

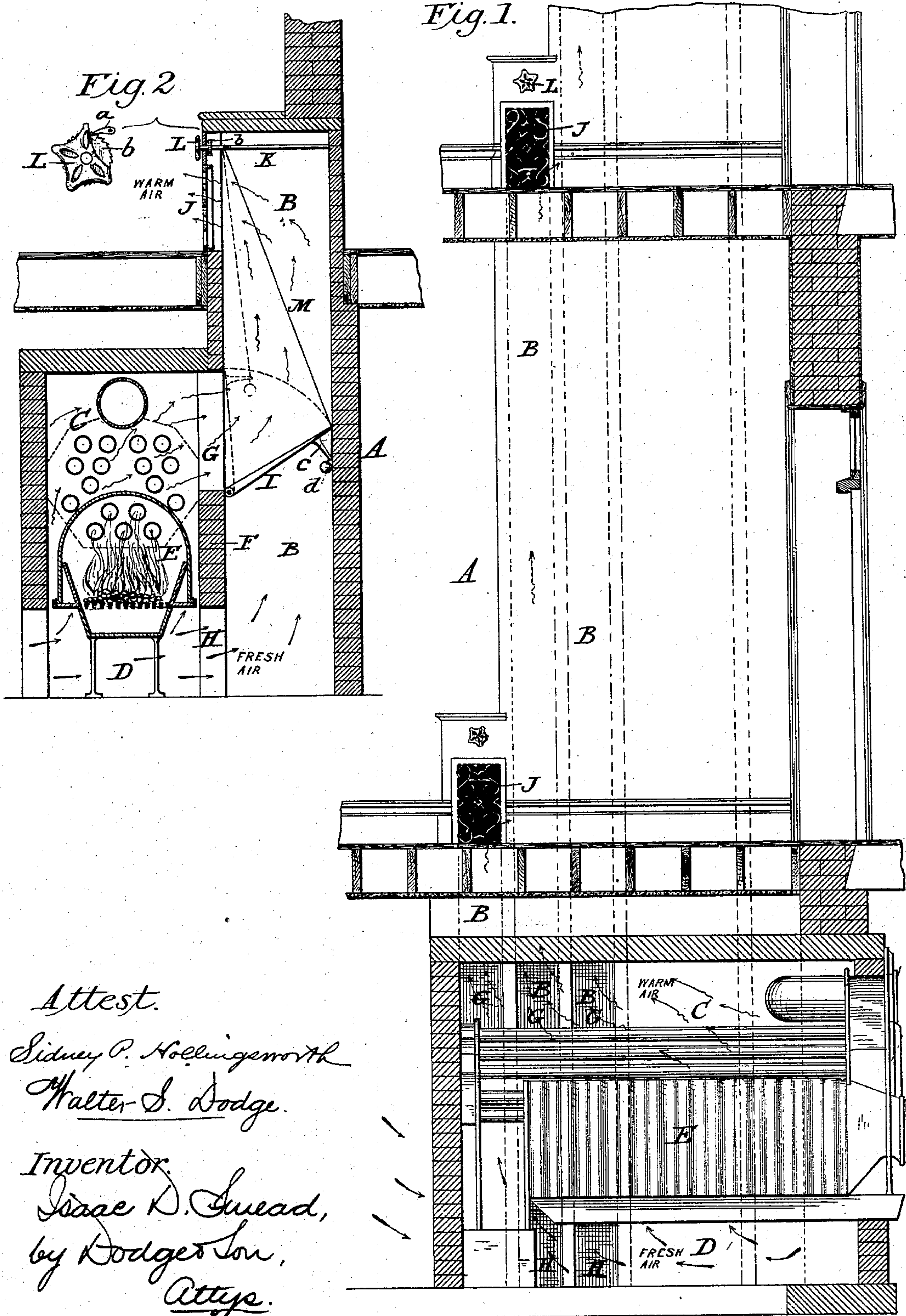
(No Model.)

I. D. SMEAD.

APPARATUS FOR HEATING AND VENTILATING BUILDINGS.

No. 261,879.

Patented Aug. 1, 1882.





# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR HEATING AND VENTILATING BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 261,879, dated August 1, 1882.

Application filed April 20, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC D. SMEAD, of Toledo, in the county of Lucas and State of Ohio, have invented certain Improvements in Heating and Ventilating Buildings, &c., of which the following is a specification.

My invention relates to the heating and ventilation of buildings; and it consists in a novel arrangement of the heating or furnace chamber, the flues, and the cold-air duct, together with a valve for each flue, by which I am enabled to simultaneously and by one operation shut off the supply of warm air and permit the entrance of cold air, shut off the supply of cold air and admit warm air, or admit warm and cold air mingled in any desired relative quantities.

It further consists in so constructing and arranging the operating and controlling devices of the valves that each may be operated from the room or story in which the temperature is to be regulated by such valve.

In the accompanying drawings, Figure 1 represents a sectional view of a portion of a building, passing through the heating-chamber and looking toward the air-flues, and Fig. 2 is a vertical transverse section through the heating or furnace chamber and lower portion of one of the flues.

