J. OLIPHANT.

Car Heater and Ventilator

No. 163,397. Patented May 18, 1875.

Fig. 1

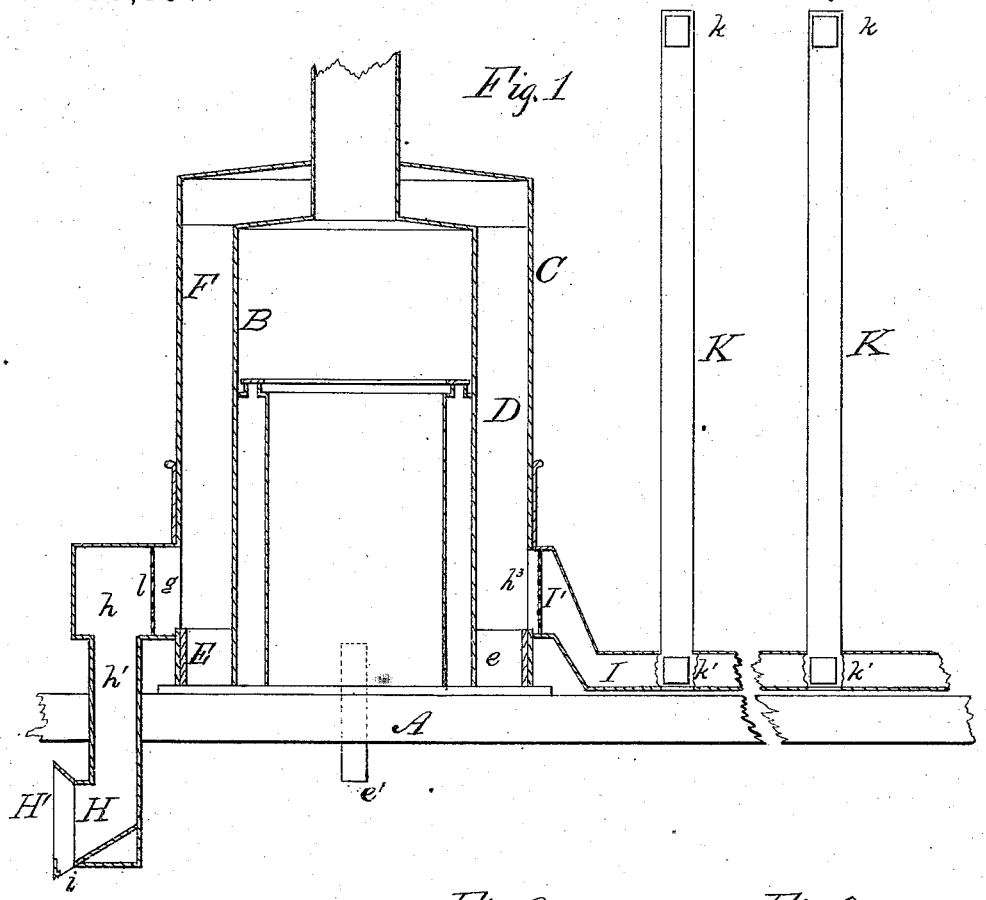


Fig. 2

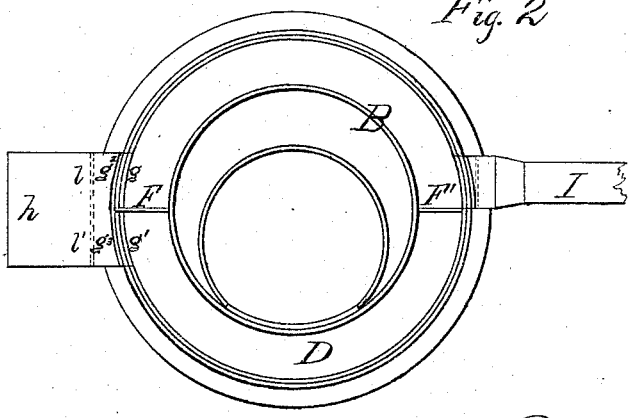
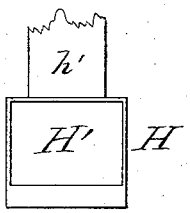


Fig. 3



Witnesses

J. B. Connolly

A. C. Cassell

By John Oliphant Inventor

Connolly Bros

Attorneys

UNITED STATES PATENT OFFICE.

