(No Model.) 4 Sheets—Sheet 1.

R. M. PANCOAST.

VENTILATING RAILWAY CARS.

No. 515,608. Patented Feb. 27, 1894.

FIG. 1.

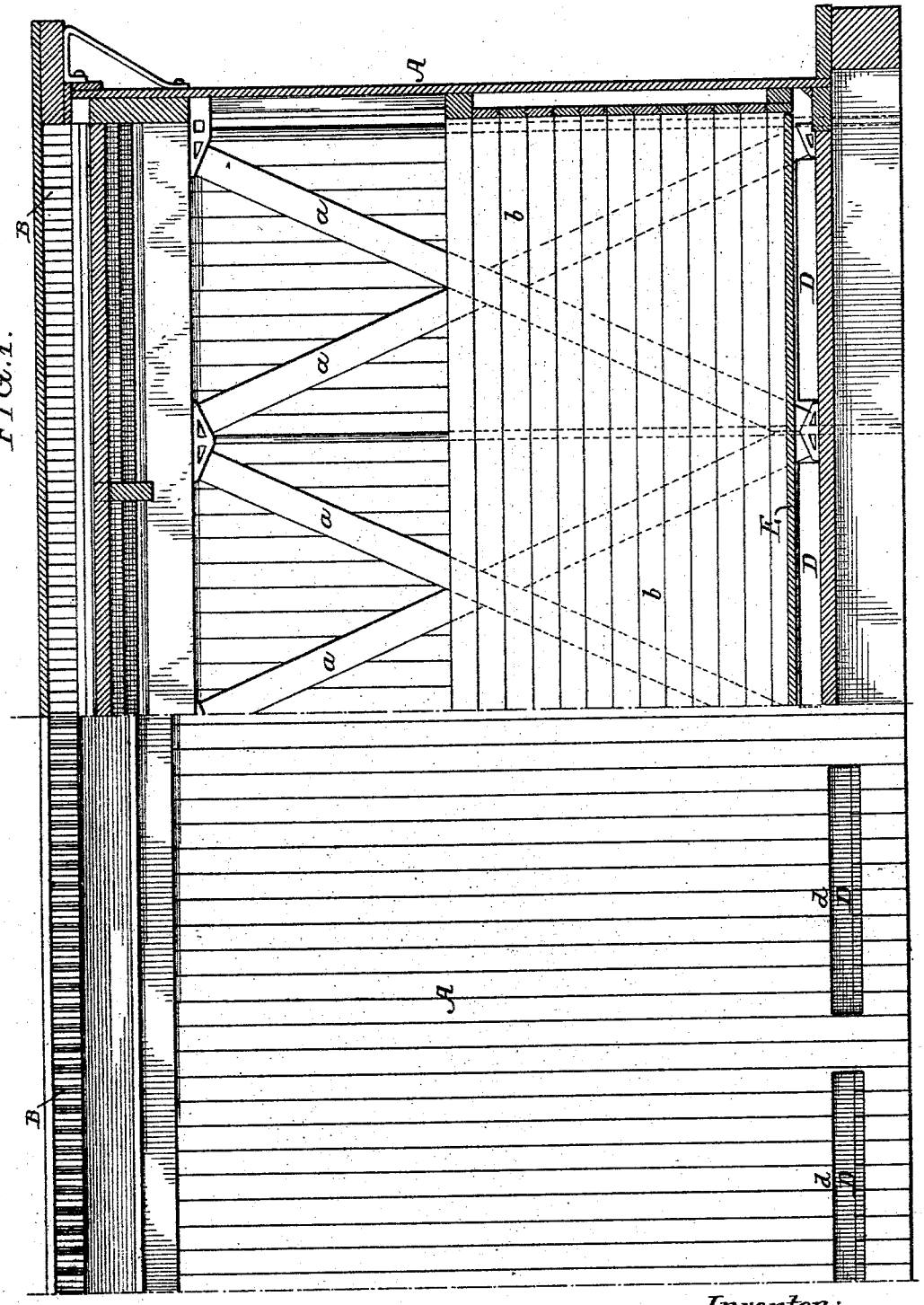

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FIG. 2.

