(No Model.) 3 Sheets—Sheet 1.

R. M. PANCOAST.

VENTILATED CAR.

No. 422,618. Patented Mar. 4, 1890.

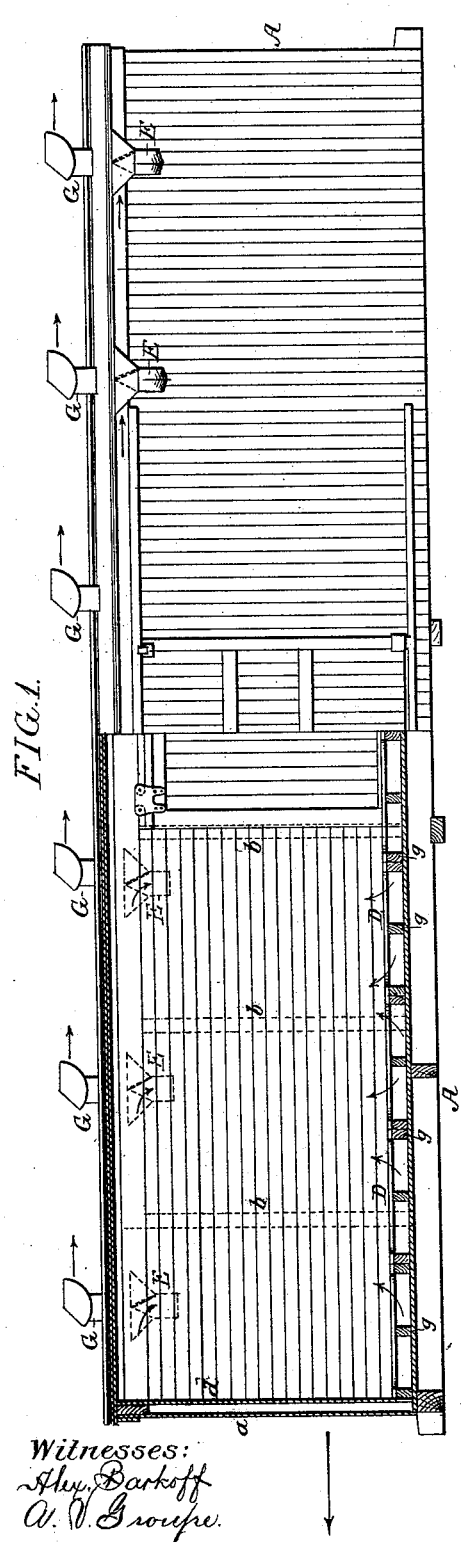

FIG. 1.

