(No Model.) 3 Sheets—Sheet 1.

S. SHAW.

VENTILATING DEVICE.

No. 269,236. Patented Dec. 19, 1882.

Fig. 1.

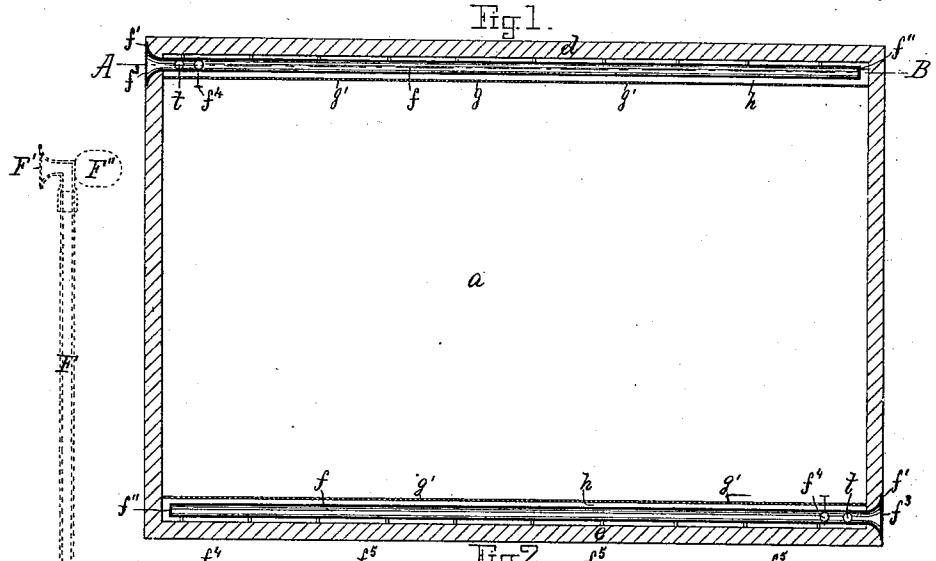


Fig. 2.

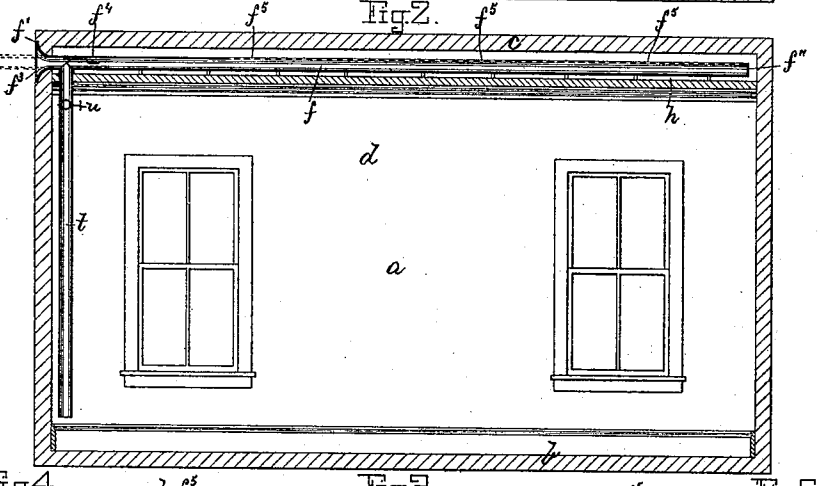


Fig. 4.

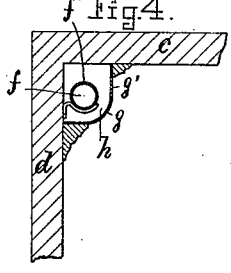


Fig. 3.

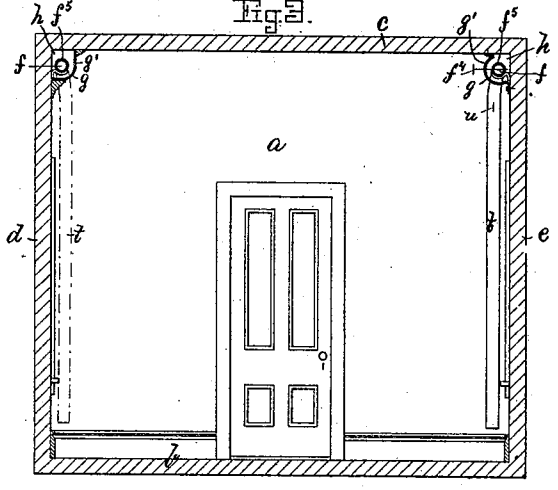
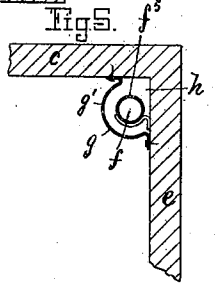


Fig. 5.