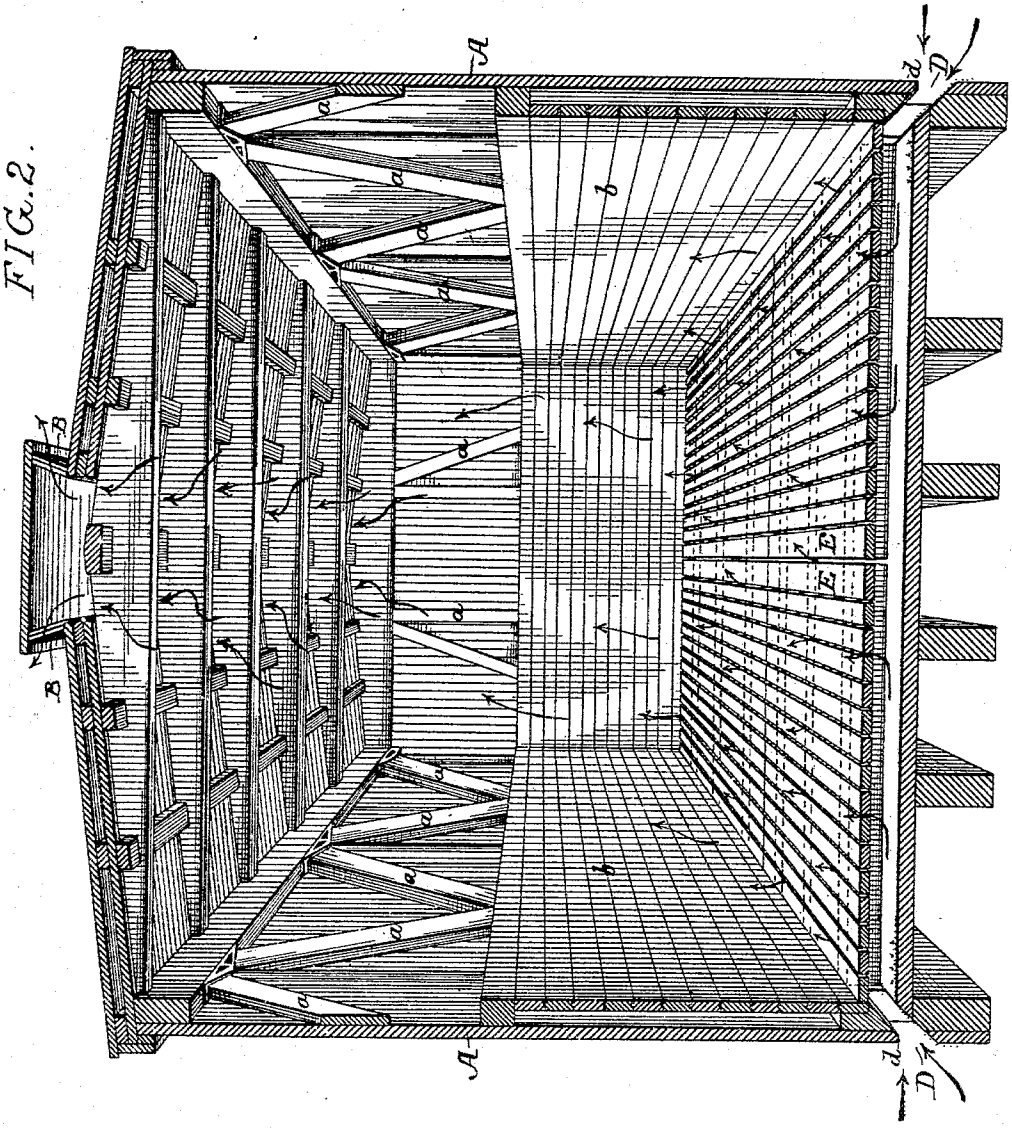

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FIG. 5.