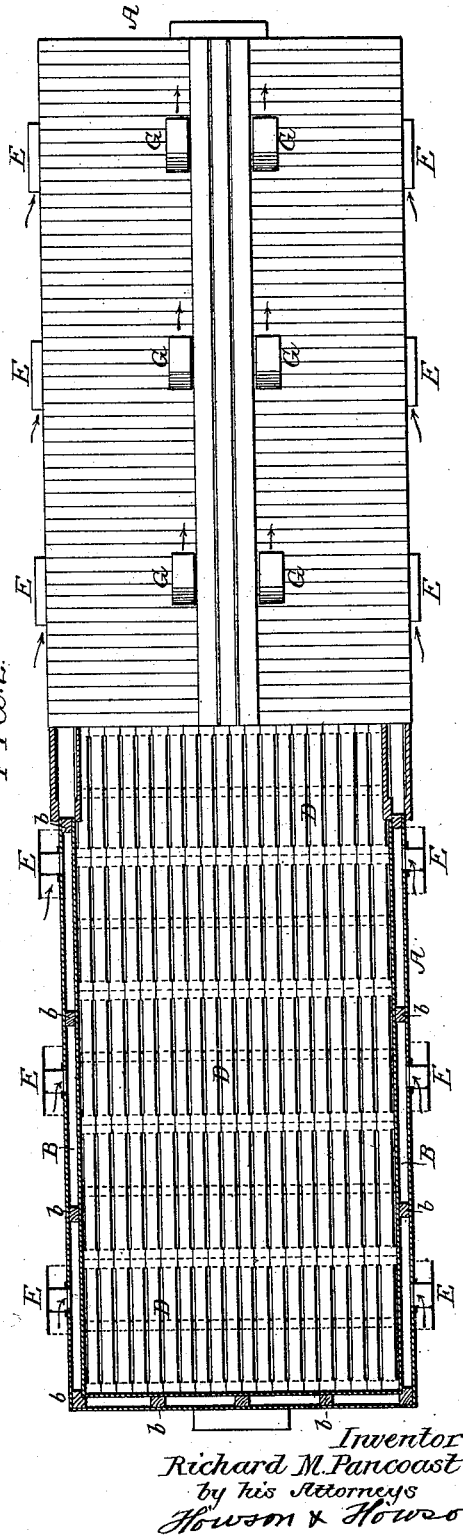

FIG. 2.

Witnesses:
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A. V. Groupe.

Inventor:
Richard M. Pancoast
by his Attorneys
Howson & Howson

(No Model.) 3 Sheets—Sheet 2.

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FIG. 4.

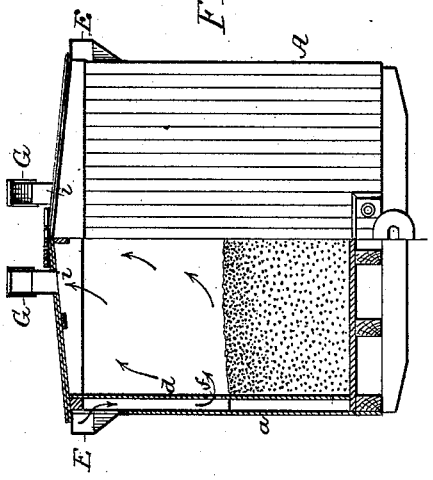

FIG. 3.

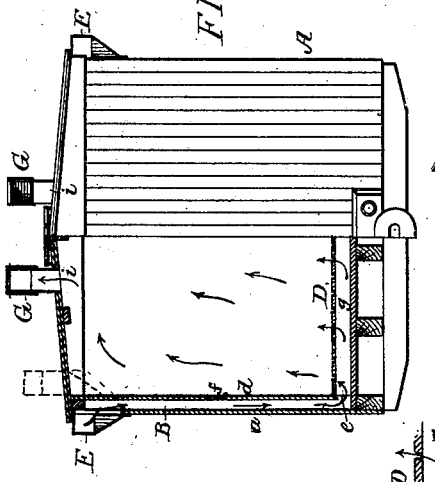

FIG. 5.

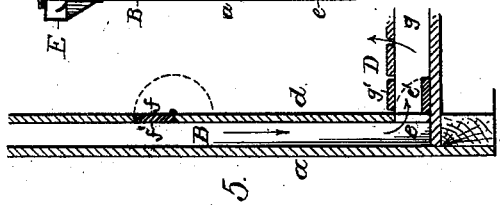

FIG. 9.

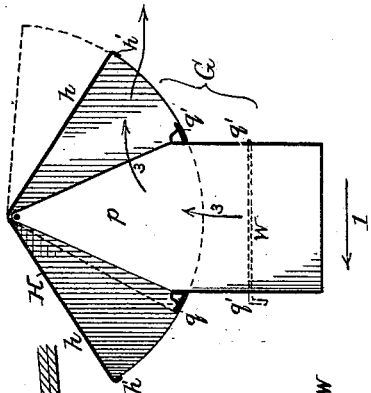

FIG. 7.

