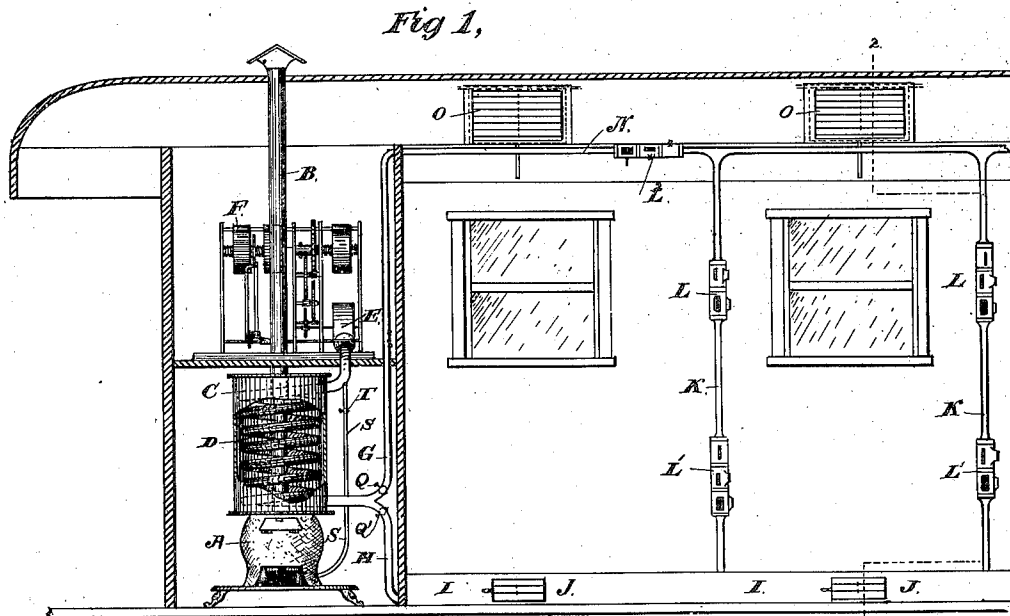
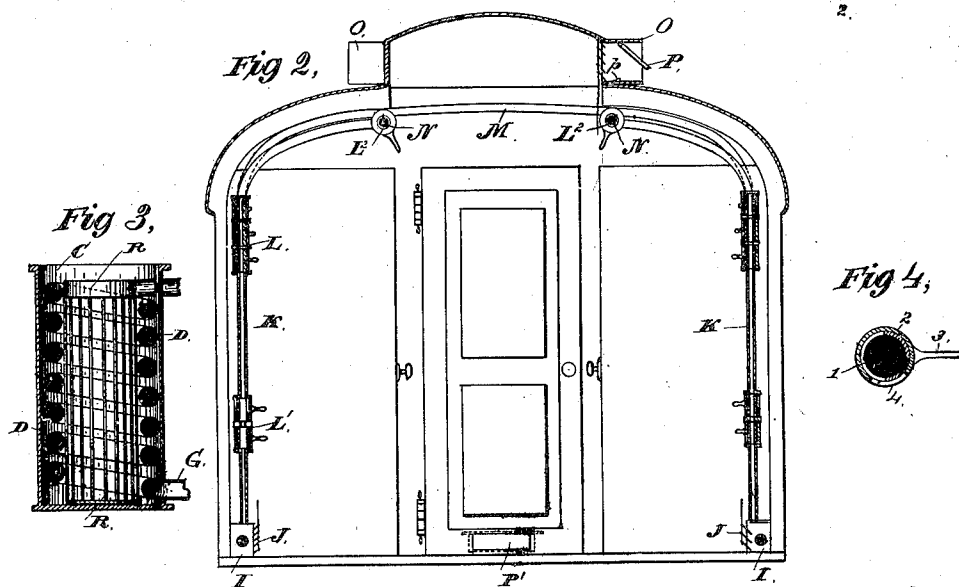


N. N. HORTON.
 Heater, Cooler, and Ventilator for Railway-Cars.
 No. 227,977. Patented May 25, 1880.



Attest;
 Geo. P. Smallwood Jr.
 Walter Allen

Inventor
 N. N. Horton
 By *Knights*
 attys.

UNITED STATES PATENT OFFICE.

NUMON N. HORTON, OF KANSAS CITY, MISSOURI.

HEATER, COOLER, AND VENTILATOR FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 227,977, dated May 25, 1880.

Application filed October 23, 1879.

To all whom it may concern:

Be it known that I, NUMON N. HORTON, of Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Heaters, Coolers, and Ventilators for Railway-Cars, of which the following is a specification.

In carrying out my invention, I provide a tank or reservoir to contain water, which, for winter use, is heated by a stove or by steam-coils, and in summer is cooled by means of ice. Fresh air for the supply of the car is forced by a fan or blower through pipes which pass through the said reservoir in a coil of any necessary length, to cause the air to be heated or cooled, as the case may be, to the necessary extent, by the contact of the hot or cold water with the said coil. In winter the heated air is introduced into the car near the floor. In summer the cooled air is introduced at the upper part of the car.

My invention further relates to a new and improved construction of exit-valves for controlling the direction of the currents of hot or cold air, so as to distribute the said currents, or to locate them, as may be agreeable to the several occupants of the car.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a portion of a car-body with my invention applied. Fig. 2 is a transverse section of the same on the line 2 2, Fig. 1. Fig. 3 is a vertical section of the water-tank, showing the crate applied within the coil of air-pipe to contain ice and protect the said pipe from injury therefrom. Fig. 4 is a transverse section of one of the exit-valves on a larger scale.