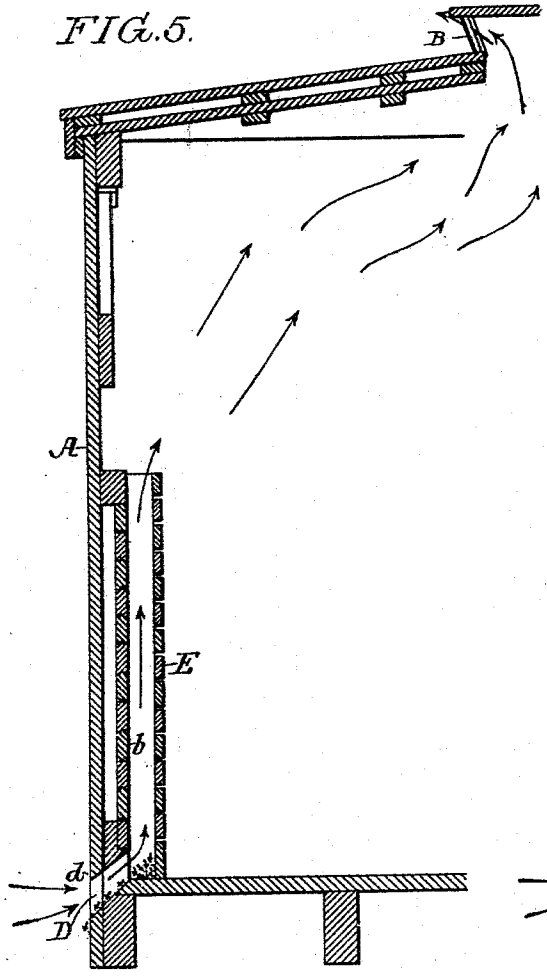

FIG. 4.

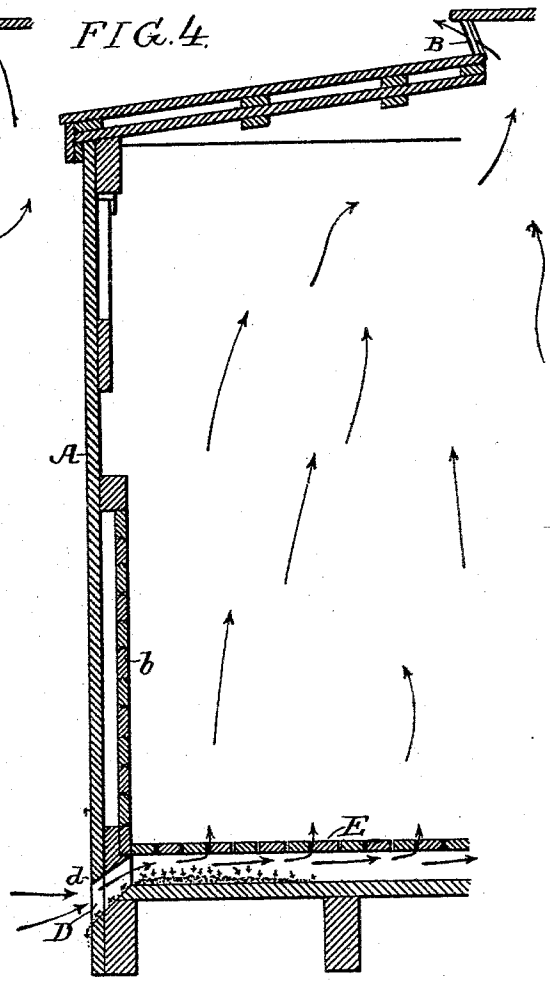

FIG. 3.

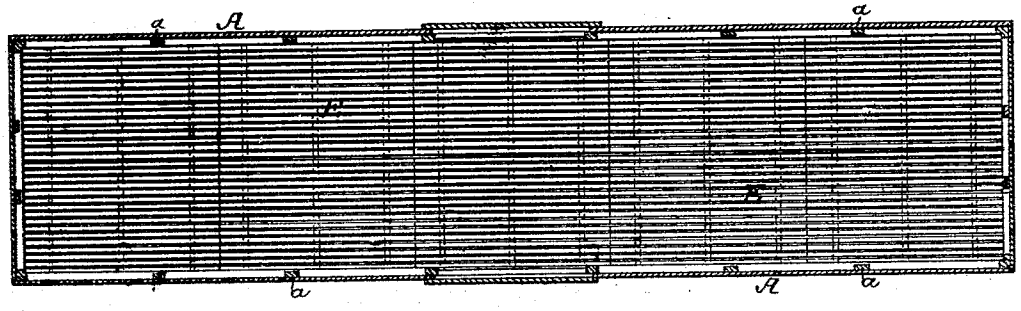

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FIG. 6.