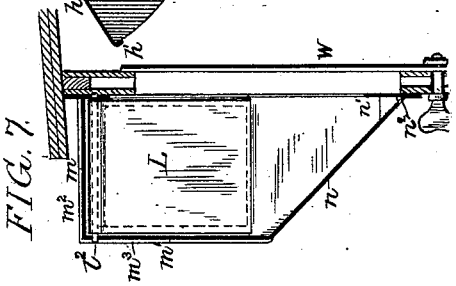

FIG. 10.

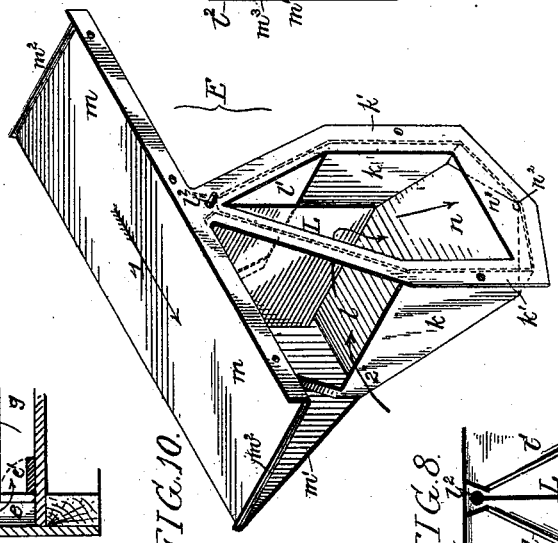

FIG. 8.

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(No Model.) 3 Sheets—Sheet 3.

R. M. PANCOAST.

VENTILATED CAR.

No. 422,618. Patented Mar. 4, 1890.

FIG. 11.

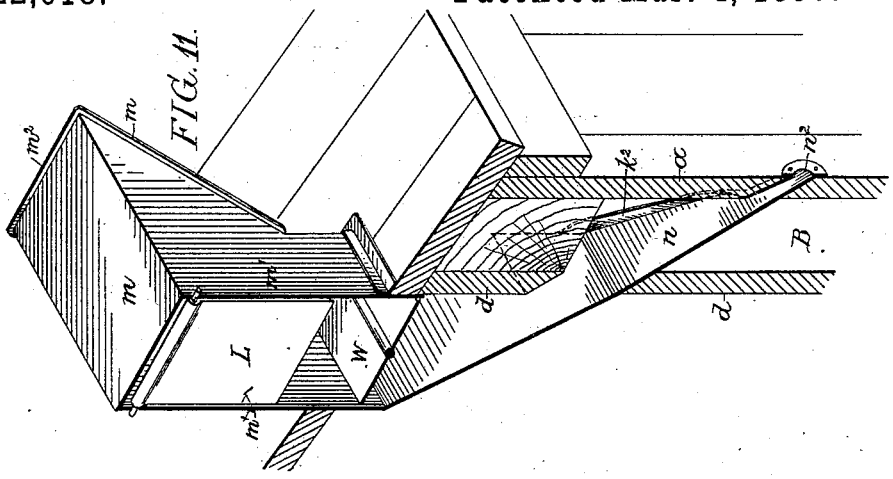


FIG. 13.

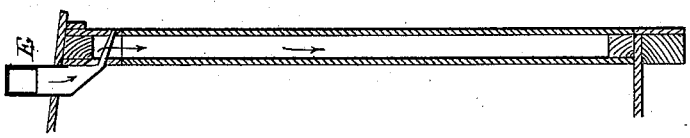


FIG. 12.

