

J. M. PALMER.

Ventilation of Cars and other Apartments.

No. 147,784.

Patented Feb. 24, 1874.

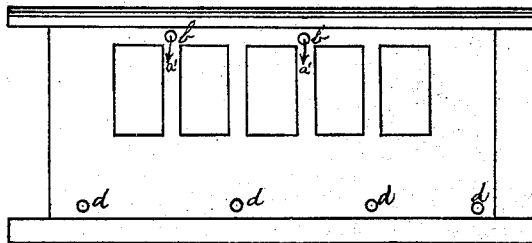


Fig. 1.

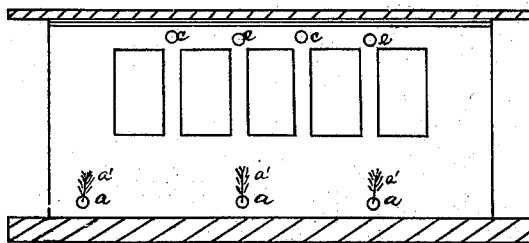


Fig. 2.

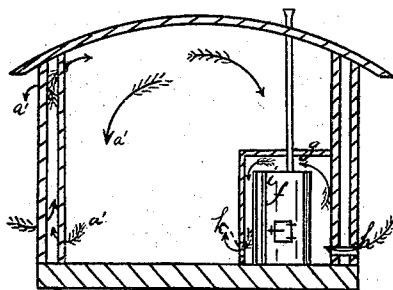
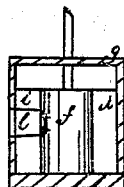


Fig. 3.



Witnesses:
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Wm. Henry Clifford.

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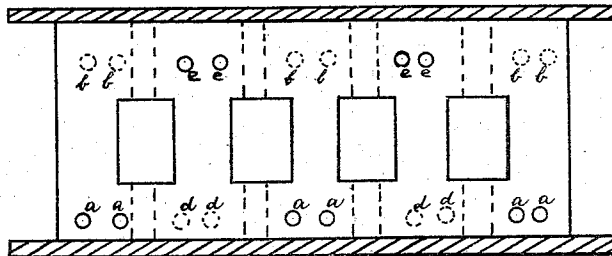


Fig. 4.

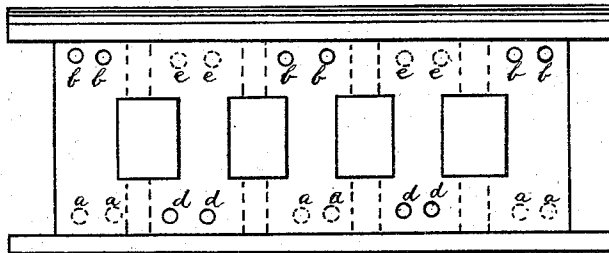


Fig. 5.

Witnesses:—

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Inventor:—

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UNITED STATES PATENT OFFICE.

JAMES M. PALMER, OF PORTLAND, MAINE.

IMPROVEMENT IN VENTILATION OF CARS AND OTHER APARTMENTS.

Specification forming part of Letters Patent No. **147,784**, dated February 24, 1874; application filed December 8, 1873.

To all whom it may concern:

Be it known that I, JAMES M. PALMER, of Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Ventilation of Cars and other Compartments; and I do hereby declare that the following is a full, clear, and exact description thereof, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of the outside of a car. Fig. 2 is a side elevation of the inside of a car. Fig. 3 is an end view, in section, with the end of the car removed and showing the stove. Fig. 4 is an inside view of a car, showing the arrangement and alternation of the apertures, the studding being indicated by the dotted lines, and showing the subdivided inter-wall spaces. Fig. 5 is an outside view of the same.

My invention has for its object the efficient ventilation of cars and other compartments without subjecting the same to rapid or sudden changes of temperature; and it is intended to accomplish this in one form by the use of a stove or heating apparatus, and in another without the employment of a stove. My invention aims to produce a constant and even motion and change of the atmosphere of a compartment-car, or apartment, whereby the vitiated air is continuously passing away, and thereby necessitating the entrance of pure air to supply its place.

The methods and devices by which I accomplish this object are the subject of this application and will now be described.

I employ as air passages or conduits of both the vitiated and the fresh air the spaces between the inner and outer walls of buildings and structures in connection with certain apertures in said inner and outer walls, which said apertures will be hereinafter described. The space between the walls, it is well known, in structures of wood are divided by the studding into narrow subdivisions, which extend a distance equal to that from the floor to the ceiling of the apartment. Where such do not exist, special conductors can be applied com-

municating between the apertures, as desired. First, as to the method of the expulsion or exit of impure air from the car or apartment: The impure air is chiefly that which, having been inspired and exhaled, consists largely of carbonic-acid gas. This, on account of its greater specific gravity, settles to the bottom of the car or room. For the purpose of removing this, I make, near the floor of the apartment, apertures in the inner wall thereof, and conducting into the space between the inner and the outer wall. These lead into certain of the subdivisions of the space between the walls made by the studding. Passing through these apertures the vitiated air enters the space between the two walls, in and through which space, being carried by the general movement of the air in the room, or circulation of air, (the full causes of which will be hereinafter described,) it rises or is caused to rise, and be finally conducted into the open air through apertures in the outer wall of the structure. These apertures lead into the open air from those subdivisions of the interwall-space made by the studding, into which the apertures just before described conduct the bad air from the interior of the apartment.