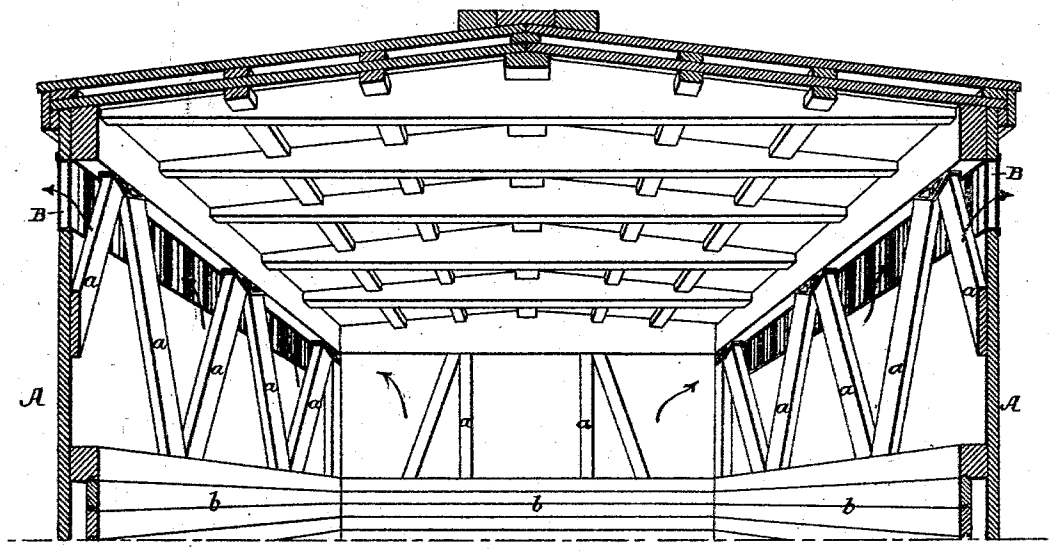
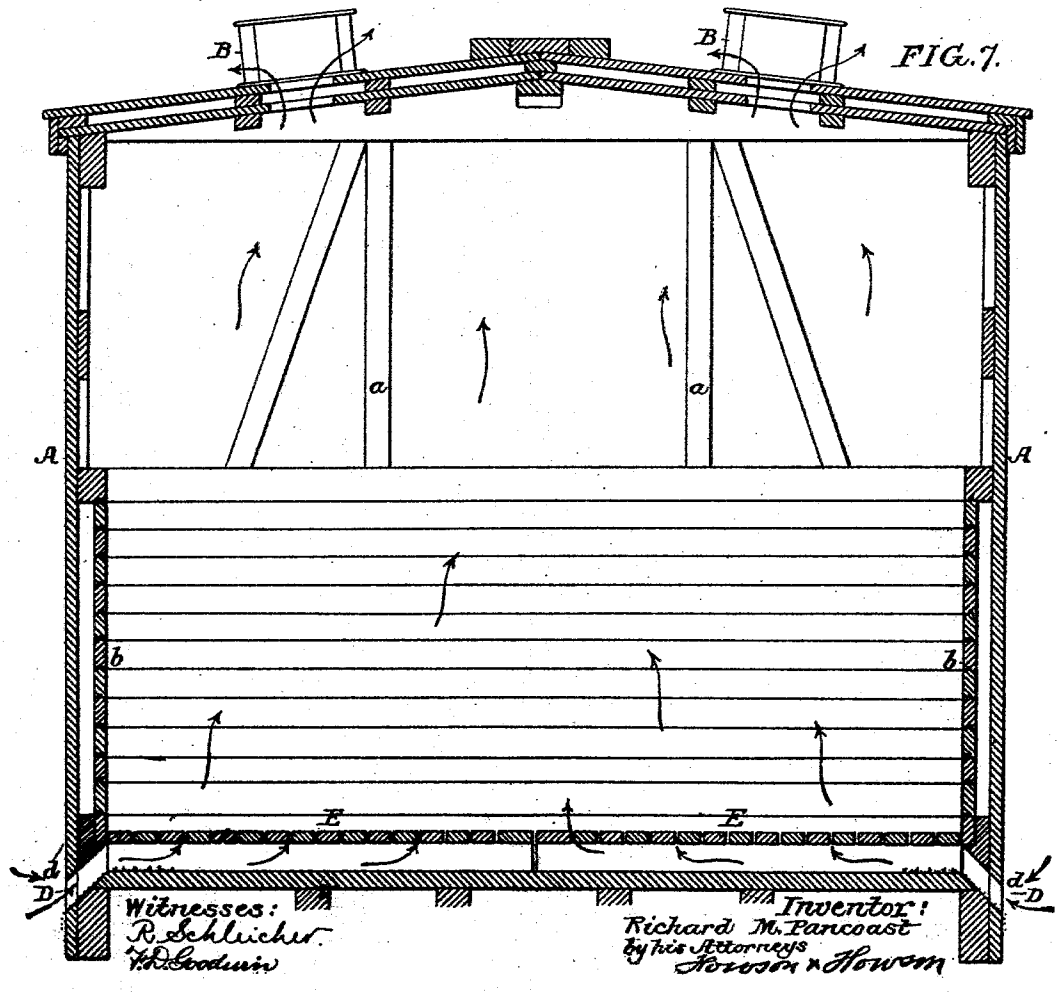


FIG. 7.



