

(No Model.)

J. L. HADDEN.

APPARATUS FOR HEATING AND VENTILATING CARS.

No. 246,610.

Patented Sept. 6, 1881.

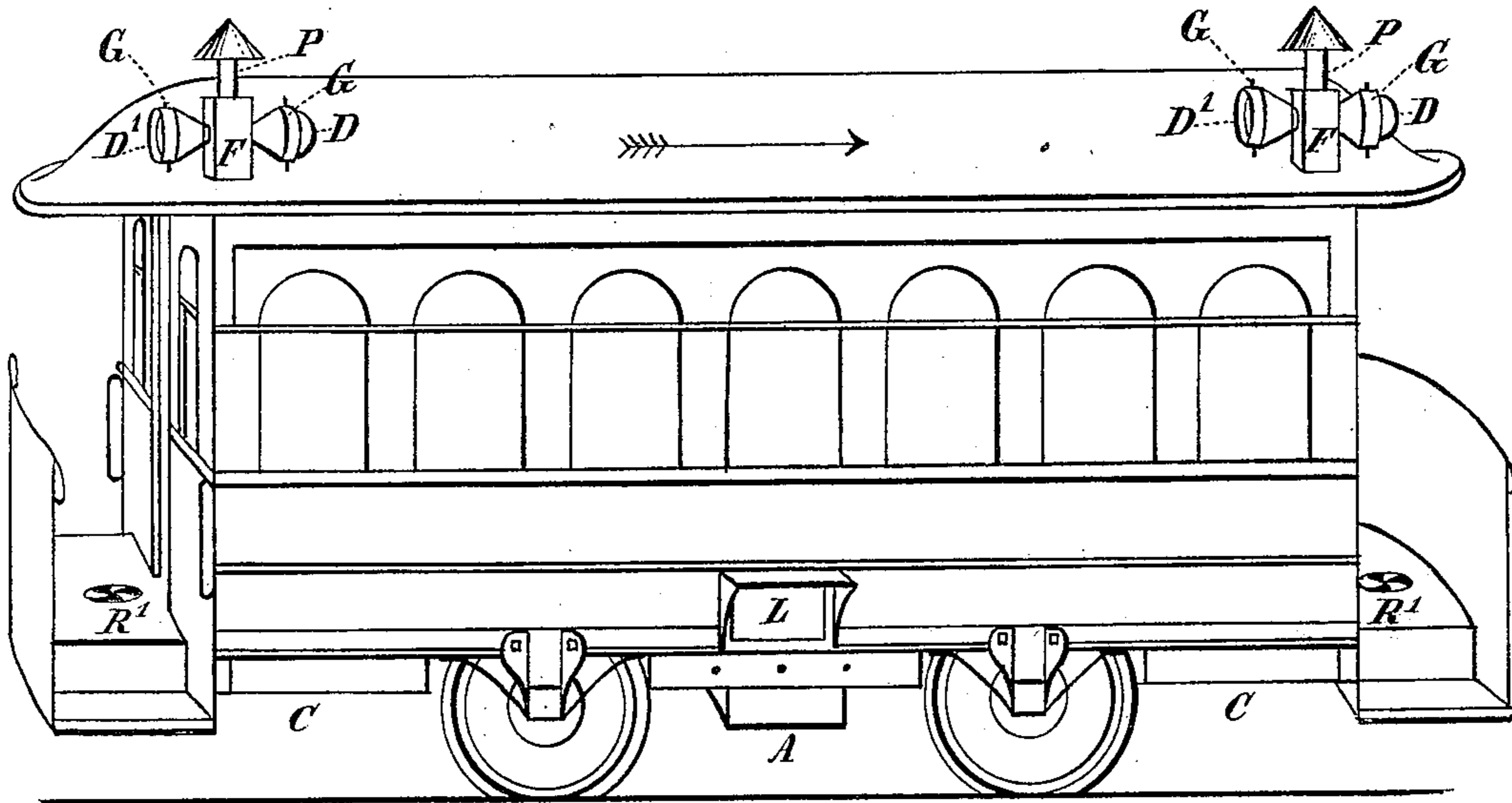


Fig. 1.

