

# Smith & Wagner Car Ventilator.

N<sup>o</sup> 36,536.

Patented Sep. 23, 1862.  
Fig: 1

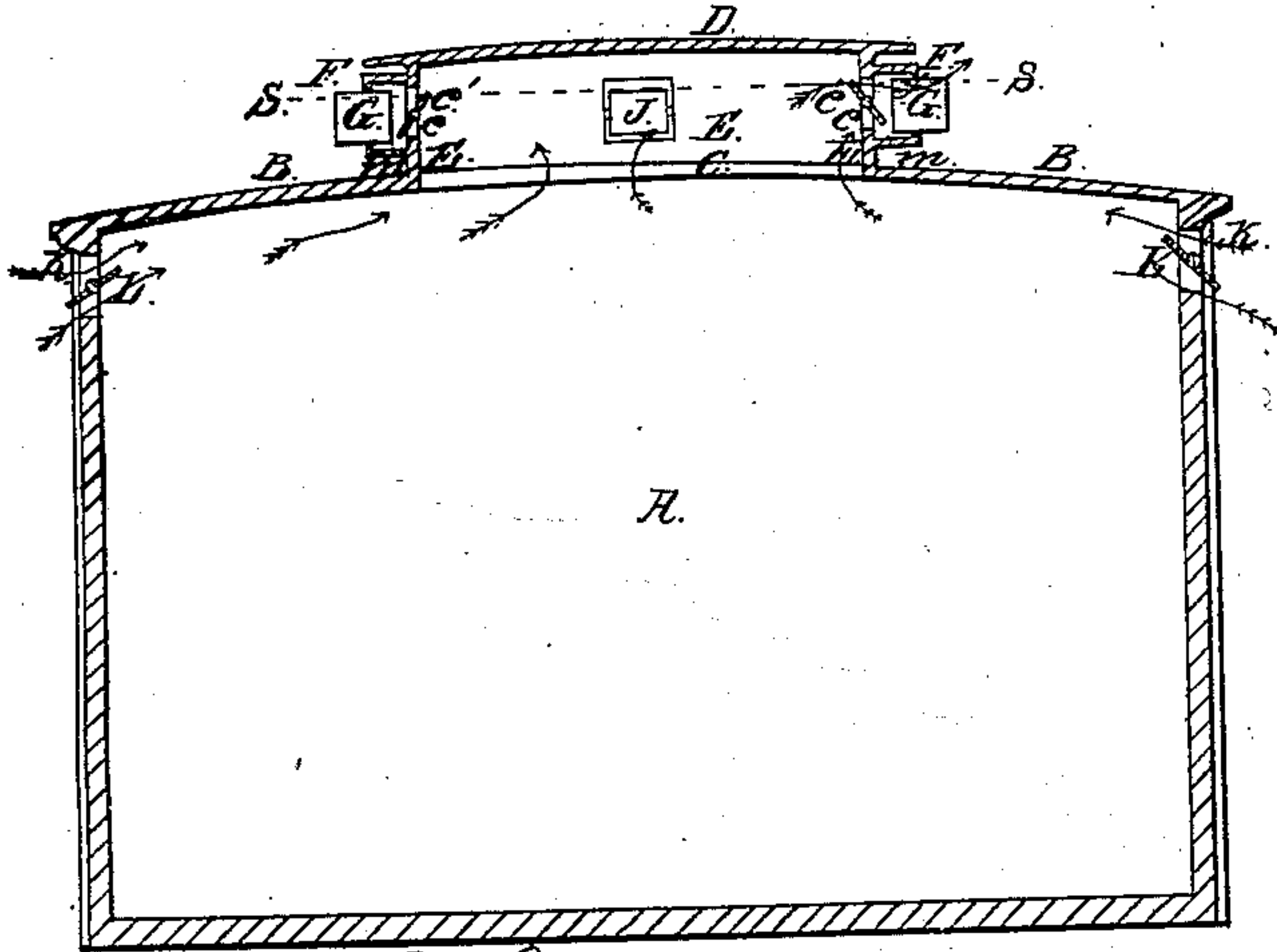
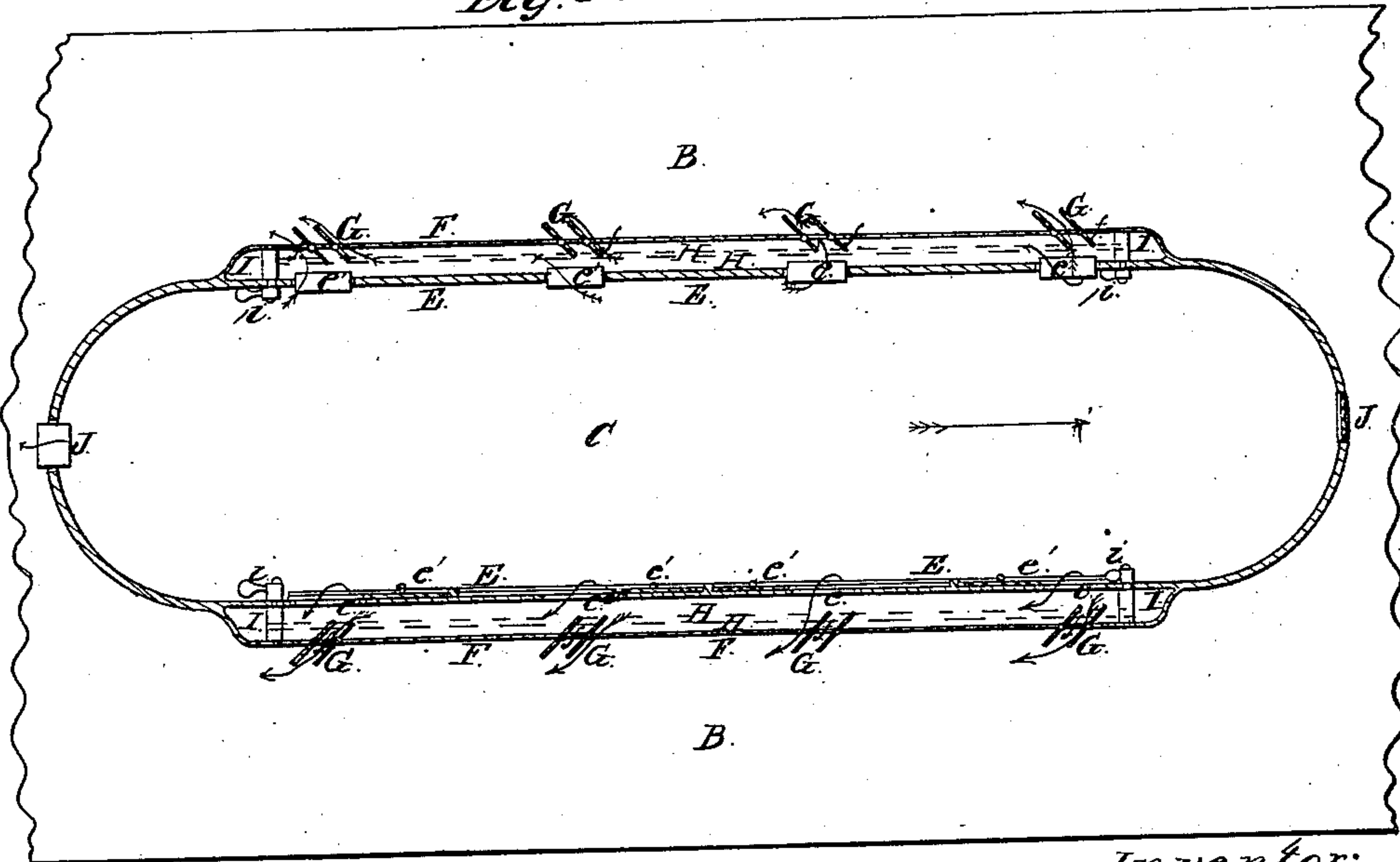