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UNITED STATES PATENT OFFICE.

RICHARD M. PANCOAST, OF CAMDEN, NEW JERSEY, ASSIGNOR TO J. D. WILSON AND L. T. PANCOAST, OF PHILADELPHIA, PENNSYLVANIA.

VENTILATING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 515,608, dated February 27, 1894.

Application filed June 2, 1893. Serial No. 476,365. (No model.)

To all whom it may concern:

Be it known that I, RICHARD M. PANCOAST, a citizen of the United States, and a resident of Camden, Camden county, New Jersey, have invented certain Improvements in Ventilating Railway-Cars, of which the following is a specification.

The object of this invention is five fold:—First. The application of a solely vertical, and positive upward permeation of clean air, minutely and particularly through the whole of the load, when advisable and practicable, as with fruits in packages; or upward, directly and uniformly over all the load, through the whole space above the load, as with bulk vegetables, &c. Second. The avoidance of light to the load, and the prevention of theft, by having the fresh air inlet openings all entirely below the load (below the floor that supports the load), and the foul air exhaust openings all entirely above the load. Third. Such an application of such appliances as will practically keep all dirt and rain from the load. Fourth. Such an application of such appliances as can be economically applied to common freight cars without interfering with their construction. Fifth. Such an application of such appliances as can be readily closed at any time, thereby rendering the cars as useful for winter service as they were before.

By testing, I have found that the stagnant air in the center (among the goods), of an ordinary so-called "ventilated fruit car" in the summer, will rise 25° to 35° higher than the outside shade temperature; and, by experiment, I find that if a quantity of berries, or other perishable fruits, &c., be divided into two equal portions, and subjected to the same surrounding conditions, except that, one portion be more or less confined, and the other portion be ventilated; the one will spoil quicker in proportion as it is confined, and the other will be preserved long in proportion to its ventilation. I have failed to find, what I am confident is wanted in the premises, and that is, such an application of ventilation to freight cars as will automatically keep a positive current of fresh air permeating all through or passing over the load, to carry off, as constantly as it is exhaled, the fruit heat, sweat, &c., which if confined hasten decay. I propose to secure this ventilation automatically with the motion of the train or wind by the easiest and cheapest means, with the simplest appliances possible, and without interfering with the usual construction of the cars. I also design to keep out the light and dirt, which are great drawbacks to the present style of so-called "ventilated fruit cars," which latter, at best, only permit a haphazard ventilation of a portion of the space about the load, and admit the injurious light and dirt to the load; and further, I design to prevent theft which is so prevalent (through the common ventilating openings and appliances in the sides and ends of the cars). A vertical direction is not only the natural one for ventilation generally, but, in the case of cars particularly, it is certainly the best, as it is also the shortest distance in the car; and in a freight car the vertical is the only practicable direction to ventilate through the load; and to secure a positive, clean, vertical ventilation through the load in the car, and as well to avoid easy pilfering places, it is essential to preclude lateral ingress, *via* any of the usual haphazard openings in the sides and ends of the car.

Reference being had to the accompanying drawings:—Figure 1, is a side view partly in section, showing sufficient of a freight car to illustrate my invention. Fig. 2, is a transverse sectional perspective view of the same. Fig. 3, is a diagram plan view, showing the horizontal arrangement of the perforated false floor. Figs. 4 and 5, are diagram views illustrating the two ways of using the sections of the false flooring. Fig. 6, is a sectional perspective view of a car showing side exhaust devices at the top of the car body. Fig. 7, is a sectional view of a car showing exhaust cowls on the roof.

A is the body of the car having the usual framings *a*, and inside sheathing *b*.