The primary object of my invention is to enable occupants of rooms to perfectly regulate and control the temperature of the rooms, and to prevent persons ignorant of the laws of ventilation and of health from shutting out the necessary supply of fresh air, as is commonly done where the ordinary registers are used. To this end I adopt the construction and arrangement of parts shown in the drawings, in which—

A represents a building provided with air-flues B, a heating or furnace chamber, C, and a cold-air duct or inlet, D, opening into the furnace-chamber beneath the furnace E, as shown. The furnace-chamber is separated from the flues B by a wall, F, which is, however, provided with openings G at the top and openings H at the bottom of said chamber, by which communication is made between the chamber and the flues, as more clearly shown in Fig. 2, the upper openings being for hot air and the lower ones for cold air.

I represents a leaf or valve, of which there is one for each flue, hinged at its lower end or edge at the lower side of the warm-air opening G and adapted to be brought to a vertical position to close said openings, thereby establishing also an uninterrupted passage for cold air from below upward through the flue, or to be dropped down to an approximately-horizontal position, as shown in Fig. 2, to close the flue B and prevent the upward passage of cold air, at the same time opening the passage G and permitting hot air to pass freely into and up the flue. The valve or leaf may be adjusted to and held at any intermediate point, to permit a supply of both hot and cold air to pass up the flue, the inclination or adjustment of the leaf determining the relative quantities of hot and cold air. The valve or leaf I is made somewhat longer than the width of the flue, so that it may not fall below a given point. It will be seen that the volume of air thus permitted to ascend through each flue is essentially uniform and unvarying, whether it be all hot air, all cold air, or a mixture of hot and cold, and that while the temperature is perfectly controlled it is not at the sacrifice of ventilation and pure air. It is of course to be understood that each flue is furnished with an independent valve. The air passing up the flues B is delivered to the rooms through grated openings J, which need not, and usually will not, be provided with valves or closing devices, the regulation of temperature being effected wholly by the valves I.

For the purpose of operating the respective valves, I provide for each a shaft or spindle, K, furnished at the outer end with a hand-wheel or knob, L, and extending into or across the flue, as shown at Fig. 2; and I attach to this shaft or spindle one end of a chain or cord, M, the opposite end of which is attached to the free or moving end of the leaf or valve. It will be seen that under this construction it is merely necessary to turn the shaft, and thereby wind up or unwind the chain or cord, to raise or lower the valve, as desired. If necessary, a pawl or catch, *a*, may be employed to prevent the shaft from being turned by the weight of the valve, as shown, the pawl engaging with a ratchet, *b*, on the shaft. The regulating shaft or spindle of each valve is



placed in the room to which the flue controlled by said valve passes. It is apparent that the shaft or spindle may be cranked or provided with a radial arm and connected with the valve  
 5 by a rod or wire. Being heated by the passage of hot air through it, the flue B will, by giving off its heat and rarefying the air entering it, cause the cold air to rise when the hot air is shut off, and a current being thus estab-  
 10 lished, it will continue even after the flue becomes cool.

In order that the valve may be closed against its seat firmly and with certainty, an arm or horn, *c*, is attached to or formed upon the rear  
 15 face of the valve, and the chain or cord M is attached to the outer extremity thereof, as shown in Fig. 2. The strain or pull upon the chain will of course tend to bring the point of attachment of the chain to the arm into line  
 20 with the pivot or hinge of the valve and the point at which the chain leaves the spindle or shaft K, thus throwing the valve forward in advance of said line and pressing it to its seat.

I am aware that a heater has been arranged  
 25 within a chamber separated from the delivery-flue by a wall or partition having an upper and a lower opening, and furnished with a valve arranged to simultaneously open either of said openings and close the other to any desired  
 30 degree, and this I do not broadly claim. I, however, believe my arrangement of the valve to be new and better adapted to the end sought than such as have been heretofore proposed.

I do not broadly claim a valve arranged to  
 35 simultaneously cut off the flow of warm air and admit cold air, or to cut off the cold air and admit warm air; but I believe my construction and arrangement of the valve and its operating devices to be new. It is particularly  
 40 to be noted that under my arrangement each flue is furnished with a valve capable of adjustment or regulation independently of the others; that when the cold air is permitted to enter the flue the warm air is not permitted to

escape by the outlet of such flue from the fur- 45  
 nace-chamber, and that the same flue answers for both the warm and the cold air.

Having thus described my invention, what I claim is—

1. In combination with the furnace-chamber 50  
 provided with an air-inlet, D, one or more flues, B, each communicating with the furnace-chamber by passages G and H, and each furnished with a valve, I, having its lower end hinged at the lower end of opening G, whereby it is  
 55 adapted either to simultaneously open passage G and close the flue below it or to close the passage G and open the flue, as set forth.

2. In combination with a furnace-chamber and a flue, communicating as explained, the 60  
 valve I, arranged, as shown and described, to control the delivery of warm and cold air to the flue, hinged at its lower end, and provided with an arm, *c*, on its rear face, and a shaft or spindle located above the valve and connected with  
 65 arm *c*, as shown, whereby the movement of the shaft or spindle is caused to tightly close the valve against its seat.

3. In combination with opening G, the valve I, provided with a rearwardly-projecting arm, 70  
*c*, and a chain connected with the outer end of said arm, and with a winding or elevating device above the same, whereby the valve is pressed firmly to its seat and caused to close the opening G when the chain is drawn up- 75  
 ward.

4. In combination with the furnace-chamber, flue, air-inlet, and valve I, arranged as set forth and shown, a shaft or spindle above the valve, connected therewith as explained, and pro- 80  
 vided with ratchet *b*, and the pawl *a*, arranged to engage with the ratchet, and thereby to prevent the rotation of the shaft.

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Witnesses:

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