or valve  $i$ , whereby the outflow of air therethrough may be controlled. In the ends of this chamber C are openings  $a^2$  and  $b^2$ , which are provided with butterfly or other suitable valves  $a^4$  and  $b^4$ , respectively. Each of the axial rods or gudgeons  $a^6$  and  $b^6$ , respectively, of these valves may at one end extend through an adjacent wall of the cabinet, so that said valves may be operated from the outside of the latter. Above the chamber C is another chamber D of like construction, having in its front an opening  $k$ , in which is a register  $m$ , and at its ends openings  $c^2$  and  $d^2$  and in which are valves  $c^4$  and  $d^4$ , which, like the valves  $a^4$  and  $b^4$ , are provided with means for operating them from the outside of the cabinet. For convenience of description we term this second chamber D a “secondary” chamber. Above the inner end of the ice-drawer is a valve  $e^4$ , which in construction and operation may be similar to the just-mentioned valves  $a^4$   $b^4$ , &c., but the office of which is to regulate the passage of air through the space or passage  $m^4$  over the ice-drawer, as herein presently further explained. The length of the chambers C and D is so proportioned that at the opposite ends thereof are provided vertical passages N and R, which communicate with the opposite ends of the space or passage  $m^4$ , which is between the top of the ice-box and the bottom of the chamber C.

E is a hot-air box, in which is a steam or hot-water coil or radiator F or other suitable means for heating the aeriform contents of said box E. Shown at G is an air-inlet trunk, which communicates with the air external to the room or apartment in which the cabinet is placed. This may be most conveniently



secured by causing the upper end of the trunk to connect with an opening formed through a window of the apartment, as shown at *t*. The upper part of this trunk communicates with the upper part of the box E by a passage *n*<sup>4</sup>, in which is a valve *r*<sup>4</sup>. Between the lower part of the cabinet and that of the hot-air box E is a horizontal passage F', with which communicates the lower end of the trunk G. In the latter is a valve *w*. Between the said lower end of the latter and the lower part of the hot-air box is a valve *s*<sup>4</sup>. Also provided in the passage F' is a fan or air-propelling apparatus H, which may be operated by any suitable power to propel air from the trunk and from the hot-air box into the cabinet. The ice-drawer may be filled with ice or refrigerant by temporarily and either wholly or partially withdrawing the same, as indicated by dotted lines in Fig. 1. As hereinbefore explained, the hot-air box may be heated by any suitable means, but preferably by a steam or hot-water coil, as hereinbefore set forth.

The ice-drawer B being duly supplied with ice or refrigerating material and the heating of the hot-air box duly provided for, the operation of the apparatus is as follows: The valve *w* being open, closing the valves *s*<sup>4</sup>, *b*<sup>4</sup>, *d*<sup>4</sup>, and *a*<sup>4</sup> and opening the valves *e*<sup>4</sup> and *c*<sup>4</sup>, the air drawn in by the fan H through the trunk G is caused to pass through the span or passage *m*<sup>4</sup> over and in contact with the ice or refrigerant in the ice-drawer B, then upward through the vertical passage N, through the opening *c*<sup>2</sup>, to the outlet-opening *k*, and thence to the apartment in which the cabinet is placed, the air being in this case simply refrigerated. By opening the valves *s*<sup>4</sup> and *d*<sup>4</sup> heated air from the hot-air box E is passed to the chamber D and there mingling with the cold and refrigerated air received through the opening *c*<sup>2</sup>, as just described, raises the temperature thereof to any desired degree, the air being thus tempered as concerns both humidity and temperature to meet the requirements of any given occasion. This tempered air of course makes its exit from the chamber D through the upper front opening, its volume in passing through the said opening being controlled by the register *m*. When simply heated air is required, the valves *e*<sup>4</sup>, *b*<sup>4</sup>, and *c*<sup>4</sup> and *w* are closed and the valves *r*<sup>4</sup>, *s*<sup>4</sup>, and *d*<sup>4</sup> are open, so that the air heated by passing through the hot-air box E is directed through the passages F and R and opening *d*<sup>2</sup> to the opening *k*, from which it makes its exit controlled by the register *m*, as described. It will be observed that the upper front opening *k* is of relatively small size as compared with the lower front opening *h* and that it is preferably of circular shape and provided with means—as, for example, a screw-threaded nozzle *f*<sup>4</sup>—whereby a conducting-pipe may be provided to said upper opening *k*, so that the tempered or treated air may be conducted to any desired