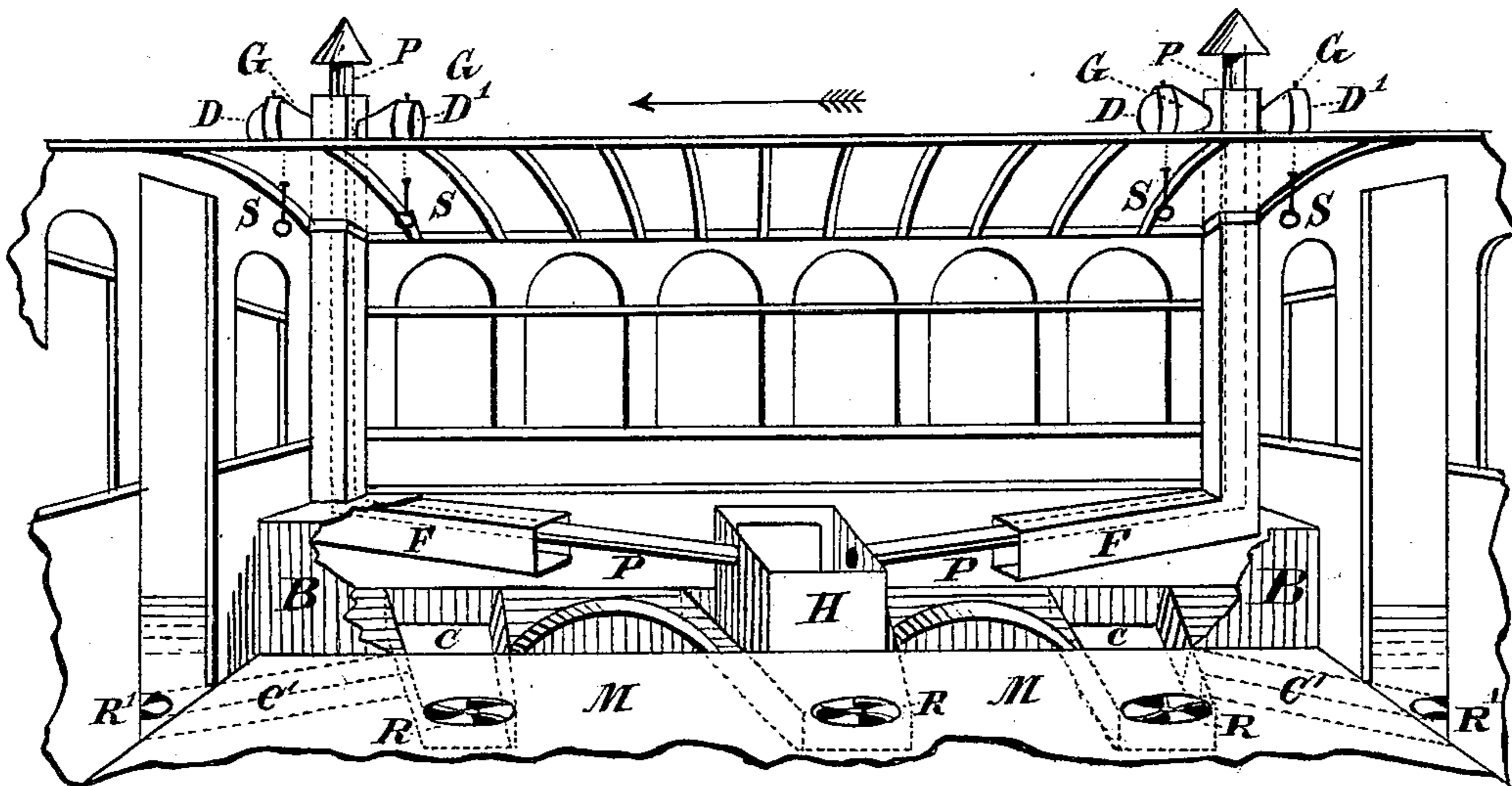


Fig. 2.

WITNESSES:

James M. Phillips,  
John Burkhardt

INVENTOR:

John L. Hadden,  
per his Attorney in fact,  
Joshua Sasey.

# UNITED STATES PATENT OFFICE.

JOHN L. HADDEN, OF PHILADELPHIA, PENNSYLVANIA.

## APPARATUS FOR HEATING AND VENTILATING CARS.

SPECIFICATION forming part of Letters Patent No. 246,610, dated September 6, 1881.

Application filed May 17, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN L. HADDEN, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Heating Cars, of which the following is a specification.

My invention relates to an improved device for securing a continuous supply of heated fresh air within passenger-cars, more especially street horse-cars. Its construction and operation will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 represents an exterior view of one side of an ordinary horse-car to which my invention is applied; and Fig. 2, a perspective view of the same from the interior, with the larger portion of the top and side of the hot-air chamber cut away in order to show the arrangement of devices within said chamber.