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VENTILATING DEVICE.

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Fig. 7.

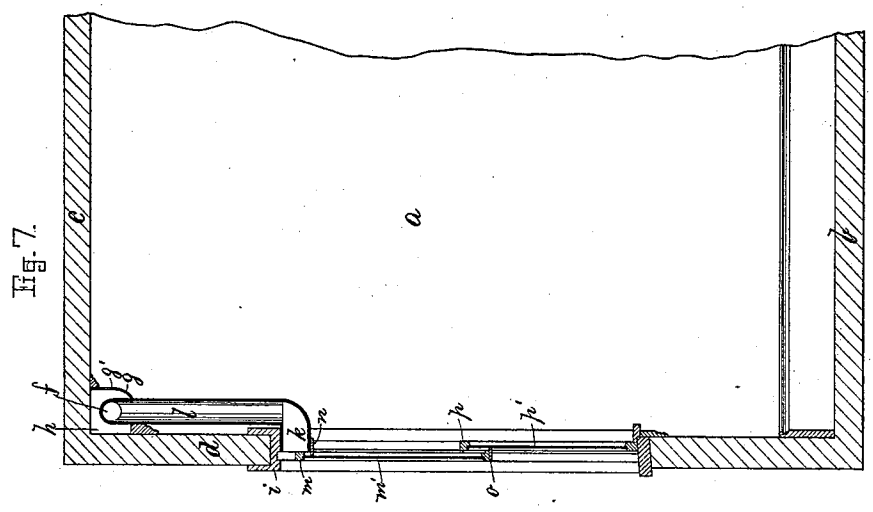
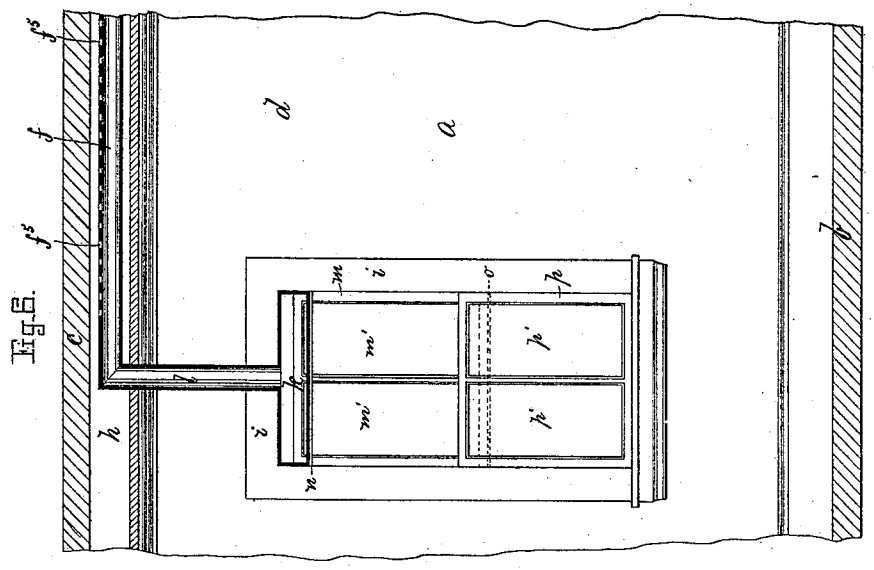


Fig. 8.



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(No Model.) 3 Sheets—Sheet 3

S. SHAW.

VENTILATING DEVICE.

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Fig. 8.

