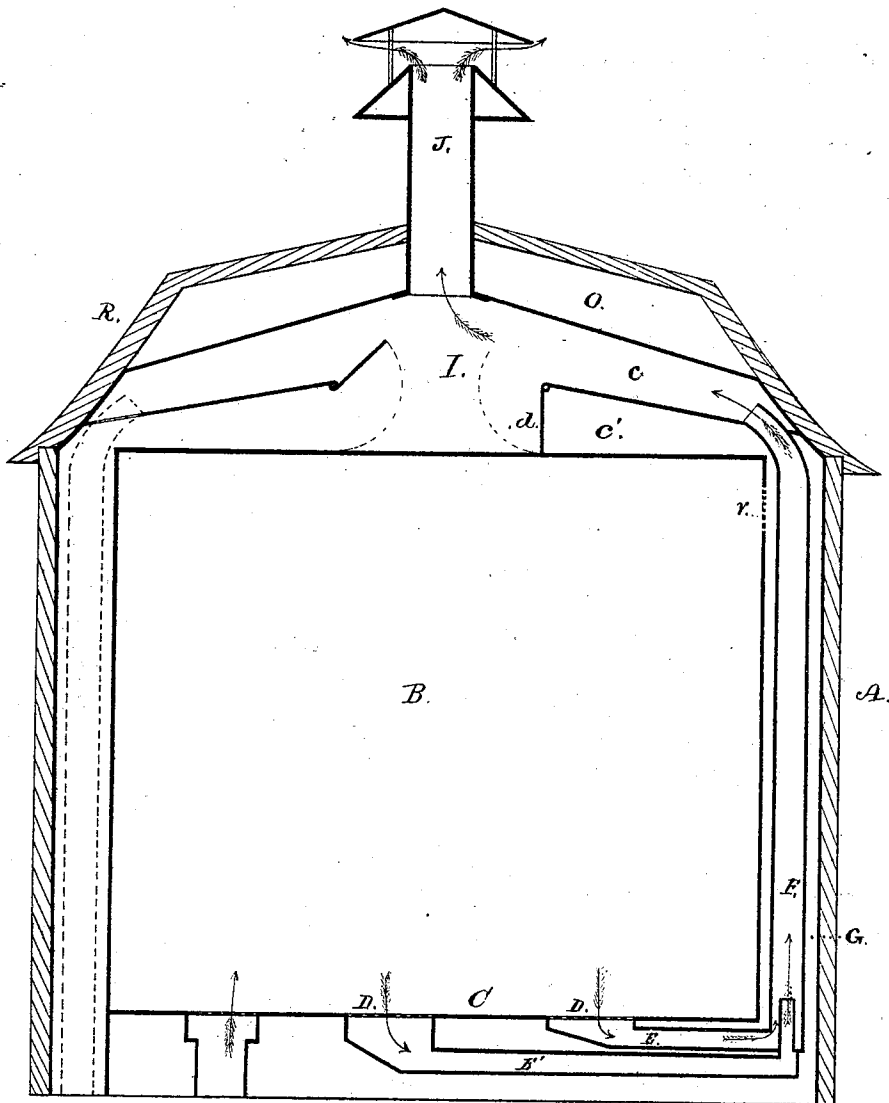


P. MIHAN.

Means for Ventilating Buildings.

No. 151,997.

Patented June 16, 1874.



Witnesses.
Geo Gray
S. L. Hale

Patrick Mihan.
by his attorney.
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UNITED STATES PATENT OFFICE.

PATRICK MIHAN, OF CAMBRIDGEPORT, MASSACHUSETTS.

IMPROVEMENT IN THE MEANS FOR VENTILATING BUILDINGS.

Specification forming part of Letters Patent No. **151,997**, dated June 16, 1874; application filed April 8, 1874.

To all whom it may concern:

Be it known that I, PATRICK MIHAN, of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Ventilating Buildings; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

The accompanying drawing denotes a central and vertical section of a building having a single hall or room provided with my improved ventilating apparatus, such drawing also showing, in dotted lines, an axially vertical ventiduct, which may lead from the same room and constitute a counterpart to its fellow, or may be supposed to lead from a room below, showing an arrangement that may be adopted in case the building to be ventilated should have more than one story. I would remark that my invention is applicable to buildings having any number of stories, and that each story is to have an independent system of foul-air ducts, whose upper ends open into a common receiving-chamber disposed in the attic or upper space of the building.

It is a fact well known to those cognizant with the construction, warming, and ventilation of large public buildings, churches, school-houses, &c., that the system of heating and ventilating as now employed is a very defective one, and that a great portion of the heat passes off with the lighter and purer air, while the major part of the foul and impure air (owing to its denser nature) is left suspended in the lower part of the room.

The object of my invention is to produce a more perfect system of ventilation, whereby the air of a room or series of rooms disposed one above another may not only be rendered purer and of a more equable temperature, but the heating of the same be effected at a great saving in the cost of fuel in comparison with the ordinary methods.