Fig: 2.



Witnesses:

*H. N. Babcock*

*D. W. Fulton*

Inventor:

*Alva Smith*

*Webster Wagner*



# UNITED STATES PATENT OFFICE

ALBA F. SMITH, OF NORWICH, CONNECTICUT, AND WEBSTER WAGNER, OF PALATINE BRIDGE, NEW YORK.

## VENTILATING RAILROAD-CARS.

Specification of Letters Patent No. 36,536, dated September 23, 1862.

*To all whom it may concern:*

Be it known that we, ALBA F. SMITH, of Norwich, in the county of New London and State of Connecticut, and WEBSTER WAGNER, of Palatine Bridge, in the county of Montgomery and State of New York, have invented certain Improvements in Ventilating Railroad-Cars; and we do hereby declare that the followig is a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, and in which—

Figure 1 is a cross section of the body of a car with our improvements attached, and Fig. 2 is a horizontal section on the line S, S, in Fig. 1.

The nature of our invention consists in discharging the air through the entire space between the cross frames under an elevated portion of the car-roof, which extends longitudinally along the chief portion of the length of the car, and exhausting it from thence by deflectors through openings uniformly distributed in the sides of such elevated portions whereby the motion of the car is made to effectually and equably withdraw the foul air which gathers in the upper portion of the car, without producing an unpleasant draft of air at any portion thereof.

The nature of our invention also consists in the employment of such exhausters in the sides of a central elevated portion of the roof in combination with a series of separately adjustable apertures near the top of the sides of the car, so that the ingress and egress of the air is distributed through the whole length of the car, and each passenger may by opening or closing the aperture nearest him graduate the ventilation at that part to suit his convenience without affecting the ventilation of other portions, and so that by reason of the ventilation being all above the heads of the passengers no disagreeable draft is created even when the ventilation is most thorough.

To enable others skilled in the art to make and use our invention we will proceed to describe its construction and operation by the aid of the drawings.