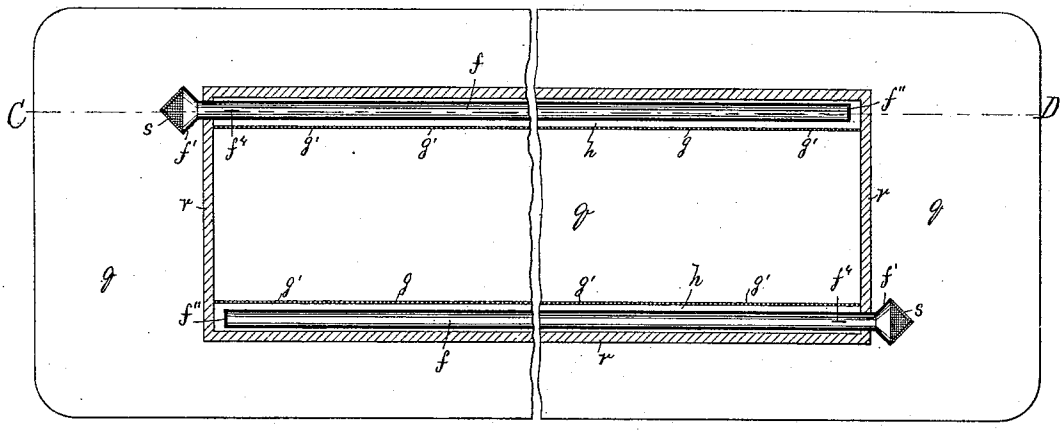


Fig. 9.

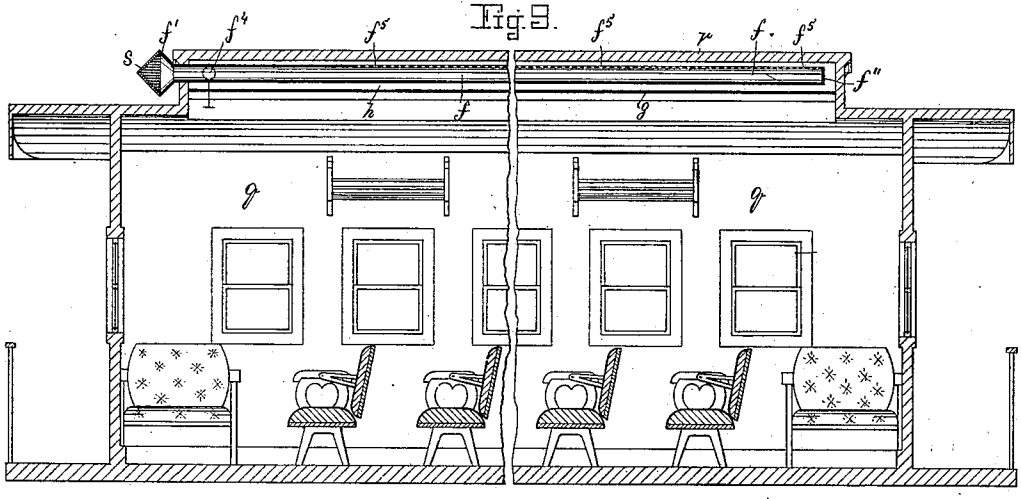
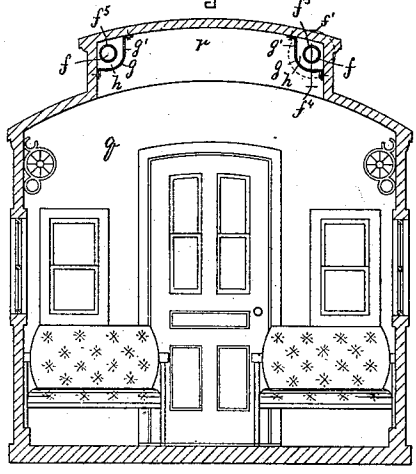


Fig. 10.



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UNITED STATES PATENT OFFICE.

SUMNER SHAW, OF BOSTON, MASSACHUSETTS.

VENTILATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 269,236, dated December 19, 1882.

Application filed April 15, 1882. (No model.)

To all whom it may concern:

Be it known that I, SUMNER SHAW, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Ventilating Devices; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

This invention relates to improvements in ventilating devices for rooms, halls, railway-carriages, and ships' cabins, and it is carried out as follows, reference being had to the accompanying drawings, on which—

Figure 1 represents a horizontal sectional view of the improved ventilating device arranged in a room or building. Fig. 2 represents a vertical section on the line A B. (Shown in Fig. 1.) Fig. 3 represents a cross-section. Fig. 4 represents an enlarged sectional view of the upper left-hand corner of Fig. 3, and Fig. 5 represents a similarly enlarged sectional view of the upper right-hand corner of said Fig. 3. Figs. 6 and 7 represent, in a longitudinal section and cross-section, a modification of the invention as applied to windows of rooms or apartments. Fig. 8 represents a horizontal section of the ventilating device as applied to a railway-carriage. Fig. 9 represents a longitudinal section on the line C D, (shown in Fig. 8;) and Fig. 10 represents a cross-section of the carriage and ventilating device shown in Figs. 8 and 9.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

The object sought to be attained is to admit fresh and pure air automatically to any desired room or apartment, and at the same time to expel from such room or apartment its foul and impure air, and thus to obtain a thorough means for ventilating the rooms.