I am aware that the ventilation of a room by withdrawing therefrom the denser and foul air by means of registers located in or

near the floor, and connected by pipes to a common duct placed in and extending to the top of a chimney, so that the foul-air duct will be heated by the smoke and volatile products of combustion passing up the chimney, and thereby rarefy the air in the said ventilating-duct, so as to create a draft therein, is not new. This differs essentially from my system, in which I employ registers both at the top and bottom of each room, and cause the heated air of the room to effect its entire ventilation. This I accomplish by the combination and relative arrangement of the hot and foul air ducts and register, as hereinafter described and claimed.

In my system I form a dead hot-air space or chamber, which is filled with the heated air from the top of the room or rooms through its register or registers. Into this chamber or space, and so as to extend above the same, I dispose the main foul-air duct or series of such ducts, each of which is provided at its lower part with one or more separate flues or pipes opening into the same at a point above the register or plane of ingress, and in a line parallel with the axis of the main foul-air duct, and thus avoid any counter action as arises where two or more pipes open into the main foul-air duct in the same horizontal plane. By this arrangement I am enabled to produce a like degree of exhaust from all the floor-registers.

In the drawing, A denotes a building of one story, provided with a French or other roof, R. B is a hall or room located in the interior of such building. C is the floor thereof. D D are registers, which are arranged in the floor, although, if desirable, they may be placed in the mop-boards or lower part of the room. These registers cover the mouth of two separate independent horizontal foul-air ducts, E E', whose other ends open into a perpendicular duct, F, inclosed within a warm-air space or duct, G, disposed on or near the wall of the building. The duct F extends upward and opens into the upper compartment of a chamber, I, disposed in the attic O, or space under the roof. The chamber I communicates with the main ventilator J, as shown in the drawing. The lower horizontal duct E' is curved, and its eduction end extends up into the perpendicular duct F to a point a lit-

tle above its plane of inlet in the floor, the object of such being to afford to each of such ducts a like degree of exhaust. The casing or outer duct G is to receive the exhaust warm air, and has a register, *r*, disposed in the same, and near the top of the room. The upper end of the duct G extends up and opens into the lower compartment *c'* of the chamber I, the latter being provided with a damper, *d*, by which the escape of the heated air may be arrested or controlled, as circumstances may require. The drawing shows the chamber I as provided with two dampers, and with a cold foul-air and a hot-air duct applied on each side of the room, although but a single arrangement of such is necessary. Such may, however, be employed with a single room having a similar system of horizontal ducts, like that described, leading from the same floor; or, if the building has two or more stories, such duct may have its inlets disposed in the floor of any room. It is to be understood that each room, or each story, is to have a separate and independent series of foul-air ducts, whose main duct has its upper end extended up and opening into the chamber I, and above the hot-air part of such chamber. The damper or dampers of the chamber I may have any suitable device or mechanism for opening and closing them, it being understood, or intended, that such dampers shall be under the charge of the janitor of the building, and not the occupant of any single room, unless there is but one room in the building.

The hot air for heating the room or rooms is to be supplied from a furnace, or other suitable heater, by means of a register or registers in the floor in the ordinary manner, and the diminishing of the temperature in my system is to be effected by closing the heat-supplying registers more or less, as circumstances may require, rather than to open the top register and suffer the surplus heat to escape, as is the usual method.

I would remark that each hot-air register at the top of the rooms may open into one common outer duct or space surrounding the foul-air duct or series of ducts. So, also, the series of exhaust foul-air ducts and its enveloping hot-air duct may be disposed at one side of the building, or on opposite sides, or in any other desirable position.

By the arrangement of the damper or dampers in the chamber I, as described, the waste of the hot air into the main ventilator J is

prevented. The dampers being closed, the heat escaping from the register or registers at the top of the rooms is intercepted and stored in the lower part of the chamber I, the same serving to heat the foul-air compartment over it, and thus rarefy the air within such compartment, and thereby aid in promoting the exhaust of the foul air. By thus arranging the foul-air duct or ducts within the exhaust warm-air ducts, the former become so heated by the waste hot air from the latter as to produce a rarefaction of the air within the inclosed duct or ducts, and thereby create an accelerated current of foul air from the lower part of the room into and through such duct or ducts. So, also, by the arrangement of a series of registers over the foul-air inlets in the floor of each room, the concentration of the foul air at one point, as takes place when but a single register is employed, is prevented.

I do not claim locating registers or ventilators in the floor of a building, and connecting such with a special pipe or flue disposed in a chimney, and extending to the top thereof.

What I claim as my invention is—

1. In an apparatus for ventilating buildings, substantially as described, the combination of two or more separate foul-air ducts, E E', the main foul-air duct F, the dead-air space or duct G, and the registers *r* and D D, the whole being constructed and arranged substantially as shown and described.

2. In an apparatus for ventilating buildings, the combination of the separate foul-air ducts E E', the main foul-air duct F, the dead-air space or duct G, and the registers *r* and D D with the main ventilator J, substantially as shown.

3. As a means of producing equality of exhaust from each of the floor-registers, the combination and arrangement of two or more ducts, E E', as shown and described, leading from such registers, the lower one or ones opening into the main foul-air duct F at a plane above its or their induction end, as stated.

4. The combination, with the exhaust hot-air duct G, of the hot-air compartment *c'*, located as described, and provided with a damper, *d*, as and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

Witnesses: PATRICK MIHAN.

F. P. HALE,
SAML. TODD.