I utilize the space beneath the usual longitudinal seat of the car for the location of my hot-air box or chamber B, which I prefer to make of galvanized sheet-iron. This chamber communicates with the open air by means of flues F F at each extremity thereof. The end of each flue, protruding above the top of the car, connects with an open funnel, G, on each side, extending horizontally and lengthwise of the car, as seen in both figures. These funnels are each provided with adjustable dampers D D'. Where the front of the car remains the same—that is, the car is turned around at the terminus of the road—it is necessary to use but a single funnel to each flue on the front part of the latter.

It is obvious that when the car is in motion—say in the direction of the arrow—the tendency is to force the air entering funnels G (the dampers D being more or less open) down through flues F into the chamber B, and thence into the car through openings leading thereto from said chamber. Such openings or conduits C (shown partially by dotted lines) are provided, as seen in Fig. 2. These communicate with the interior of the car by registers R in the floor, also with the platforms by conduits C' (dotted lines) opening out into registers R'. In order to heat the volume of air thus forced into chamber B, I secure a suitable

stove or heater within the latter, the ash-box A, Fig. 1, extending a short distance below the bottom of the car. The door L of the heater opens out from the side of the car, Fig. 1, an aperture being cut through the latter for that purpose. The heater is so constructed as to cause as rapid heating of the air within the box as is possible.

It is not necessary to describe the particular style of heating apparatus, as any skilled person can readily construct one more or less adapted for the purpose. I purpose, however, making the same of sheet-iron and lining the top, front, and back with soapstone or similar material, the sides thus heating the air quickly, and the top, front, and back retaining heat.

The smoke and gases of combustion pass out through pipes P, connected with the heater and extending up through the flues F, out the closed tops of the latter, as seen in the drawings, at the same time the hot smoke and gas imparting some heat to the air descending the flues. Also, by this arrangement the adjacent wood-work is prevented from becoming overheated and the passengers at the corners cannot come into contact with the hot pipes.

In order to prevent excessive heating of the wood-work near the hot-air box, I surround the latter with suitable air-space, properly ventilated, if necessary, by communication with the external air. This, however, is not shown in the drawings.

The conduits C, which conduct the heated air to the registers, are, in order to economize space, secured beneath the car.

Where the fronts of the car are alternated, as is usually the case—that is, where the car is not turned about at the terminus—it is necessary to provide funnels and dampers at the front and the rear of flues F, as shown. When the car is moving, say, in the direction of the arrow, the dampers D' should be closed and D open. Where the front of the car is unchanged, only one funnel on the front of each flue is requisite.

The dampers may be regulated from the inside of the car by means of the connecting-rods and handles S. The platform-registers R' may also be employed to regulate the flow of heated air into the car, as it is evident that

a greater quantity of air is thrown into the interior of the car accordingly as these registers are more or less open.

It will be observed by Fig. 2 that the ends 5 of the flues F within the chamber B are projected toward the stove H, whereby the cold air descending the flues will come into immediate contact with the sides of the stove, and thus be more quickly heated.

10 It is not ordinarily intended to apply my said invention to more than one side of a car. I claim—

1. An apparatus for heating and ventilating cars constructed of the following devices: an 15 air-chamber located beneath the seat of the car, flues connecting such chamber with the air outside the car and extending within the chamber to a point near the heater, funnels and dampers or equivalent devices for securing and 20 regulating the flow of air into said flues when the car is in motion, a heater located wholly or partially within said air-chamber, and smoke-pipes extending from the heater up through the flues into the open air, together with conduits 25 leading from the air-chamber into the interior

of the car, all combined, arranged, and operating substantially as and for the purpose shown and described.

2. In combination with a car, the heater H, air-chamber B, conduits C, flues F, provided 30 with funnels G, and dampers D D', or equivalent devices for directing and regulating the flow of air into the flues, substantially as shown and set forth.

3. The flues F, provided with a funnel, G, 35 both at the front and the rear thereof, and dampers D D', whereby the flow of the air into the flues may be secured and regulated as the car is moving in either direction, substantially as shown and described. 40

4. In combination with the cold-air flues F, stove H, air-chamber B, and conduits C', communicating therewith, the registers R', communicating with chamber B and opening on the platform of the car, as and for the pur- 45 poses described.

JOHN L. HADDEN.

Witnesses:

H. V. BUCKLEY,  
WM. H. CARSON.