Another object which I have in view is to prevent sudden drafts or puffs of cold air to enter the room during the time it is ventilated, for which purpose I arrange the air-inlet pipes near the ceiling in rooms or railway-cars, and in very high-studded halls or churches, or public buildings, at a proper height according to the size and stud of such public rooms. I arrange in each room or apartment a pair of such pipes, each of which passes in one end through the wall to the outer atmosphere, and in its other end it is closed. The said pair of pipes are located in opposite directions to each other—that is, the open end of one pipe projects through one side or end of the room, and the open end of the other pipe projects through the opposite side or end of the room, by which arrangement the outer air is forced into one or the other of said pipes, according to the direction of the wind. Both of said pipes are perforated on their upper parts, by which arrangement the cold, fresh air forced into the pipes is first divided up into numerous fine currents and blown upward against the ceiling or other equivalent obstruction—as, for instance, against a suitable shield in case the pipe is located some distance below the ceiling, which may be desirable in very high-studded halls or public buildings. After the fresh air is forced gently upward, as described, it is desirable that it should be mixed up and forced gently in a horizontal (or nearly so) direction, toward the central portion of the upper part of the room, and in so doing to be again finely divided before it is allowed to descend gradually toward the floor of the apartment, and for this purpose the pipe is inclosed within a shield or larger pipe, leaving a suitable space between the outside of the ventilator-pipe and the inside of the shield, the latter being provided with a number of fine perforations on the side toward the middle of the room.

In the use of my improved ventilating device, according to the state and direction or force of the wind, one pipe serves for the inlet of the outer fresh air and the other pipe serves for the outlet of the impure air from the room. If the direction of the wind changes, the functions of the inlet and outlet pipes are reversed—that is, the one which served as an outlet becomes the inlet-pipe, and vice versa. Similarly in using the improved ventilating device on railway-carriages, one pipe has its open end pointing toward one end of the carriage and the other pipe has its open end pointing in the opposite direction, so that no matter in which direction the carriage is traveling fresh air is forced in through one pipe and foul air forced out through the other; and to prevent snow, dust, and cinders from entering the carriage, I provide the outer ends of each pipe with a conical and perforated hood, made of wire-gauze or similar perforated material. In buildings I

prefer to cover the open end of each pipe with a sheet of wire-gauze or similar perforated material.

If so desired, the inlet and outlet of the air may be controlled and regulated by means of suitable valves or cut-offs on the ventilating-pipes.

In Figs. 1, 2, and 3, *a* represents a room or apartment; *b*, its floor; *c*, its ceiling, and *d* and *e* two opposite sides or ends of such room.

f f represent the ventilating-pipes, with their open, flaring mouths *f' f'* pointing in two opposite directions, as shown, their other opposite ends, *f'' f''*, being closed, as and for the purpose set forth.

f^3 is the perforated screen or netting covering the open end *f'* of each pipe, so as to prevent snow, dust, cinders, &c., from passing into the said ventilating-pipes.

f^4 is a suitable valve or cut-off, located near the open end of each pipe *f*, by means of which the amount of air admitted to the room may be regulated or cut off altogether.

f^5 are perforations on the upper side of each ventilating-pipe *f*, as and for the purpose set forth.

g is the shield or cover which incloses the pipe *f*, in whole or part, in such a manner as to leave an air-chamber, *h*, between it and the pipe *f* for the purpose set forth.

In the drawings, the air-chamber *h* is shown as being bounded in part by the shield *g* and in part by the corner at the junction of the ceiling and wall of the room; but I do not wish to confine myself to this exact arrangement, as the shield *g* may be made annular, so as to encompass the pipe *f* all around it.

g' g' are perforations on the side of the shield toward the room, as and for the purpose set forth.

In case the room or building to be ventilated is located in a low position—as, for instance, when surrounded by higher buildings or natural objects—I may prefer to connect the mouth *f'* of the ventilator-pipe *f* to an upright pipe, F, having at its upper end a rotary mouth-piece, F', and fan-tail F'', as shown in dotted lines in Fig. 2, so as to cause the wind above the building to be conducted by these means to the ventilator-pipe *f*.