JOHN OLIPHANT, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN CAR HEATERS AND VENTILATORS.

Specification forming part of Letters Patent No. **163,397**, dated May 18, 1875; application filed September 26, 1874.

To all whom it may concern:

Be it known that I, JOHN OLIPHANT, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Ventilation and Heating of Railroad-Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a vertical section of heater and ventilator. Fig. 2 is a plan view of same. Fig. 3 is a front elevation of blower.

This invention has relation to car heaters and ventilators; and it consists in the novel construction and combination of parts, having reference chiefly to, first, the employment, in connection with an apparatus for ventilating and heating cars, of a jacket inclosing an air-space around the heater, and provided with deflectors, openings, and slides, whereby the temperature of the air passing through the apparatus may be regulated; secondly, the provision of a flange encircling the base of the heater, to form, with the wall of the latter, an open-top water-trough at the bottom of the air-space formed by the jacket, for the purpose hydrating the air as it passes through the latter; thirdly, the combination, with the car-heater, of a "blower," located outside the car, and constructed with a sloping bottom, having an opening for the escape of dust and cinders, and provided with a rising flange, to create a suction at the said opening; fourthly, the arrangement, in a heating and ventilating apparatus, of vertical flues, rising, at every seat or pair of seats, from a horizontal floor-flue, and provided with top and bottom registers, all as hereinafter more specifically described and claimed.

Referring to the accompanying drawings, A designates the body of a railroad passenger-coach, and B a heater located in any appropriate position. C designates a cylindrical jacket incasing the heater, but separated therefrom by an annular air-space, D. E designates a vertical flange attached to the base of the heater, and inclosing or forming a trough, *e*, which is adapted to contain water for arresting and receiving the dust and cinders admitted through the blower, and circulating with the air through the air-space. This trough serves also as a receiver of the waste or leakage escaping from the water-receptacle of the heater, when the latter is of the character described in my patent of November 8, 1870, No. 109,143—that is, provided with means for containing water to be automatically admitted to the fire in the event of the overturning the heater or car. The jacket C is located outside the flange E, by preference, but may, if desired, be arranged inside the latter. e' represents a tube, which rises through the water, and having its upper end just above the water-level, and designed to pass off superfluous water from the trough, and prevent any overflow. F F′ indicate vertical partitions on planes intersecting the center of the heater, and arranged, preferably, on opposite sides of the air-space D, or otherwise, according to the requirements of the case. These partitions extend from the bottom of the heater up to a line on a level with its top, and intercept the circulation of air, so as to force it to pass over the entire surface of the heater, or only a part, as may be necessary for the proper degree of temperature and ventilation. These are fastened only to jacket C, that they may be shifted readily. At g g^1 in the side of the jacket C are openings, communicating, respectively, with the two sections of the air-space D, and provided with slide-valves g^2 g^3, to regulate and control the admission of air, and wire-gauze screens l l', arranged between said slide-valves and the air-chamber, for the further cleansing of the admitted air. The openings g g^1 communicate, also, with the air-chamber h, located outside of and against the exterior surface of the jacket C, and connected, by means of a capacious tube, h^1, with the blower or receiver H, arranged either above or below the car. The mouth of said blower is intended to face in the direction in which the car is moving, and is of a rectangular funnel shape, to increase the receiving capacity.