B are exhausts extending from end to end of the car, as shown in Fig. 1. The exhausts in this instance are mounted directly under the running board on the roof of the car and the exhausts are so made that they are proof against storm and dirt, but will readily allow the free exhaust of air from the car. In fact the exhausts are so made that the current of air on the outside either due to the motion of the car or wind will form sufficient draft to exhaust the air from the car, fresh air being

admitted at the bottom of the car under the load.

I make a practically clean air inlet opening D, the whole available length of the bottom of each side of the car. The ends of the supporting braces *a* and door posts being necessary but short and the only brakes into this latter side inlet space, make of this, otherwise one, a series of openings, (but practically a continuous one) on each side of the car. The openings D, are entirely below the perforated false floor E, and, owing to their narrowness and angular upward direction, they make theft-proof entrances to the load above. They admit air in an obliquely upward direction to a point just over the permanent floor, between the permanent floor and the false floor, on or against which the load rests. The upward course of the entering air largely eliminates all dirt, rain, &c., at the point of ingress, and everything that chances to get blown up this flue D, to the space between the false floor and the true car floor, is deposited on the true car floor in the space indicated by short blunt arrows in Figs. 4 and 5, as a reservoir of subsidence, and jostles out again along the outer bottom edges as the car changes position when in motion.

The raised perforated false floor E, is preferably made in sections as shown in Fig. 3, so that it can be conveniently handled from its flat position on the car floor, Fig. 4, for ventilating through the load, to suitable edgewise position up against the sides of the car, Fig. 5, for ventilating over the load, or be stowed away when not wanted for ventilation.

The inlet openings D are preferably located and constructed so that the lower edge *d* of the outer sheathing of the car will be on a line with or below the upper surface of the true floor of the car, so as to insure an upward direction to the entering air and facilitate the rejection of dirt and water; and also, the lower this opening below the load, the more difficult will be the pilfering from the load, which is a great item in ventilated fruit cars. The entering current of air, bearing upward against the under part of the raised perforated false floor as shown in Fig. 4, disperses itself all through the small interstices and passes on up among and through the load largely by virtue of the strong overhead exhausts. So when shipping fruits, &c., in crates, &c., or such material that needs complete individual aeration, I leave the perforated false floor rest in the horizontal position upon the true car floor, as shown in Figs. 2, 4 and 7, forming an air space between the two floors, and allowing the air to pass through the slatted false floor up uniformly through the load, and exhaust at the roof of the car; thus sweeping up and out all the noxious exhalations, and keeping the contents of the car perfectly sweet and dry; but when such products are to be transported as are impracticable or unnecessary to pass air through, then I stand the false floor racks up edgewise against the sides of the car, as shown in Fig. 5, thus forming vertical side channels between the car sides and the load, for the passage of air up, from the said openings beneath, to the space above the load; and from there the air is exhausted through the exhaust appliances; so that while this load itself is not permeated by an air current, there is however a free air space at each side of the load, and consequently the car is as well ventilated as possible.

Any good exhaust cowls may be used in the top of the car without departing from my invention; but I prefer to use the cowls herein shown, as they have proved by practical tests to be dirt-and-storm proof, and much more powerful exhausts than any now upon the market.

No particular manner of closing the ventilating apertures is shown, as various styles of doors, dampers, &c., may be used at pleasure without departing from my invention.

The openings D at the sides of the car will be of different lengths, according to the framing of the car. In some cars wood posts are used, and metallic cross pieces; the car shown has cross braces of wood with vertical ties of metal; but the construction of all the cars now in common use is such that my invention can be readily applied to them with little trouble.

In some instances, the openings D may be continued across each end of the car, but I prefer to make the openings D only at the sides.

I claim as my invention—

1. A freight car having suction exhaust cowls communicating with the interior of the car above the load line and having a false floor and openings in the lower portion of the car below the false floor, the body of the car between the false floor and the exhaust opening being tight so that the car will be vertically ventilated, substantially as described.

2. The combination in a freight car, of the permanent floor, and the perforated movable floor above it, with suction exhaust devices for carrying away the foul air, said exhaust devices being situated at the top of the car, inclined inlet openings formed in the sides of the car at or near the floor line with an outer lip *d* extending down to or below the line of the permanent floor and overhanging said opening, so as to direct the current of incoming air up against the false floor and separate rain, &c., therefrom before it passes into the car, and also hinder the entrance of dirt into and prevent theft from the body of the car, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RICHARD M. PANCOAST.

Witnesses:

HENRY HOWSON,

JOSEPH H. KLEIN.