

(No Model.)

E. T. JOHNSON.

HEATING AND VENTILATING APPARATUS.

No. 376,746.

Patented Jan. 24, 1888.

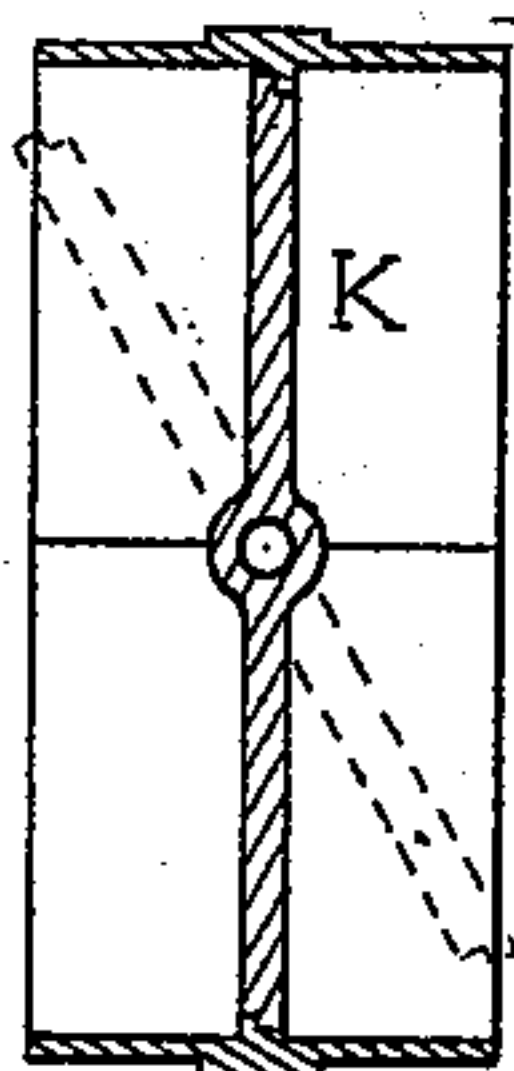


Fig. 2.

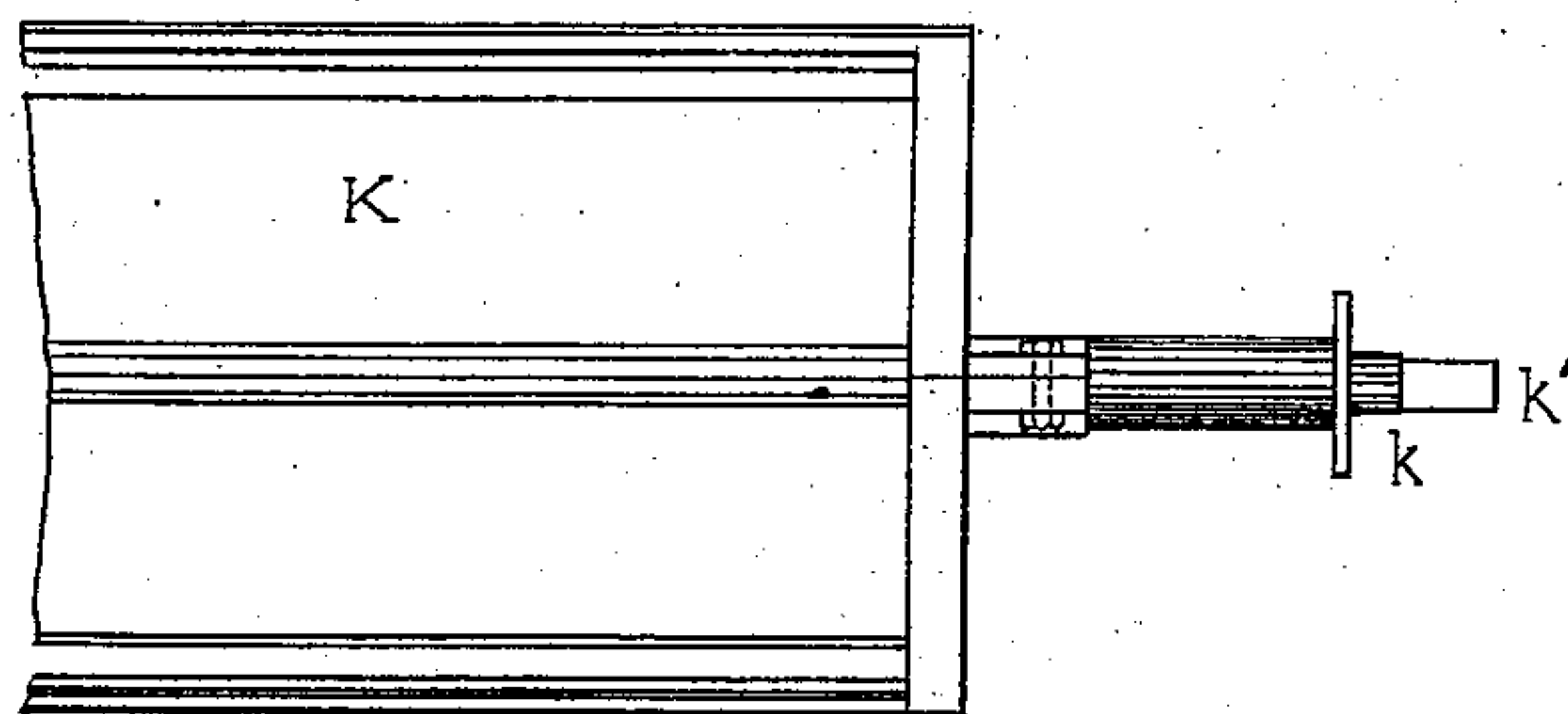


Fig. 3.

