(No Model.) 2 Sheets—Sheet 1.

E. E. RICE.

Ventilating and Cooling Buildings.

No. 238,251. Patented March 1, 1881.

Fig. 1.

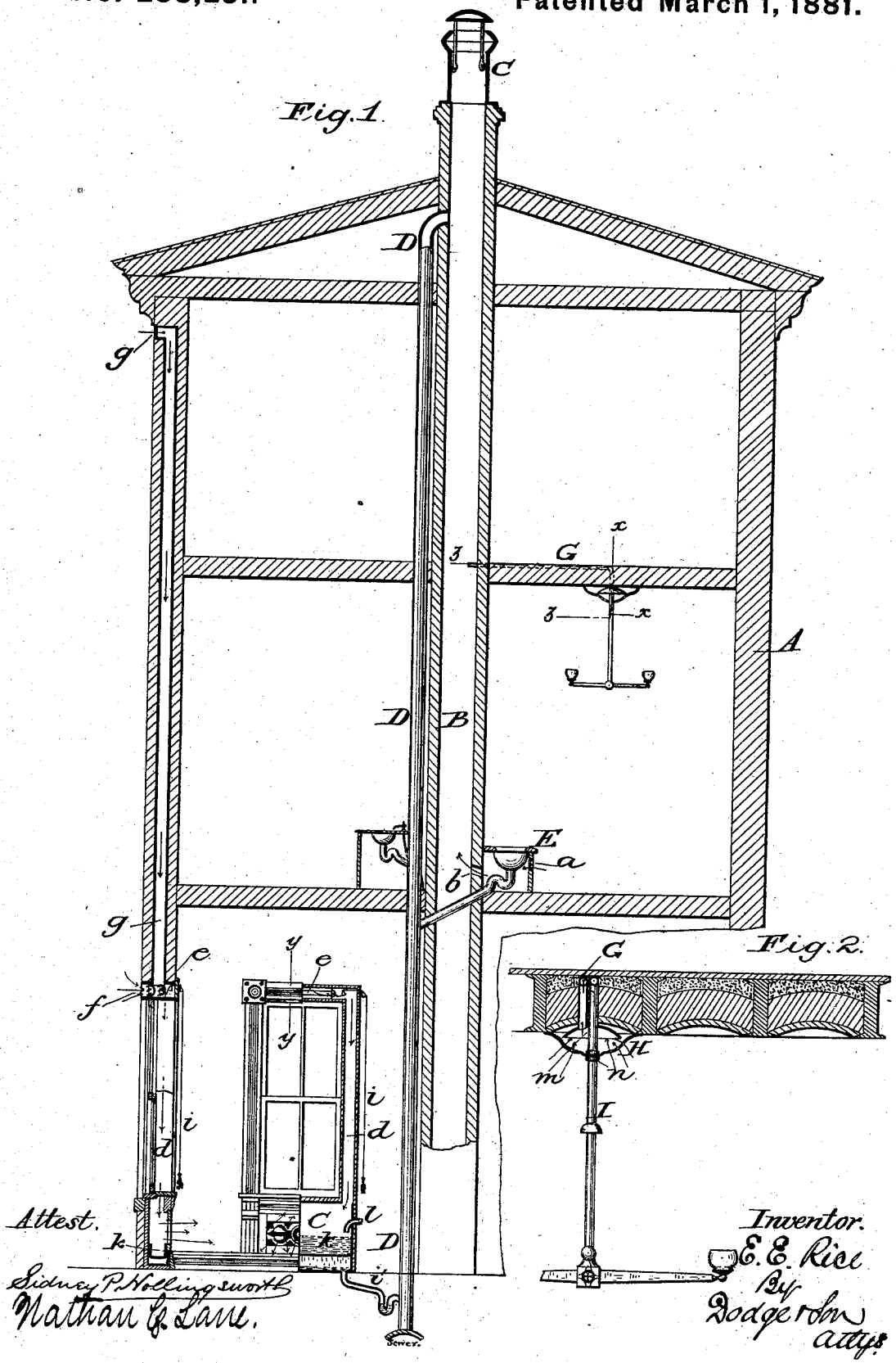


Fig. 2.

