F. D. JACOBS.

CAR VENTILATING SYSTEM.

APPLICATION FILED DEC. 31, 1907.

901,010. **Patented Oct. 13, 1908.**

2 SHEETS—SHEET 1.

Fig. 6.

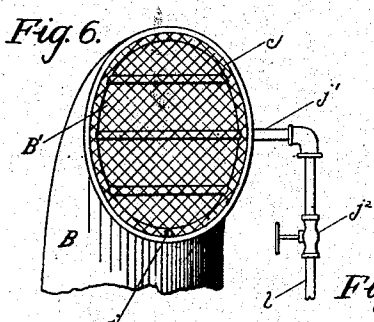


Fig. 4.

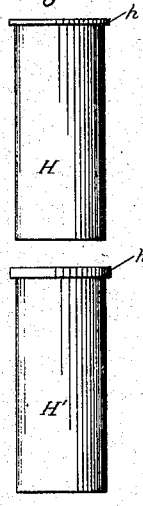
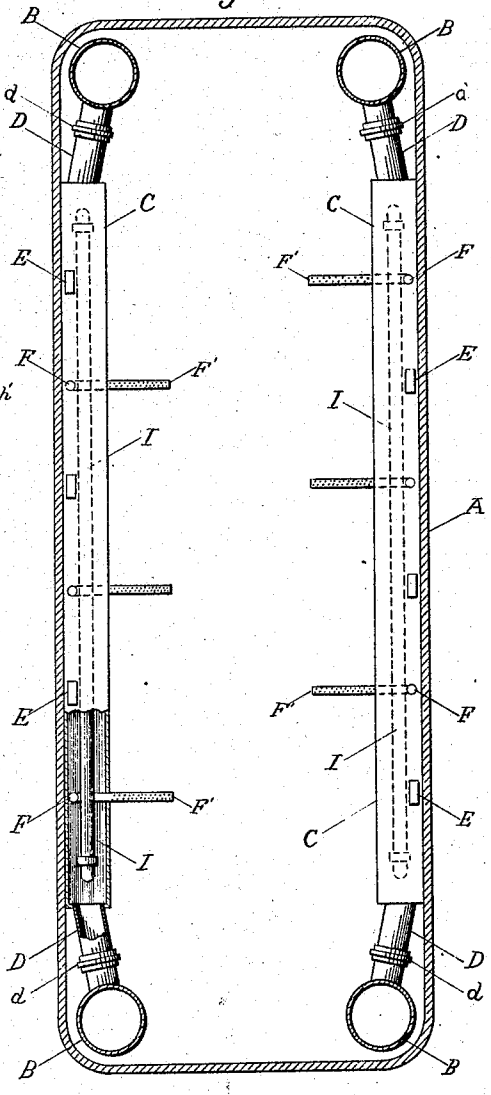


Fig. 3.

Fig. 1.



Witnesses

Roland Free

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2 SHEETS—SHEET 2.

Fig. 5

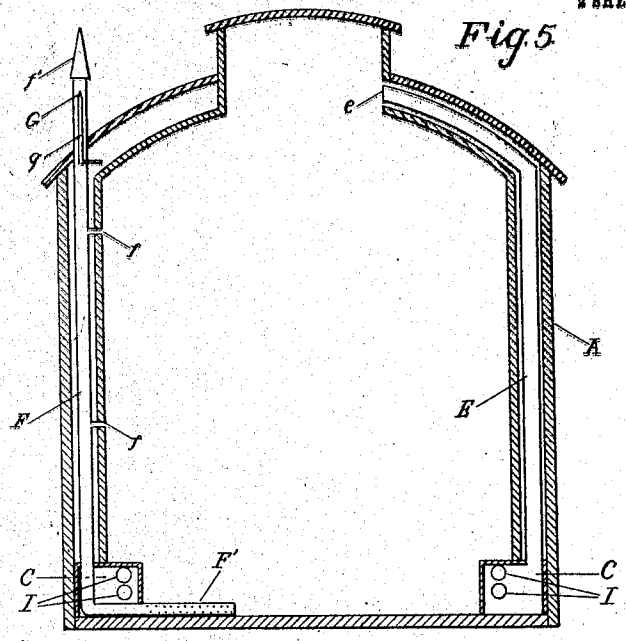
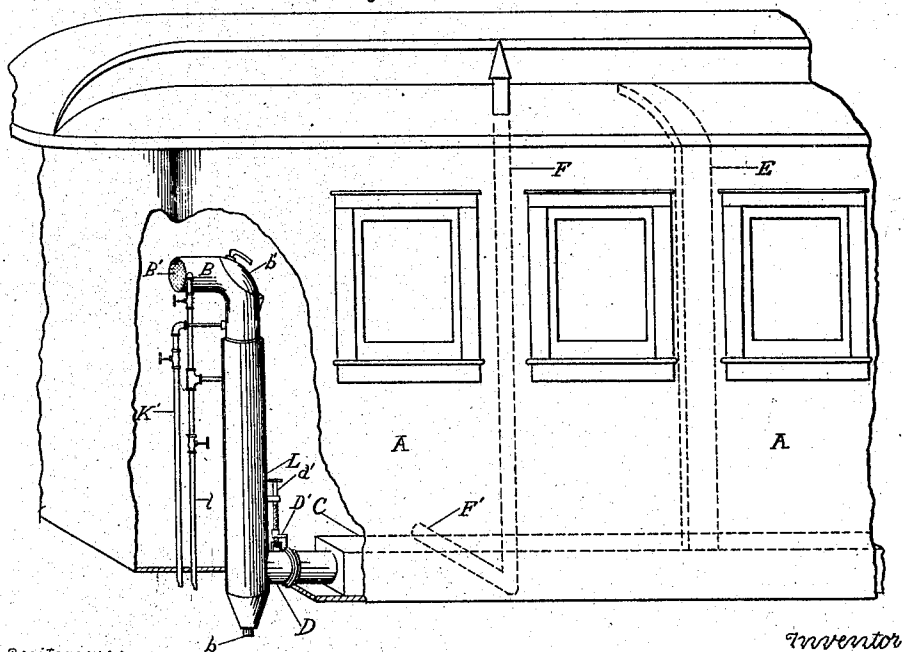