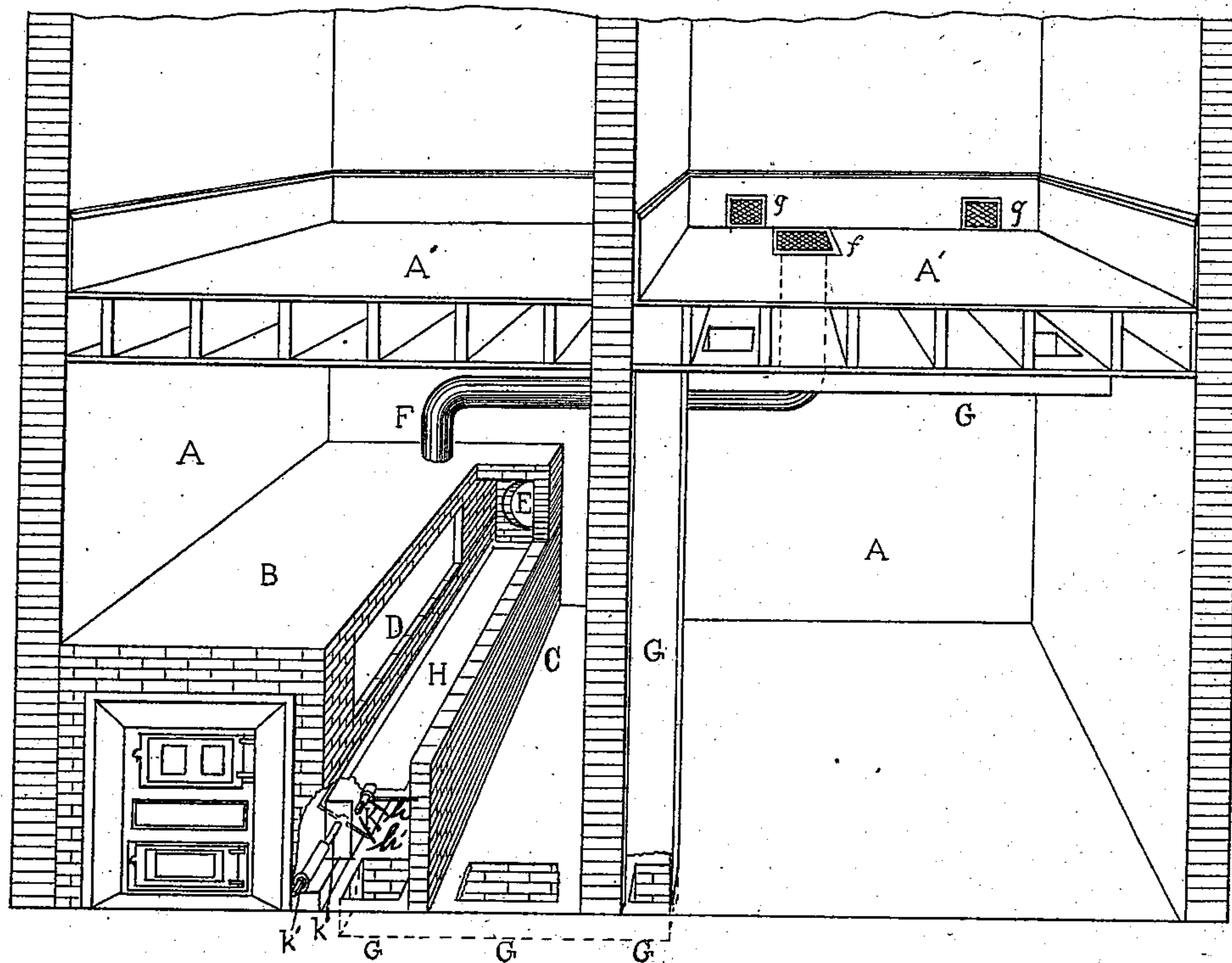


Fig. 1.

WITNESSES:

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HEATING AND VENTILATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 376,746, dated January 24, 1888.

Application filed March 15, 1887. Serial No. 230,946. (No model.)

To all whom it may concern:

Be it known that I, EDWIN T. JOHNSON, a citizen of the United States, and a resident of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented a certain new and useful Improvement in Heating and Ventilating Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to heating and ventilating apparatus, and has for its object quickly to obtain an initial temperature within the living-room by rapidly revolving the same air through a heating-chamber, and to obtain an efficient exhaust in the ventilating-shaft without the use of an extra fire therein.