A wire screen, H′, guards the upper and greater portion of the mouth, and, to a great extent, prevents the entrance of dust and cinders. As some, however, of the finer par-

ticles will pass through the said screen, such as fall upon the inclined bottom of the blower will descend in consequence of its inclination, and will be drawn down through the aperture *i* by the suctional tendency of the outside air, to create a vacuum behind the guard-flange on being deflected downwardly by it. At an appropriate place, preferably opposite the openings *g* g^1, another opening, h^3, is formed in the jacket, and communicates with the back sections of the air-space, and, over the heater, with the front section, and with the main ventilating flue or tube I of the car. A sliding wire screen, I′, is fitted to the opening h^3, and also to the openings *g* g^1, respectively, in order to more thoroughly screen and purify the air. K K′ designate branch tubes rising from the main flue I to any desired height on the side of the car; and *k k′*, registers located at the upper and lower ends thereof.

The *modus operandi* of the apparatus is as follows: During summer time fresh air is constantly admitted through the blower and air-chamber, and thence through both sections or passages of space D to the tube, whence it rises through the branches K K′, and escapes from the upper registers, the lower register being closed. During cold weather the admitted air is heated by closing the sliding valve g^2 and opening g^3, causing the air to pass around and over the heated surface of the heater. Cold air is admitted alone by closing the valve g^3 and opening g^2, allowing the air to pass around the back or cooler portion of the heater. By opening both valves to a proper extent the temperature of the air may obviously be regulated to any desired degree. During cold weather the registers *k′* are used chiefly to admit the air, in order to disperse the heat along the lower portion of the car, from where it will ascend, and adequately warm the upper portion.

I am aware that it is not new, broadly, to employ, in combination with a heating and ventilating apparatus for cars, a trough or chamber at the base of the heater to hold water, for the purpose of purifying and hydrating the air to be admitted to the car. My improvement, in respect to the water-trough, lies in its arrangement with relation to the air-chamber surrounding the heater. It will be observed that I locate the trough on a line with, instead of below, the heater, and make it a part of the air-space D, with the annular form of which said trough coincides. Without such or an equivalent arrangement of the trough, it is obvious that the proper deflection of the air-currents could not be effected by the partitions F F′ and slides g^2 g^3, as otherwise the air admitted would, notwithstanding the adjustment of the slides, be allowed to pass under the bottom of the heater, and avoid the partitions. My improvement further differs from other devices of the same class in being merely a rising flange, open at the top, and, therefore, useful in the event of accident overturning the heater, to admit water to the fire. I also am aware that the employment, in combination with a car heating and ventilating apparatus, of flues to convey the air to the body of the car, both above and below the heads of the passengers, is not broadly new; but the feature which I consider novel in my invention is the employment and arrangement, as described and shown, of a series of vertical flues, located at intervals along the interior of the car, and communicating with a floor-flue, which is used to conduct the air, of whatever temperature, from the air-chamber encircling the heater. Besides the obvious advantage obtained in the employment of flues which will radiate heat at all heights in the car, it is apparent that the circulation is improved, the temperature of the air from a single main conduit being more uniform than where it is conducted through two or more at different heights.

Having fully described my invention, I claim—

1. The combination of the jacket C, inclosing the annular air-space D, partitions F F′, openings *g* g^1, and slides g^2 g^3, substantially as and for the purpose specified.

2. The flange E, encircling the base of the heater B, and forming, with the wall of the latter, an annular open-top trough, in combination with the jacket C and air-space D, conducting air to the interior of the car, substantially as described.

3. In combination with the car-heater, the blower H, constructed with a sloping bottom and bottom opening, and provided with a vertical flange at its lower edge, as and for the purpose specified.

4. In combination with an apparatus for heating and ventilating cars, a series of vertical flues, rising at every seat or pair of seats from a floor-flue, and provided with registers at top and bottom, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of September, 1874.

JOHN OLIPHANT.

Witnesses:
J. E. FLANEGIN,
GILBERT M. MCMASTER.