Attest.

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Nathan G. Lane.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

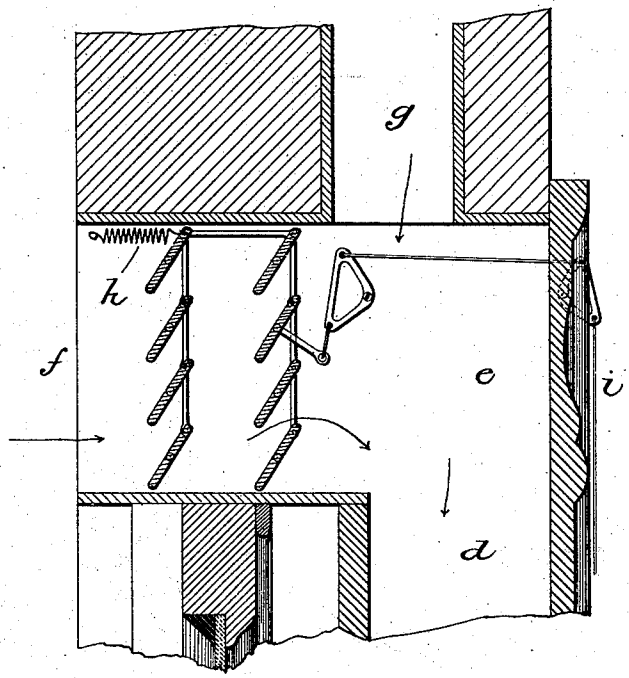
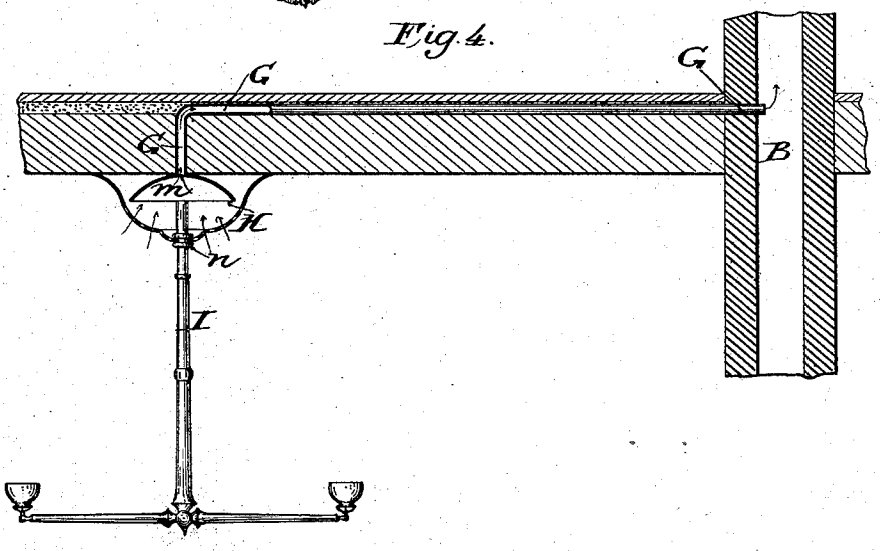


Fig. 4.



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UNITED STATES PATENT OFFICE.

ELISHA E. RICE, OF WASHINGTON, DISTRICT OF COLUMBIA.

VENTILATING AND COOLING BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 238,251, dated March 1, 1881.

Application filed September 3, 1880. (No model.)

To all whom it may concern:

Be it known that I, ELISHA E. RICE, of Washington, in the county of Washington, District of Columbia, have invented certain Improvements in Ventilating and Cooling Buildings, &c., of which the following is a specification.

The object of my invention is to secure a thorough ventilation of dwellings and other buildings, and to maintain a fixed and agreeable temperature therein; and to this end it consists in the special construction and arrangement of various details, the most important of which are: a ventilating flue or pipe extended upward through the building and connected with the chimney-flue immediately beneath the roof; a cooling and purifying chamber located beneath the window-sill and connected, by flues in the casing, with an outlet directly into the open air, and also with an inlet at the top of the building; a double register of peculiar construction, and discharge-flues arranged especially with reference to their use in fire-proof buildings of the usual construction, as hereinafter described in detail.