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

FRED DAVIS JACOBS, OF PAW PAW, MICHIGAN.

CAR-VENTILATING SYSTEM.

No. 901,010. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed December 31, 1907. Serial No. 408,849.

To all whom it may concern:

Be it known that I, FRED DAVIS JACOBS, residing at Paw Paw, in the county of Van Buren and State of Michigan, have invented a new and Improved Means of Car-Ventilating Systems, of which the following is a specification.

My invention relates to improvements in ventilating railway passenger cars, and has for its objects the provision of a device by means of which all air entering the car shall be made to pass through a filtering device equipped with a combination of charcoal and water so employed as to cleanse the air of impurities such as cinders, dust, smoke, etc.; and, to provide against sudden changes of temperature, cold drafts, and the breathing of exhaled air. To accomplish these objects, I position in each corner of the car an inlet stack or conduit connected with casings containing steam heating pipes, and having supply pipes running therefrom to the top of the car, through which air is distributed to the interior thereof.

In order to cleanse the air of impurities, I provide each inlet stack with removable vertical cylinders containing charcoal of suitable sized pieces to admit of the free passage of air. In the top of each stack, and directly above the cylinders, is placed a detachable sprinkling device suitable for purposes of spraying the charcoal with water, which, in conjunction with the said charcoal, operates to purify, and in warm weather to cool, the air passing therethrough.

The use of steam as a medium of filtration as heretofore designed in my former Letters Patent Number 871,938, November 26th, 1907, car ventilating systems, would not be entirely effective because the indraft of air through the inlet stack would carry certain portions of the filtering steam into the horizontal casings at the sides of the car, depositing therein more or less fine cinders and dust, which later would become dried and carried to the interior of the car. In warm weather, another objection to the use of steam for filtering purposes, is, that it would tend to raise the temperature of the air operated upon.

To overcome the objections above referred to, I purpose to use a combination of charcoal and water in the manner heretofore set forth, and as is hereinafter described and illustrated by the following drawings; in which—

Figure 1 is a horizontal sectional view of a car with my ventilating apparatus therein; Fig. 2 is a portion of a side elevation of a car showing the inlet stack in perspective; Fig. 3 is a vertical cross-section of the inlet stack in which my filtering device is shown in detail; Fig. 4 is a vertical view of the cylinders removed from the inlet stack; Fig. 5 is a vertical cross-section of the car with relative positions of portions of the ventilating apparatus shown; Fig. 6 is a view in perspective of the screened opening of the inlet stack, showing steam radiator, steam connecting pipes, and vent.

In all the views similar parts are designated by similar letters.

The car is represented by the character A, and in each corner thereof is positioned an inlet stack B, the opening of which is through the corner of the car between the floor and the roof. B′ is a screen placed across the opening of stack B.

C represents casings extending the length of the car at each side, and connected with stacks B at the ends of the car by means of short lengths of pipes D, having valve casings *d* therein, in which are gate-valves D′ having threaded sockets to receive a screw-shaft *d′* for returning said valve.

E represents conduits, connecting casings C with opening *e* at the top of the car, for the purpose of conveying fresh air to the interior thereof.

F represents pipes extending perpendicularly between the side-walls of the car, connecting the interior of the car with the exterior thereof, and having horizontal extensions F′ under the seats between the aisle and the side-walls. The foul air of the car is expelled therefrom through pipes F and F′. A hood *f′* is placed on the top of each pipe F to prevent the ingress of snow or rain.