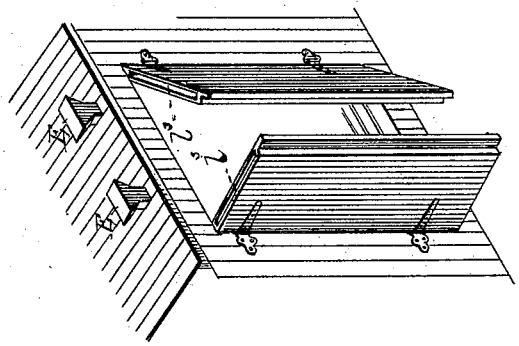
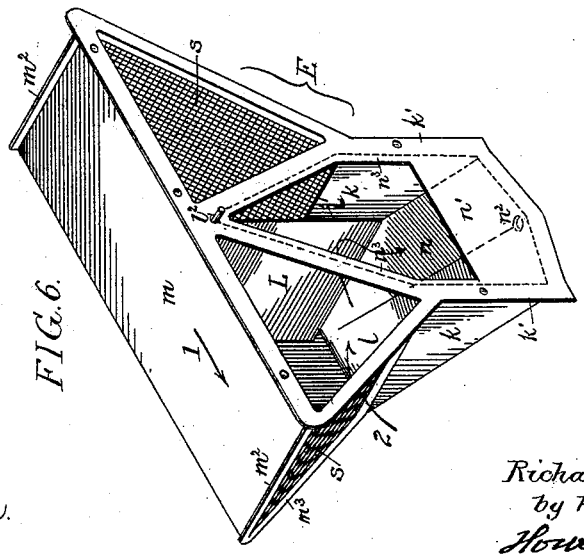


FIG. 6.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

RICHARD M. PANCOAST, OF CAMDEN, NEW JERSEY.

VENTILATED CAR.

SPECIFICATION forming part of Letters Patent No. 422,618, dated March 4, 1890.

Application filed September 28, 1889. Serial No. 325,359. (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, State of New Jersey, have invented certain Improvements in Ventilated Cars, of which the following is a specification.

My invention relates mainly to the ventilation of freight-cars used for carrying fruit, grain, or other products; but it will be understood that passenger-cars may be ventilated by my system.

The object of my invention is to construct a car for carrying fruit, vegetables, or grain, &c., in bulk or packages which will be so constructed as to thoroughly ventilate the fruit or grain, &c., the air being admitted through or above the fruit, grain, &c., as fully described hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of my improved car. Fig. 2 is a sectional plan view. Fig. 3 is a transverse view, partly in section, showing the false bottom applied. Fig. 4 is a transverse view, partly in section, showing the false bottom removed and the car constructed to carry grain, &c., in bulk. Fig. 5 is an enlarged view of a portion of Fig. 3. Fig. 6 is a perspective view of the inlet-cowl. Figs. 7 and 8 are sectional views of the inlet-cowl. Fig. 9 is a sectional view of the outlet-cowl. Fig. 10 is a perspective view of a modified form of inlet-cowl. Fig. 11 is a sectional view of the inlet-cowl as applied to the roof of a car. Fig. 12 is a perspective view of the door portion of a freight-car, showing the ventilating-passages continued through the door; and Fig. 13 is an enlarged sectional view of the same.

In constructing freight-cars for carrying vegetables or fruit, &c., in bulk or in packages it is necessary to ventilate the car thoroughly, so as to carry off the sweat, heat, &c., that is exhaled from the produce; otherwise portions of the load will show wilt and soft-rot. Cars have been constructed to overcome this difficulty; but in the majority of cases the sun-rays and heat gain access to the interior of the car through the ventilating-openings and dust and dirt pass into the car, thus destroying to a certain extent the fruit or produce; and where grain or produce is packed in a car in bulk the cars have simply been ventilated by slat-work at the side or interior, or by screen-doors or exhaust-cowls at the top, which methods merely permit a haphazard ventilation of a portion of the space above the load, and do not insure a positive carrying off of the destructive exhalations from the produce. I overcome these objections by constructing the car in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

A is the body of the car, the frame-work of which is of the ordinary construction. The outer shell of the car is made perfectly air-tight, and the doors are so arranged that the dust will not penetrate through the openings.

b b are the usual vertical standards of the car, to which the outer shell is secured, and I secure on the inner side of these standards the inner shell *d*, which extends from top to bottom of the car, forming an air-space B between the two shells *a* and *d*, allowing the free circulation of air therein.

Where cross-braces are used to stiffen the frame of the car, I make these cross-braces narrower than the air-space B, so that the air can pass freely around these braces.

