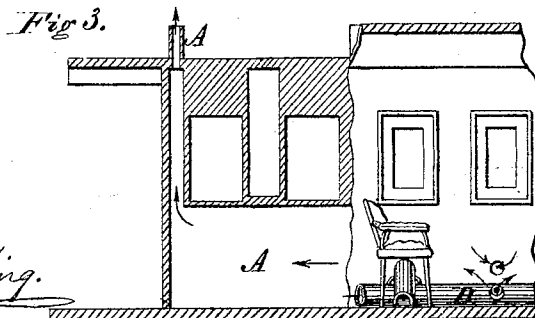
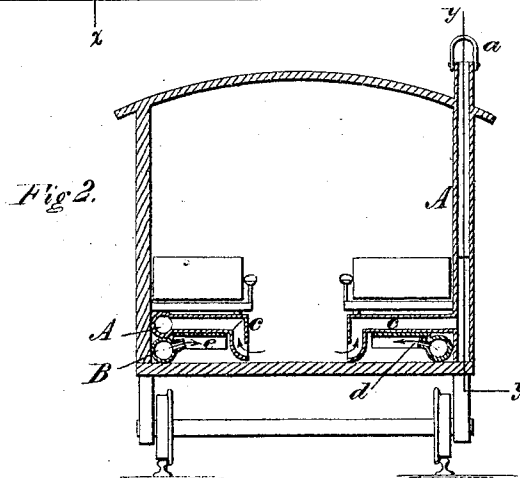
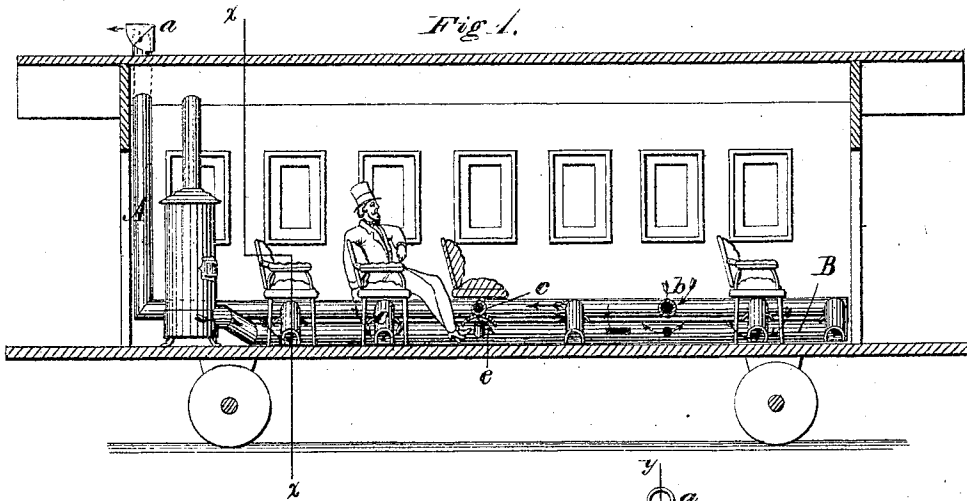


J. G. ALLEN.
Ventilating Railroad Cars.

No. 141,617.

Patented August 12, 1873.



Witnesses.

Harry King.

W. W. Dodge.

Inventor.

J. G. Allen.
By Dodge & Son
Attys

UNITED STATES PATENT OFFICE.

JOSHUA G. ALLEN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN VENTILATING RAILROAD CARS.

Specification forming part of Letters Patent No. **141,617**, dated August 12, 1873; application filed October 11, 1872.

To all whom it may concern:

Be it known that I, JOSHUA G. ALLEN, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Ventilating Railroad Cars, of which the following is a specification:

My invention relates to an improved method of ventilating railroad cars; and consists in a novel manner of arranging ventilating-flues to carry off the lower stratum of air, and in a novel manner of combining these flues with a well-known method of introducing currents of heated air.

Figure 1 is a longitudinal central section through a car arranged on my plan. Fig. 2 is a transverse vertical section of the same; and Fig. 3 is a longitudinal section, showing a modified arrangement of the ventilating-flue.

In carrying out my invention, I locate within the car, along each side, a horizontal flue or pipe, A, extending from one end to the other, and terminating at one end in an upright portion, which extends up in the corner through the roof, and has a cowl or hood, *a*, on its upper end, as shown. The flue or pipe may be extended along at any convenient distance below the bottom of the windows and above the level of the floor, but best upon the floor, or eight or ten inches above the same. Into this flue or pipe I make any convenient number of openings, *b*, through which the air from the car may enter the flue and escape.

Instead of simply providing the openings *b* they may be provided with branch pipes *c*, extending outward under the seats of the car and bending downward near the floor, with a mouth opening toward the central aisle, and so located as not to cause a draft too near the feet of the passengers.

In combination with the flue A, I propose to use a hot-air flue, B, leading from a stove in any convenient locality. This hot-air flue I arrange parallel with and in close proximity to the flue A, either above, below, or beside the same. The hot air conducted by it may be admitted to the car through openings *d* between the seats, or it may be admitted into an inverted trough, *e*, secured under the ventilating-pipes *c* below the car-seats.

Instead of placing the pipe or flue A inside of the car it may be formed in the hollow side walls of the car, as shown in Fig. 3. The

flue thus formed will, of course, be provided with the upright end portion, the outlets, and the branches in the same manner as when placed inside of the car. The hot-air flue will also be arranged in the same manner as when the ventilating-flue is placed within the car.

By the above method of ventilation I am enabled to remove the lower strata of air, and to keep the car thoroughly ventilated; and by combining my ventilating apparatus with the heating-flue, in the manner shown, I am enabled to heat the car with great uniformity, and at the same time to assist in the ventilation.

I am aware that a patent was granted to H. J. Ruttan, January 9, 1866, in which a horizontal flue is carried under the floor, and the air exhausted into said flue through a single opening in the floor at the center of the car. The operation of Ruttan's arrangement is, however, materially different from the operation of my own. I therefore disclaim the arrangement shown by Ruttan.

Having thus described my invention, what I claim is—

1. The exhaust-flue A extending horizontally along the side of the car, above the floor, and provided with an upright portion extending through the roof, when provided with the series of openings opposite or between the seats, as shown and described.

2. In combination with the horizontal exhaust-flue A, arranged as shown and described, the lateral branches *c* extending lengthwise against the under side of the seats, and opening into the central aisle near the floor, as shown and described.

3. The combination of the exhaust-flue A and the hot-air flue B, when arranged parallel with each other along the side of the car, above the floor, and provided with the series of openings, as and for the purposes set forth.

4. The combination of the exhaust-flues *c* extending lengthwise under the car-seats with the inverted troughs *d* secured to their under sides or immediately below them, to receive the incoming heated air.

J. G. ALLEN.

Witnesses:

H. TUNISON,
H. TUNISON, Jr.