G is a blower operated by compressed air (or steam), and is connected with a compressed air tank (not shown), or with a convenient source of steam supply, by pipe *g*.

The purpose of G is to maintain a draft in pipe F and consequently a continuous circulation of air through the entire ventilating system.

When my ventilating system is applied to sleeping cars, ducts *f* connect each adjacent berth with pipes F, so that the foul air may be removed from, and fresh air supplied to, each berth, if desired; the openings of said connections *f* being closed or open by means of a damper of suitable construction.

H and H′ are removable vertical cylinders with perforated bottoms for the passage of water, and having collars *h* and *h′* encircling their tops to retain them in exact position within stack B, *h′* being so constructed as to receive the bottom of H, which is held in position thereby. Encircling the interior of stack B near the bottom, and for the purpose of holding cylinder H′ in position, is shoulder b^2. The said cylinders are filled with charcoal and placed within stack B as shown in Fig. 3, for purposes to be hereinafter described.

I represents steam heating pipes in each casing C, having connections with any source of steam supply, and suitable return pipes (not shown) for the water of condensation.

J is a steam radiator placed contiguous to screen B′, and for the purpose of melting snow or sleet which might otherwise clog screen B′, and thus impede the supply of air to the car. Radiator J is connected by means of a short length of pipe *j′* to steam pipe *l*, j^2 being a valve to control the flow of steam therethrough, and *j* the vent.

K is a detachable sprinkling device, positioned in each stack B directly above cylinders H and H′, for the purpose of spraying the charcoal, contained in said cylinders, with water.

K′ is a pipe connected with any source of water, such as the engine tender tank, and is connected with sprinkler K by a short length of pipe *k′*, the flow of water therethrough being controlled by a valve k^2.

k is a threaded socket to receive sprinkler K which is made detachable thereby for the purpose of removing cylinders H and H′.

b^2 is a hinged lid for the purpose of removing cylinders H and H′.

It is apparent that the water used in sprinkling the charcoal contained within the said cylinders, will percolate downwardly through the charcoal, escaping through the aperture *b*, carrying with it the dust and other impurities filtered from the air by the combined action of the charcoal and water. It is also apparent that the action of the charcoal and water will cool the air passing therethrough in warm weather. The amount of dust etc., that enters the stack B is minimized, however by the position of its opening between the floor and roof of the car, as it is too low to catch the smoke and cinders of the locomotive, and too high to catch much of the dust raised by the passage of the train. Said openings are screened also, to reject larger portions of flying matter. The openings to stacks B external to screens B′ may be closed by shutters of suitable construction for the exclusion of dust, snow, or other matter when a stack for any reason is not in use.

The lower ends of stacks B are formed conical-shaped, with central openings *b* for the outlet of the water from sprinkler K, and to prevent freezing of said water in either the cylinders H and H′ or outlet *b*, I incase each stack with a jacket L having its outlet L′ surrounding the exit *b*, and connect the upper end of the jacket L with the pipe *l* by means of a length of pipe *l′*, the flow of steam therethrough being controlled by a valve l^2.

When the car is in service, the working arrangement of the gate-valves D′ is very important, and in cold weather, should be adhered to strictly, as a proper arrangement of these valves insures a uniform temperature throughout the entire length of the car, for the reason that the air in the heating cases is cooler at the point of entrance and becomes warmer as it recedes from said point, hence—on one side of the car, if the forward valve be open, the rear valve should be closed; while on the opposite side of the car, the forward valve should be closed and the rear valve open.

I am aware that a combination of charcoal and water has been used to cool the air drawn into buildings for breathing purposes but this is not the purpose of my invention.

What I claim is—

1. In a ventilating system, the combination of a vertical inlet stack, removable vertical cylinders for the reception of charcoal and having perforated bottoms for the exit of water of filtration, a detachable water sprinkling device situated in the upper portion of said stack for the purpose of saturating said charcoal with water, and an outlet at the bottom of said stack for the egress of the water aforesaid, together with the impurities extracted from the air, substantially as shown and described.

2. In a ventilating system the combination of removable vertical cylinders, an inlet stack, a shoulder encircling the interior of said stack to retain the said cylinders, a detachable water sprinkling device, an outlet at the bottom of said stack, and a steam-jacket surrounding said stack for purposes herein set forth substantially as described.

3. In a ventilating system the combina-

tion of an inlet stack, a screened opening at the upper end of said stack to exclude flying matter, a steam radiator placed across the said opening of said stack in juxtaposition to the said screen to melt snow or ice, a vent for the escape of steam from the aforesaid radiator, removable vertical cylinders and a hinged-lid near the top of the said inlet stack to permit of the removal of said cylinders; all as substantially shown and described.

In testimony whereof, I hereto affix my signature, in the presence of two witnesses.

FRED DAVIS JACOBS.

Witnesses:

A. LYNN FREE,

EUGENE COOLEY.