In the accompanying drawings, *a* shows the apertures in the inner wall; *b*, those in the outer wall, and the course of the vitiated air is indicated by the arrows *a'*. I provide for the exit of heated air by apertures near the top of the walls of the apartment communicating with those through the outer wall, which I have just described as being used to permit the exit of the vitiated or breathed air. These may be opened or closed at the pleasure of the occupant. These may be seen at *c*. In warm weather, for the purpose of admitting fresh air into the car, I employ the apertures *d* through the exterior wall of the car, and also conducting into the space between the inner and outer walls. To supply the place of such of the air as has been used and expelled in the manner above described, the air from without entering these apertures *d*, and rising in the space between the two walls, is admitted into the car or apartment through apertures placed at *e* in the inner wall of the same. Thus it will be seen that a continuous and equable motion or circulation of the atmosphere of an

apartment is maintained by the subsidence and exit of breathed air, and the entrance and gradual descent of pure air from without. These are made so as to lead into different subdivisions of the interwall-space from those into which the apertures *a* and *b* conduct.

It will be observed that all the spaces between the two walls, with the exception of those occupied by windows, &c., is rendered available as air-passages. It may be said, however, that conductors or tubes may be used, if desired, either between the two walls of the structure, or placed within or without the structure, and provided with the apertures, as herein described, when speaking of the two walls. The apertures for the admission of fresh air into a car, for instance, may be placed in every other space between the windows, and those for the exit of the breathed air may alternate with these through the inner walls of the structure.

In weather which requires the use of a heating apparatus—as, for instance, a stove—the following arrangement can be made for introducing into the car or apartment heated air, which is also pure and fresh. To accomplish this purpose, I surround a stove of convenient construction with an envelope or covering of metal sufficiently greater than the stove in height and diameter. The stove is shown at *f*, and the covering or envelope at *g*. This envelope, at the bottom and on the side next to the wall of the car, communicates with the open air by means of the conduit or aperture *h*. On opposite sides of the stove, and extending from the outside thereof to the inside of the covering *g*, are the wings *i*. These, it will be observed, extend no higher than the top of the stove. The effect of the heat of the stove is to create a current of air, which, entering through the aperture *h* fresh from without, passes up over the top of the stove, and is thrown or distributed into the car or other apartment through proper apertures *k*. *l* shows a box leading to the door of the stove through the outer envelope *g*. Apertures may be made through this to admit the air for the proper supply of the same to the fire. Thus a constant supply of pure warm air is afforded to the apartment.

The apertures herein described, in each of the forms of my invention, may be furnished with a fine wire-gauze to prevent the passage

through them of cinders, &c., and these may be protected by outer plates of metal having perforations therein, or by devices similar to the covering of common heating-registers.

The apertures for the final exit of the vitiated air may be provided with devices like the ordinary rotary chimney-tops, in order to facilitate the current; or, where the apertures open horizontally through the walls of the car or building, a rotating plate or similar device may be used to obtain a similar effect.

I do not claim, in combination with a heated pipe, a cold-air box or passage for the admission and conduct of fresh-warmed air into an apartment, as claimed in patent of S. M. Stone, No. 30,938, of 1860, however the same be arranged. Neither do I claim means for effecting a distributed exhaust in connection with a forced exhaust, nor mixing heated air with incoming cooler air, nor, broadly, a combination of a forced exhaust with supply-passages, as claimed in patent of E. L. Roberts, No. 79,395, of 1868. I also disclaim the use of cylinders or hollow ribs extending around the interior of a car to admit fresh air into the same, as set out in patent of E. Y. Robbins, No. 83,731, of 1868. I do not claim by itself the use of interwalled spaces for the purpose of ventilation. I do not claim the apertures near the top of an apartment for the exit of overheated air.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement of apertures, as illustrated at *a*, *b*, *d*, and *e*, in connection with the interwall-spaces of apartments, the said spaces being subdivided, as shown and described, and the different sets of apertures *a b* and *d e* being arranged relatively to each other, as set forth.

2. The arrangement of the apertures *a* and *b* for the exit of breathed air, and the subdivided interwall-spaces, in combination with the stove *f*, envelope *g*, wings *i*, and conduit *h*, for the introduction of warmed fresh air into an apartment in cool weather, as herein described.

In testimony that I claim the foregoing, I have hereunto set my hand this 29th day of November, 1873.

Witnesses: JAMES M. PALMER.
WM. HENRY CLIFFORD,
FRANK H. JORDAN.