My invention consists in the construction shown in the drawings, and hereinafter fully described and particularly claimed.

In the drawings, like letters referring to like parts, Figure 1 is a perspective view of the interior of a building, showing my invention in working position. Fig. 2 is a vertical section of one of the foul-air dampers and a part of the furnace-wall in which it is set, and Fig. 3 is a side elevation of a part of the same in position in the furnace-wall.

A A' are rooms or chambers in a residence or public building, of which A represents the furnace-chamber, and A' a living-room.

B is a furnace. C is a supplementary or annex chamber attached to said furnace, which may be formed by simply building an additional wall along one side of the furnace-wall at a short distance from the same and closing the top and ends. In the furnace-wall, adjacent to the annex C, I set a heat-radiating plate, D, composed of galvanized iron or other suitable material, for the purpose of radiating heat from the furnace into the annex chamber C. In the rear wall of the chamber C is a foul-air outlet, E, leading to the ventilating-shaft. (Not shown.)

F is a fresh-warm-air conduit leading from the heating-chamber of the furnace B to a register, f, in the living-room.

G is a foul-air conduit leading from the registers g, located near the floor of the living-room A', to the bottom of the forward end of the annex chamber C.

H is a damper set in the annex chamber C by journals resting in boxes in the end walls of the same. This damper, when in its horizontal position, divides the chamber C into an upper and lower section without intercommunication, and when in its vertical position the two sections open into one, constituting the chamber C. The forward journal, h, of this damper H is extended through its bearing-box, and is provided with the square end or wrench-head h', to which a crank-lever or wrench may be applied for turning the damper. K is a similar damper of equal length set in the furnace-wall adjacent to the annex chamber, pivotally supported by journals resting in boxes in the ends of the furnace wall. The forward journal, k, extends through its bearing-box to the front of the furnace, and is provided with a square end or wrench-head, k', similar to the damper H. This damper K is placed near the bottom of the furnace-wall, and when in its horizontal position it puts the heating-chamber of the furnace into communication with the bottom section of the annex chamber C and separates the two entirely when in its closed or vertical position.

The operation of my construction is as follows: If the dampers H and K be in the positions shown and a fire made in the furnace B, the air in the living-room A' will be drawn into the conduit G through registers g and down to and through the lower section of the chamber C into the heating-chamber of the furnace. In the furnace it will be heated and pass back to the room A' through the warm-air flue F. There is thus produced a system of revolving air from the room to be heated through the heating-chamber of the furnace. After the requisite initial temperature has been obtained in the living-room A' the damper K is closed and the damper H is opened. The air from the room A' then passes into the annex chamber C, and thence out through conduit E into the ventilating-shaft, and the fresh air is admitted to the heating-chamber of the furnace in the customary way and passes thence through the flue F to the living-room. The annex chamber C serves to give the necessary exhaust in the ventilating-

shaft. The body of air admitted to the annex chamber after it has been repeatedly passed through the furnace B is at a comparatively high temperature and has a strong ascensional power. This will be intensified by the heat radiated from the heating-plate D. The exhaust up the shaft is therefore started with a strong impetus, and is thereafter easily maintained by the heat radiated through the plate D.

It will thus be seen that my invention is of especial service in public buildings which are intermittently occupied or in which the fires are not constantly maintained, like school-buildings, churches, public halls, office-buildings, and similar structures. In this class of buildings the greatest difficulty is to warm the building in the first place. It is a tedious and costly operation to raise the building itself from the cold state to the required initial temperature. "After the heat is once up," as the engineers say, it is a comparatively easy matter to maintain it. The fires are always started in such buildings before the occupants come; hence change of air is unessential. The admission of fresh air may be postponed until the people arrive. It is far easier to heat one volume of air than many. I take advantage of these facts, and by revolving the same air continuously through the furnace I obtain the requisite initial temperature in much less time and at a greatly-reduced cost. It is also a

matter of considerable difficulty in such buildings to start the ventilation, on account of insufficient exhaust in the ventilating-shaft. The movement is very slow and sluggish at first. Most other systems seek to overcome this and get the initial draft by an extra fire in the bottom of the shaft. This is expensive. I dispense with it and get an equally good starting impetus by my system of revolving air and the annex chamber C.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

In combination, furnace B, provided with the radiating-plate D, hot-air flue F, annex chamber C, foul-air outlet E to the ventilating-shaft, conduit G from the living-rooms to said annex chamber, the damper H, journaled in the end walls of said chamber and serving to divide the same into an upper and lower section at will, and the damper K, journaled in the walls of said furnace and serving to connect or shut off said annex chamber from the bottom of said furnace, whereby the air from the living-rooms may be continuously revolved through the heating-chamber of said furnace, or be made to force its way into the ventilating-shaft at will, substantially as described.

EDWIN T. JOHNSON.

In presence of—

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EMMA ELMORE.