Figure 1 represents a vertical central section through a building provided with my improvements, a window in the farther wall being also shown partly in section. Fig. 2 represents a cross-section of the same on the line *x x*. Fig. 3 represents a section on the line *y y*. Fig. 4 represents a section on the line *z z*.

A represents a building of ordinary construction, and B a chimney through which the smoke and waste heat and gases from the stoves or furnace will be discharged, as usual, thereby keeping the chimney in a heated condition. Owing to the concentration of the heated air immediately beneath the roof of the building, and the ascent of the heated vapors within the chimney, the latter will have, I find in practice, the highest temperature immediately below the level of the roof.

On the top of the chimney I place a cowl or hood, C, of the pattern represented in the drawings, or of any other approved pattern which will prevent a downward current into the top of the chimney.

Within the building I erect a ventilating-flue, D, the lower end of which is connected with the sewer, while the upper end is introduced into the chimney immediately beneath the roof, as represented in Fig. 1.

The connection of the pipe to the chimney at the particular point indicated is of the utmost importance, and is a leading feature of my arrangement. When thus arranged the pipe, like the chimney, partakes of the elevated temperature existing near the roof-line, and the consequence is, that under all circumstances and conditions a free and rapid draft is maintained through the flue into the chimney. Another important advantage of the arrangement is, that the foul gases entering the chimney near its top cannot be driven out into the building through the fire-places and other openings.

I am aware that it is not new to employ a ventilating-flue extending from the sewer upward through the roof, and also that it is not new to lead a flue from the sewer into the lower part of a chimney, below the level of the upper fire-places, and therefore I do not claim, broadly, a flue leading from the sewer to the chimney; also, that it is old to carry ventilating-pipes from the water-closets on the various floors into a special flue starting at the ground, closed at the foot, and extending upward through the roof, as in English Patent No. 316 of 1873. My invention, in this regard, is limited to the connection of the flue and chimney at the particular point indicated, whereby I gain the advantages of an increased draft, security against the escape of the foul gases into the building, and certainty in the discharge of said gases. The word "chimney," as herein employed, is to be understood in all cases to mean a chimney or flue through which smoke and heated gases are discharged, or which is otherwise heated.

To the flue D, arranged as described, I connect, through the medium of trapped pipes, the various basins and water-closets on the different floors of the building, thus making the flue do service as a soil-pipe. The arrangement is such that all waste water from the interior of the building must pass through flue or pipe D to reach the sewer.

In order to prevent the escape of noxious gases from the water-closets, the bowls are inclosed in close casing in the ordinary manner, as shown at E, and communications *a b* established from the apartment into the casing, and

from the casing into the chimney, as indicated in Fig. 1. The opening *a* will be provided, as shown, with a register or damper.

For the purpose of introducing fresh air into the building and of purifying the air as it enters, I adopt the construction represented in Figs. 1 and 3. The window boxing or casing is constructed with a large space or chamber, *c*, beneath the sill, and with two side flues, *d*, extending upward from the chamber *c* to a cross-flue, *e*, at the top. From the flue *e* there are two openings for the admission of air—the first, *f*, opening directly through the wall to the exterior, and the second, *g*, extending upward in the wall and opening outward at the top of the building, as represented in Fig. 1. Air may be admitted through both inlets at once, or through the upright passage alone, the arrangement permitting the adaptation of the system to the varying conditions of the atmosphere and the changes in the temperature and the direction of the wind.