As shown in Fig. 5, I prefer to construct the car with two inlet-openings in the shell *d*, one inlet-opening *e* being near the bottom of the car, while the other opening *f* is about half-way between the bottom and top of the car, or at the grain-line. Each opening is provided with a door or damper, which can be opened or closed and secured in either position by any suitable devices now in common use. I have shown in the drawings the doors *f'* and *e'* hinged, but they can be entirely removed, if necessary, or the openings may be so formed that the door of one opening can be removed and replaced in the other opening to close it; or where ventilation is not necessary—such as in cold weather or in passing through cold districts—both doors may be closed, cutting off and preventing the circulation of air through the load. When the lower opening *e* is open, as used for fruits, &c., in packages, I provide a false floor D, composed of stringers *g* and slats *g'*, so as to allow the air to enter to the load below the

false floor and pass through the openings formed by the slatted work and penetrate the boxes or baskets of fruit or produce; but where produce or grain in bulk is carried in the car the opening *e* is closed and the opening *f* opened and the false floor D removed, as it would be impossible to pass the air through the body of grain or small produce in bulk. Therefore the opening *f*, being on or slightly above the line of grain or produce, carries off the heat or moist air from the top of the grain.

Outlet-openings *i* are formed preferably in the roof of the car, through which the air is exhausted, so that it will be seen that a constant circulation of air through the car is assured, whether in the case of produce or fruit in bulk, or whether it is in crates or baskets. In some cases large fruit or vegetables in bulk can be carried with the false floor, as the air can readily pass between the fruit and be exhausted from the top.

The inlet-cowl which I prefer to use is shown in Figs. 6, 7, 8, 10, and 11 of the accompanying drawings and the outlet-cowl is clearly shown in Fig. 9. The inlet-cowl E, I prefer to place either along each side of the car directly under the eaves of the roof or on the roof near the edge, as shown in Fig. 11. The cowl when situated under the eaves of the roof communicates directly with the air-space B of the car. The inlet-cowl is provided with ribs m^2 on its upper surface and ribs m^3 on the inclined surface of the outer sides, so that any drip-water from the roof of the car will be prevented from entering the cowl, owing to the ribs, the ribs directing the water down the sides of the cowl and past the opening. The inlet-openings of the cowl may be provided with a screen *s*, as shown in Fig. 10, to prevent large cinders from entering the cowl and to break the force of the rain as it strikes the cowl. The bottom plate *n* of the cowl can be made guttered, as shown in Fig. 6, or flat, as shown in Fig. 10, and the gutter guard-plate *n'* may be of different height to catch the dust and rain-water, and the cowl may be flanged at n^3 to prevent the rain beating in at the sides. Where the cowl is mounted on the roof of the car, as shown in Fig. 11, the inclined bottom plate *n* extends down through the inner sheathing *d* of the car to the outer sheathing *a*, the opening n^2 being formed in the outer sheathing to carry off the rain-water and dust. Lips k^2 on the bottom plate are turned slightly over, forming a dirt-separator to carry off rain-water and dirt and prevent either passing over the sides into the air-space.

The inlet-cowl E has sides *k k*, flanged at *k'*, so as to be readily secured to the car. The upper portion of the sides of the cowl are tapered, and in these tapered portions are cut the inlet openings *l l'*, and between these tapered portions is pivotally suspended the deflecting-plate L, pivoted at l^2.