A is the body of a car constructed in any of the approved styles of either wood or metal. In the roof B we provide an opening C, running nearly the whole length of the car and of any suitable width, say about

one third the width of the car, but allowing the rafters to extend across the aperture as represented for strength. Over this opening we construct a second roof D elevated above the roof B of the car with sides E, pierced with any desired number of openings *e*. The openings may be provided with shutters *e'*, either tilting or sliding, as shown in the drawing, so that one or more of the said openings *e* may be inclosed at will. Exterior to E and covering the perforations therein we build continuous chambers F, extending along the sides, having openings, *f*, corresponding to those in E, as represented in Fig. 2. In each of these openings, *f*, we fix one or more shutters or exhausters G, swinging on vertical shafts and capable of being adjustable at various angles to the line of motion of the car, and also of being reversed so as to stand in the same relative position, with the car going in either direction. All the shutters or exhausters G, on either side of C, are connected together by a cord, wire or other suitable tensile connection H, which passes over a cylinder I at either end of F, so as to form an endless band as represented. Handles, *i*, serve to turn I, and thus to operate all the exhausters on that side at once adjusting them all to the same angle or reversing them all by one single movement of the handle *i*. The chambers F are raised a little above the roof of the car so as to leave channels or passages *m, m*, for the free passage of cinders or other particles to allow them to be blown along without being liable to be blown in through the openings, *f*, when the current is by any means temporarily reversed. This is a matter of some importance when a car is standing at a station with a whiffing or variable wind, and is of still more consequence when a car chanches to run for a little period with the exhausters in the wrong or reversed position. At each end of the opening C, we place a single shutter J, swinging on a horizontal axis. The forward one of these exhausters must always be closed and this being attended to, and the rear one being opened, these openings promote the efficient action of the exhaust when the car is in motion. All of these shutters or exhausters may be made to adjust themselves by the action of the air if desired. To enable the series G at each side to so adjust themselves, the simple giving to one of the



outer arms or wings a considerable length so as to be acted on very powerfully by the inertia of the air might be sufficient. We prefer however for simplicity and certainty  
5 the hand operation described.

When the exhausters G are adjusted in the position shown in Fig. 2, and the motion of the car is in the direction of the black arrow, the action of the air upon the  
10 shutters G, tends to cause a current of air to flow from the car in the direction of the red arrows, first through the opening *e* into F, and thence through the openings, *f*, into the external atmosphere, and if air is supplied to the car from any source, this current will be maintained while the car is in motion. In order to supply the air for this current so as to make thorough ventilation without inconvenience to the passengers, we provide openings K in the top of the sides of the car, at intervals during its entire length, and provide a shutter L for each opening. These openings are above the heads of the passengers and the  
25 air which comes in thereat, passes transversely along the interior of the top of the car in the direction of the red arrows without descending so as to blow directly upon the passengers, only so much of it descending as is necessary to supply the place of the foul air as it rises. If, however, any passenger experiences inconvenience from the air, he may shut the opening K next him, while those who prefer can have their  
35 ventilation open. The number of openings both for the ingress and egress of the air, and their distribution through the length of the car, insures a very efficient ventilation without necessitating a violent action at any one point. The induction openings K being directly beneath the eaves of the car, receive less dust and smoke than in any other position. This arrangement of openings for the ingress of air, is very efficient  
45 and agreeable in warm weather, but in cold weather it is necessary to warm the air in order to produce an agreeable temperature in the whole car. In such case we employ our improved exhausting devices as above described graduating the amount of their  
50 action to the circumstances, by the use of the shutters G, but we admit the air to the car through what is known as Spear's stove, or some analogous heating device—we prefer to employ one at each end of the car. In this arrangement the air is received from

above, carried down through heating pipes where it is warmed and discharged at the base, just over the floor. The action of the exhausters causes a rapid flow of air  
60 through these heaters and insures not only a good ventilation but a nearly equable warmth through the whole car.

The advantages due to several features of our invention may be separately enumerated  
65 as follows: The advantages due to our arrangement of exhausting devices in the elevated roof, are the very efficient and equable action through the whole length of the car, whether the air is let in through the openings K or through suitable heaters, or otherwise, and the continuity and small cross sectional area of the elevated roof offering but a slight obstruction to the motion of the car through the external air. The advantages due to the combination and peculiar arrangement of our elevated central roof and induction and eduction passages are that a current of air more or less brisk as may be desired by each passenger is induced to flow through the adjacent induction passage, not upon him but across over his head and up into the free space under the elevated roof, the great capacity of the latter space and the freedom of the exit  
85 therefrom preventing any disagreeable downward draft upon the passengers from the meeting of the currents.

Having now fully described our invention what we claim as new therein and desire to secure by Letters Patent, is—  
90

1. Receiving the air from the interior of the car into the space under the longitudinal elevated portion of the roof, and exhausting it from thence by deflectors through  
95 openings uniformly distributed at the sides of such elevated portion for the purposes set forth.

2. The combination and arrangement of the exhausting devices or their equivalent  
100 in the sides of an elevated central portion of the roof and separately adjustable apertures near the top of the sides of the car for the admission of fresh air substantially in the manner and for the purpose herein set forth.  
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ALBA F. SMITH.  
WEBSTER WAGNER.

Witnesses:

G. H. BABCOCK,  
D. W. STETSON.