In order that the opening *f* may be closed when the air is to be admitted only through the flue *g*, it is provided with a register or damper, such as represented in Figs. 1 and 3, consisting of two sets or series of rolling slats connected with each other in such manner as to open and close simultaneously. The two series are arranged, as shown, at a slight distance apart, thus establishing a dead-air space between them. By this arrangement I prevent leakage, and also prevent the outside temperature when very low from affecting the proper draft downward through the vertical flue. Another advantage of the double register consists in the fact that it excludes dust and rain better than the ordinary single registers. A spring, *h*, or a weight will be applied to hold the registers shut, and a cord, *i*, hanging down within the apartment, will be connected with the register, as shown, to open the same and hold it open when desired. A knob or other fastening device will of course be provided to hold the cord. When the register is open the air will enter directly from the outside; but when the register is closed the air will descend through the flue *g*. In either case the air will pass down from the top through the side flues, *d*, into the chamber *c*, and thence through its front, which is perforated or slotted, into the apartment. The chamber *c* will be lined with metal, or otherwise rendered water-tight, and will be connected at its bottom, by a trapped pipe, *i'*, with the flue or soil-pipe D, as represented in Fig. 1.

Within the chamber *c* there is placed a water-vessel, *k*, supplied, through a pipe, *l*, with water, which overflows the vessel on all sides, and, falling to the bottom of the chamber, passes out through the pipe *i'*. The water serves in the chamber to cool and purify the air before it passes out into the apartment. During periods of very high temperature ice may be placed in chamber *c* to reduce the temperature.

For the purpose of removing the impure and vitiated air from the apartments, I make use of a pipe leading from a point in the ceiling directly over the gas-burners to the chimney. The arrangement represented is specially designed with reference to application in those fire-proof buildings in which the floors consist of parallel iron beams having brick arches built between them, and the invention in this regard consists in the peculiar arrangement shown.

In introducing this part of the invention I proceed to the floor above that on which the room to be ventilated is located and remove the stone covering or tiling of the floor from a point immediately over the gas-burner of the room below to the chimney. I then cut into the cement covering the brick arch of the flooring, or partly into the arch, if required, a groove or channel, and drill a hole down through the floor and through the ceiling of the room beneath, over the gas-burner. I next provide a pipe or tube, G, and seat the same in the groove or channel, passing one end into the chimney and the other down through the hole into the lower room, as shown. After this has been done I fill in with cement around the pipe, replace the floor above the same, and proceed to the apartment below. In the lower apartment I attach to the end or mouth of the pipe G a mouth-piece, *m*, of concave form on the under side, to direct the heated air into the pipe. Beneath and around the mouth-piece or concentrator *m*, I place an ornamental perforated center-piece, H, to conceal the same, securing the center-piece in place by mounting it around the gas-pipe I, and screwing a flange or collar, *n*, upon the pipe, beneath the center-piece, as shown.

Having thus described my invention, what I claim is—

1. The combination of a building having a chimney, a sewer or drain pipe below the same, and an upright pipe extended from the sewer upward within the building and introduced into the chimney at a point immediately beneath the roof, as contradistinguished from any other point.

2. The combination of the building with its chimney, the sewer, the soil-pipe or flue extending from the sewer to the chimney at a point immediately beneath the roof, and the closets and basins, all connected with said pipe by trapped connections, as shown.

3. The combination of the chamber beneath the window, the side flues extending upward therefrom, and the two air-inlets, constructed and arranged as shown, and connected with the side flues.

4. In combination with the air-inlet, the double register, consisting of the two series of pivoted slats arranged at a distance from each other, and connecting mechanism, substantially such as described, whereby all the slats are opened and closed simultaneously.

5. In combination with the chamber formed

beneath the window and the side flues extending upward past the same, the flue *g*, leading upward to the top of the building.

6. The combination of the chamber located beneath the window and opening into the apartment, the side flues, and the top flue provided with the register communication with the outside air, as shown.

7. In combination with the air-chamber located beneath the window and provided with the air inlet and outlet, as described, the water-box therein and the water supply and discharge pipes, arranged as shown.

8. In ventilating buildings, the combination, with the chimney, of pipes communicating therewith and extending beneath the floors into the compartments at or near the center thereof, and then downward through the ceiling, and a mouth-piece adapted to direct the heated air into said pipe, substantially as set forth.

9. The ventilating system consisting of the chamber *c* near the floor, the side flues, and the air-inlets thereto, combined with the outlet-flue extending from the ceiling to the chimney, as described, whereby the introduction and circulation of fresh air and the removal of the vitiated air is secured.

ELISHA E. RICE.

Witnesses:
P. T. DODGE,
GEO. F. GRAHAM.