A represents a heating-stove, the smoke-pipe B of which preferably passes up through the interior of the water-tank C, which surmounts the said stove and contains a coil, D, through which air is forced by a fan, E, driven by any suitable motor. For this purpose I prefer to use the spring-motor shown at F, which I have made the subject of a separate application for Letters Patent.

The coil D is made of very thin metal, preferably copper, so as to transmit the heat from the water to the air with the greatest freedom, and for summer use I employ a crate, R, Fig. 3, to contain ice and protect the thin-metal pipe from injury.

The contact of the hot water of the tank with the exterior of the air-pipe imparts heat to the air very rapidly and effectively, but without the possibility of overheating. The air is conducted from the tank by a pipe, G, connecting with the coil D, and by a downward branch, H, to a pipe or box, I, which extends along the floor of the car against the wall, and is made very narrow in a horizontal direction to avoid taking up much floor-room.

J J are registers for regulating the admission of heated air to the interior of the car near the floor. In a sleeping-car I employ vertical pipes K K, rising from the horizontal pipe I, for supplying fresh warm air to the lower and upper berths through valves L L'.

The air is carried from one side of the car to the other by means of a bridge-pipe, M, above the doorway, so as to avoid obstructing the passage. The pipe M communicates with a second hot-air box, I, on the other side of the car, having similar vertical pipes K and valves L L'.

The same arrangement of blower and supply-pipes and valves is used for supplying cold air in summer; but as it is desirable to introduce cool air in summer near the top of the car, instead of near the floor, as in the case of hot air in winter, I employ one or more horizontal pipes, N N, communicating with the pipes G and M, and running from end to end of the car directly underneath the dome or roof, and provided at any desirable intervals with valves L².

In order to cause a more free and continuous circulation of air, I connect the vertical pipes G and horizontal pipes N N, as shown in Fig. 1. This combined system of pipes forms an excellent arrangement for supplying fresh air to the interior of the car at all seasons, as well during moderate weather, when the air does not need to be either heated or cooled artificially, as in cold weather, when the air is heated, or in extremely hot weather, when it may be advantageously cooled with ice.

For cooling the air in very hot weather the tank C is filled with ice-water, the contact of which with the exterior of the pipe D reduces the temperature of the air as low as desirable.

The air is purified and dust effectually excluded by two or more screens of wire-gauze of successive fineness, one or more sheets of

bunting, and, if needful, a sheet of closer cloth inside of this, all applied to the open exterior window of the apartment in which the blower is placed.

5 As a further protection against dust, I keep the cloth saturated with water, or, if preferred, I propose to employ any suitable and customary device for passing the air through water.

A full supply of fresh air being thus intro-
10 duced into the car, the air will be constantly changed, and vitiated air removed through ventilators O O, guarded on the outside by shutters P P, made of light wood and so hung as to open freely to pass foul air out, but to close in-
15 stantaneously against felt seats p on the slightest current or pressure from without, so as to prevent the ingress of smoke or dust or external air, which in winter will be colder and in summer warmer, and at all times less pure than
20 that supplied through my mechanical ventilator. Similar shutters are provided, as shown at P' in Fig. 2, in the lower parts of the car-doors, if desired, to take the vitiated air out near the floor, and thus economize heat in cold
25 weather.

In order to prevent an excessive flow of hot air to the upper pipes at the expense of the boxes I I near the floor, where the heat is most
30 advantageously applied, I use a valve or damper, Q, in the ascending pipe G, and in like manner, to prevent the excessive downward flow of cold air in summer, I propose to apply a similar valve or damper, Q', in the descending pipe H; but this is not so necessary.

35 S represents a blast-pipe leading from the fan-case to the lower part of the stove, and controlled by a valve, T, for the purpose of urging the fire when needful.

The mode of constructing the air-discharging valves L L L is best shown in Fig. 4, where
40 1 represents a part of the pipe to which the valve is applied, and 2 a sleeve surrounding

it and turned by a handle, 3. The interior pipe, 1, has a wide slot nearly as long as the sleeve 2, and extending around one-third or
45 one-half the circumference of the pipe. The sleeve 2 is formed with a slot, 4, adapted to register with the slot in the inner tube, but very much narrower. The sleeve is thus
50 adapted to completely close the opening in the pipe or to expose an orifice of any size on either side of the pipe. Jets or currents of air are thus produced in any desired direction, and by using a number of sleeves together, as il-
55 lustrated in Fig. 1, I am enabled to discharge a number of currents in different directions from one center, so as to cool or heat and ventilate every part of the car and suit the re-
quirements of the various occupants.

Having thus described my invention, what
60 I claim as new therein, and desire to secure by Letters Patent, is—

1. The combination of the blower E, tank C, air-pipes D G H I, and valves L, substantially
65 as and for the purposes set forth.

2. The combination, with a main pipe and pipes G H I K, of valves L, each consisting of
70 an internal pipe, 1, slotted or cut away around about one-third (more or less) of its circumference, and a rotating sleeve, 2, having a narrower slot for the purpose of discharging a jet
of air in various directions radial to said pipe.

3. The combination of the blower F B, the pipes D G H I, the outlets O, and shutters P,
75 substantially as and for the purpose set forth.

4. The combination of the stove A, heating-tank C, air-coil D, blower E, and the blast-pipe S, for urging the fire, substantially as and
for the purposes set forth.

N. N. HORTON, M. D.

Witnesses:

OCTAVIUS KNIGHT,
HARRY E. KNIGHT.