In Figs. 6 and 7 I have shown a modification for connecting the open upper space of a window with the ventilator-pipe *f*, for which purpose I arrange at the upper part of the window-frame *i* a mouth-piece, *k*, of equal width with the inside of said window-frame, as shown in Fig. 6. Said mouth-piece is connected to the pipe *f* by means of the vertical pipe *l*, by which means a fresh current of air is forced from the outside when the upper window-sash, *m*, is lowered a little, through the mouth-piece *k* and vertical pipe *l* into ventilator-pipe *f*, and from the latter into the room, as hereinbefore has been described. To prevent dust, dirt, or snow from entering the room when the upper window-sash, *m*, is lowered, as shown in Figs. 6 and 7, I attach to the under side of the mouth-piece *k* a strip of rubber, *n*, or other suitable material, which is adapted to lie air-tight against the upper glass pane, *m'*. In a similar manner I attach to the lower edge of the upper sash, *m*, a strip of rubber, *o*, or other suitable material, which is adapted to lie air-tight against the lower glass pane, *p'*, in the sash *p*. By raising the sash *m* so as to close the window the mouth-piece *k* is also closed. This modification is very useful and practical where it may be inconvenient to make holes through the walls for the outer ends of the pipes *f f*, as the same beneficial effect is obtained by connecting the pipes *f f* to two or more windows arranged opposite to each other or nearly so, and this modification is consequently very well adapted for buildings already erected.

For buildings in process of being erected I may prefer to arrange the device in the manner as shown in Figs. 1, 2, 3, 4, and 5.

Figs. 8, 9, and 10 show the device as arranged on a railway-carriage, in which *q* is the carriage, with its monitor-roof *r*, as usual. In the latter I locate the perforated pipes *f f*, with their flaring mouths *f' f'* pointing in opposite directions, and provide them with perforations f^5 on their upper sides, and with a perforated screen or netting, *g*, for each pipe, having perforations *g'* on the side toward the middle of the carriage, in the same manner as described in relation to Figs. 1, 2, 3, 4, and 5. On railway-carriages, however, I prefer to provide the open mouths *f' f'* of the pipes *f f* with conical screens or nettings *s s*, so as to more effectually exclude dust, smoke, dirt, cinders, or snow. One pipe serves for the inlet of fresh air and the other serves for the exit of the impure air, according to the direction in which the carriage is traveling.

In buildings or houses having main halls or passage-ways a pair of ventilating-pipes may be located in each hall or passage-way and branch pipes led from such main pipes in the hall to each room or apartment on the same floor without departing from the spirit of my invention.

For the purpose of automatically drawing off from the room the cold air that settles at or near the floor I provide each of the ventilator-pipes *f f*, near their outlets, with a downwardly-projecting pipe, *t*, passing down near the wall, or, in new buildings, between the walls to near the floor, each such pipe being open in its lower end and connected in its upper end to each pipe *f*, as shown in Figs. 1, 2, and 3, each such pipe *t* being provided with a packed air-tight valve, *u*, which will always remain closed unless purposely left open, and may be regulated to be kept open as much or as little as the occupant of the room may desire. The improvement may be used successfully in ships' berths and cabins.

What I wish to secure by Letters Patent and claim is—

1. In a ventilating device, the combination of two pipes, *f f*, having their open ends *f' f'* arranged in opposite directions, closed in their

other ends, and provided with perforations f^5 on their upper sides, with the air-chambers h h, and shields or envelopes g g, having perforations g' g' on their sides, as and for the purpose set forth.

2. In a ventilating device for railway-carriages, the combination of two or more ventilating-pipes, f f, closed at opposite ends and provided in their open ends with cone-shaped perforated or netted hoods or screens s s, to keep out cinders, smoke, and dust, as herein described.

3. The combination of two or more ventilating-pipes, f f, open at opposite ends and closed at their other ends, the downwardly-projecting pipes t t, connected in their upper ends near the open mouths of the upper horizontal pipes, f f, and made open in their lower ends at or near the floor, as and for the purpose set forth.

4. In combination with two or more ventilating pipes, f f, and the downwardly-projecting pipes t t, arranged as described, the valves or cut-offs f^4 f^4 and u u, as and for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

SUMNER SHAW.

Witnesses:

ALBAN ANDRÉN,

HENRY CHADBOURN.