point for localized use or application in the treatment of diseases or otherwise. When the air cooled, heated, or tempered is to be discharged into the atmosphere of the room in which the cabinet is placed, use is made of the chamber C, its outlet-opening *h*, &c., as follows: The valves *c*<sup>4</sup> and *d*<sup>4</sup> are closed to shut off access to the chamber D. Air passed through the space or passage *m*<sup>4</sup> is cooled by contact with the refrigerant in the ice-drawer and passes up into the lower part of the passage N and, the valve *a*<sup>4</sup> being opened, through the opening *a*<sup>2</sup> to the chamber C and thence out through the lower front opening *h*. When simply heated air is required, the valves *e*<sup>4</sup> and *a*<sup>4</sup> are closed and the valve *b*<sup>4</sup> is opened and the air from the hot-air box enters the chamber C and thence makes its exit into the room where the cabinet is placed. By similarly opening the valves *e*<sup>4</sup>, *b*<sup>4</sup>, *a*<sup>4</sup>, *s*<sup>4</sup>, *w*, and *r*<sup>4</sup> the currents of cold and hot air are commingled in the chamber C, and the air tempered accordingly passes out through the lower front opening *h*. When simply fresh external air is required for the atmosphere of the room, all the valves except *w* and *b*<sup>4</sup> are closed, so that the air passes direct from the trunk G through passages F' and R, through the opening *b*<sup>2</sup> to the lower front opening *h*. In like manner when for any reason only fresh external air is desired for the outlet *k* all the valves except *w* and *d*<sup>4</sup> are closed and the unmodified air-current is transmitted directly from the trunk to the said outlet or opening *k* of the chamber D. By making the ice receptacle or drawer B slidable at the bottom of the cabinet the same may be very conveniently emptied and easily supplied with refrigerating material, and by the several arrangements and combinations of parts described we are able to provide air dried, cooled, heated, or tempered to any requisite degree either for local use or application to or upon the person of a patient or for respiratory purposes in the different atmosphere of the apartment in which the cabinet is placed, the apparatus being thus adapted to a wide range of uses—medical, hygienic, or sanitary, as the case may be. When fresh air of normal temperature is desired from the secondary chamber D, the valves *w* and *d*<sup>4</sup> are opened and all the others are closed. In like manner when fresh air of normal temperature is desired from the chamber C the valves *w* and *b*<sup>4</sup> are opened and all the others are closed.

What we claim as our invention is—

1. The combination with a closed cabinet, of a horizontal slidable ice-drawer placed in the lower part thereof and capable of withdrawal therefrom and a chamber located above said drawer with a horizontal air-passage between, of a register provided in an air-outlet which opens from said chamber through the wall of the cabinet, a valved air-inlet opening to said chamber, an air-trunk for supplying air to the cabinet at a part remote from the said air-inlet to the chamber,



and an air-forcing device for directing a volume of air over the contents of the drawer thence to and through said inlet into the chamber, and thence through the registered outlet-opening, as described.

2. The combination with a closed cabinet the bottom whereof is channeled and provided with a water-escape outlet, and a horizontally-slidable ice-drawer which has in its bottom an outlet for the escape of water to the cabinet-bottom below and which is capable of withdrawal from the cabinet, of a chamber located above said ice-drawer with a horizontal passage between, a register provided in an opening from the chamber through the wall of the cabinet, a valved air-inlet opening to said chamber, an air-trunk for supplying air to the cabinet at a place remote from the inlet of the chamber, a valve for controlling the volume of air passed through the passage between the ice-drawer and the chamber and an air-forcing mechanism for directing air from the trunk through said passage to the inlet of the chamber and from the latter through the registered opening from the chamber, as described.

3. The combination with a closed cabinet, of a horizontal slidable ice-drawer placed in the lower part thereof and capable of withdrawal therefrom, a chamber located above said drawer with a horizontal air-passage between, and a valve for controlling the volume of air therethrough, of a register provided in an outlet which opens from the chamber through the wall of the cabinet, valves provided to air-inlets at opposite sides of said chamber, an air-trunk for supplying air to the cabinet, a hot-air box, a valved connection between the air-trunk and the upper part of the hot-air box, a valved communication between the lower part of the cabinet and the lower part of the hot-air box, and means for forcing the air from the trunk and hot-air box into the cabinet, as described.

4. The combination with a closed cabinet the bottom whereof is channeled and provided with a water-escape outlet, and a horizontal ice-drawer which has in its bottom an outlet for the escape of water to the cabinet-bottom below and which is capable of withdrawal from the cabinet, a chamber located above said drawer with a horizontal air-passage between, and a valve for controlling the volume of air therethrough, of a register provided in an outlet which opens from the chamber through the wall of the cabinet, valves provided to air-inlets at opposite sides of said chamber, an air-trunk for supplying air to the cabinet, a hot-air box, a valved connection between the air-trunk and the upper part of the hot-air box, a valved connection between the

lower part of the cabinet and the lower part of the ice-box and means for forcing the air from the trunk and hot-air box into the cabinet, as described.

5. The combination with a closed cabinet, of a slidable ice-drawer placed in the lower part thereof, and capable of withdrawal therefrom, a chamber located above said drawer with a horizontal air-passage between, a register provided in an air-outlet which opens from said chamber through the wall of the cabinet, valves provided to air-inlets at opposite sides of said chamber, an air-trunk for supplying air to said chamber, a hot-air box, a valved connection between the air-trunk and the upper part of the hot-air box and a valved connection between the lower part of the cabinet and the lower part of the hot-air box, of a secondary chamber which has valved openings at opposite sides of said chamber, a register placed in an opening from said secondary chamber through the wall of the cabinet, mechanisms provided to said last-mentioned opening for the attachment of a conduit pipe or tube thereto, and means for forcing air from the trunk and the hot-air box into the cabinet and thence through one or the other of the respective registered openings thereof, as described.

6. The combination with a closed cabinet of a horizontal slidable ice-drawer in the lower part thereof, a chamber placed above said drawer with an air-passage between, valves provided to inlet-openings at opposite sides of said chamber, a register placed in a relatively large opening from said chamber through the wall of the cabinet for sending a diffused volume of air into the atmosphere of the room or apartment in which the cabinet is placed, a secondary chamber having valved openings at opposite sides, a register placed in a relatively small outlet-opening from said secondary chamber, a device provided to said relatively small opening for the attachment thereto of a pipe or hose for conducting a concentrated volume of air to points more or less remote from the cabinet, a hot-air box, a valved trunk for the supply of air to the hot-air box and also direct to the cabinet, and mechanism for forcing the said supply in whole or in part to one or the other, or to both, of the aforesaid chambers and thence to their registered outlets according to the adjustment of the several valves pertaining thereto, as described.

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Witnesses:

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