The cowl E has a hood composed of a top plate *m* and an inclined back plate *m'*. The bottom *n* of the cowl is inclined toward the car, and at the bottom of the cowl is a dirt and water separating arrangement consisting of a trough or gutter *n*, with an outlet n^2 for carrying off rain-water or dust that may gain access to the cowl. If, for instance, the car carrying the cowl is going in the direction of the arrow 1, Figs. 6 and 10, the deflector-plate L will be forced over against the side *k*, having the opening *l'*, and the air will rush in through the opening *l*, as shown by the arrow 2, Figs. 6 and 10, and strike the deflector-plate and pass down through the air-space B into the body of the car. Should rain-water and dirt or heavy dust gain access to the cowl from its greater impact, being heavier than the clear air, it will strike the deflector-plate L or side *k* and flow down the inclined bottom plate *n* and out through the outlet-opening n^2. Thus it will be impossible, owing to the peculiar construction of the cowl, for rain-water, dirt, or heavy dust to pass into the air-space and into the car. If the car is going in the reverse direction to that shown by the arrow 1 in Fig. 6, the deflector-plate L will swing over and close the opening *l*, and the air will pass through the opening *l'* into the air-passage B.

The exhaust-cowls G, I place, preferably, near the center of the roof of the car, as shown in Fig. 3, and each cowl has tapered sides *p*, and pivoted to the upper portion of the side plates is a hood H, having top plates *h h*, at the outer ends of which are lips *h'*, which pass over lips *q* on the sides *q'* of the cowl when the hood is forced into either of its extreme positions, so as to completely cut off the access of rain or dust in the cowl. If the car is moving in the direction of the arrow 1, Fig. 9, the force of air against the hood will move it to the position shown by dotted lines in said figure, causing the air to pass up and exhaust through the cowl, as shown by the arrow 3 in said figure. If the car is moving in the reverse direction, the hood will be reversed and the air will pass out.

I have shown in Figs. 1 and 2 of the drawings a number of inlet and exhaust cowls; but it will be understood that the size of the cowls and the placing of them in position on the car will depend considerably on the construction of the car itself and the material with which it is loaded.

Each cowl may be provided with a damper W, as shown in Figs. 7 and 11 and by dotted lines in Fig. 9, so that the air can be cut off entirely from entering or exhausting from the car when the atmosphere is too cold to admit of the free circulation of air through the car.

In place of using a damper in the inlet-cowl both the openings *e* and *f* may be closed, gaining the same result, with the exception that the air-space B will be a cold-air space instead of a comparatively warm space.

In place of the sliding door, as shown in Figs. 1 and 2, hinge-doors may be used, as

shown in Figs. 12 and 13, having air-passages l^3, so that when the door is shut, as shown in Fig. 13, air can pass through the passages in the door from the inlet-cowl. Thus a circulation is obtained throughout the entire side of the car. Sliding doors may be also provided with air-passages, if required.

I claim as my invention—

1. The combination, in a car, of the air-space in the sides of the car with inlet-cowls communicating with said air-space, with an opening at or near the bottom of the inner shell forming the air-space to allow the air to pass into the body of the car, with a perforated false floor on which the contents of the car are supported, and with an outlet-cowl on the roof of the car and communicating with the interior of the car, so that air passing into the inlet-cowl will pass down the air-space and into the body of the car at the bottom, up through the contents, and out through the top of the car, substantially as specified.

2. The combination of the car having air-spaces at the sides with an inlet-cowl at the top of the car communicating with said air-space, with openings in the inner wall or shell of the car, and with an outlet-opening communicating with an outlet-cowl, so that the circulation of air may be had which will pass through the inlet-cowl, down the air-space at the side of the car, and into the car either through or above the load and out through the outlet-cowls, substantially as described.

3. The combination, in an inlet-cowl, of the tapered sides having inlet-openings therein with a pivoted deflecting-plate adapted to close one of said openings, with an inclined bottom plate and a gutter-way, and with an outlet-opening to allow the rain-water and dust to pass away from the cowl, substantially as specified.

4. The combination, in an inlet-cowl, of the hood portion, and the pivoted deflector in said portion with an inclined bottom plate passing into and through the air-space, and with flanges l^2 on the bottom plate, substantially as and for the purpose described.

5. The combination, in a car having side air-passages with doors, of air-passages in said doors with cowls above said air-passages for directing air into said passages, and with outlets in said door communicating with the interior 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,

HARRY SMITH.