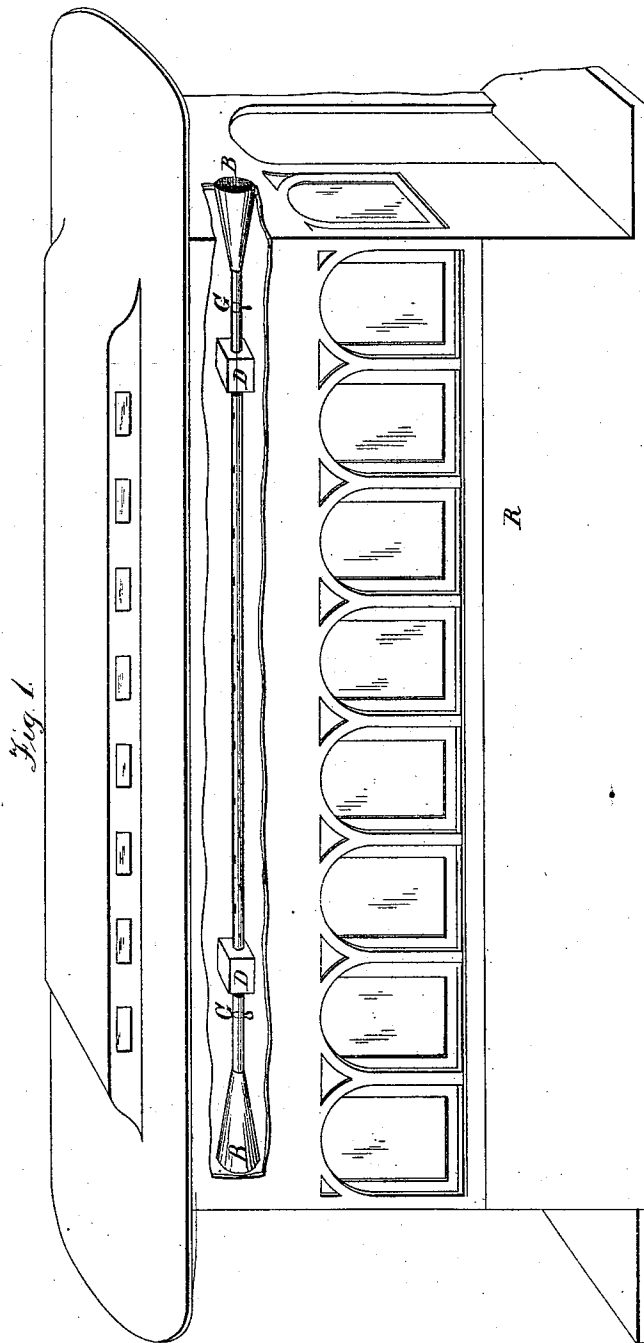


J. A. HALL & J. M. LEUZARDER.

VENTILATION OF CARS.

No. 179,303.

Patented June 27, 1876.



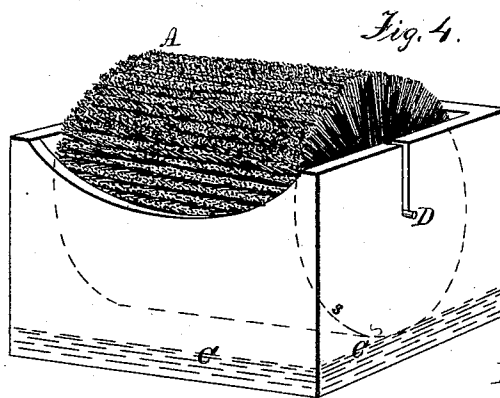
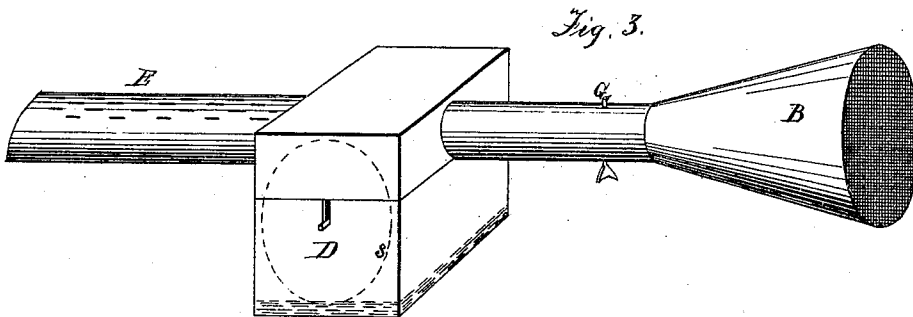
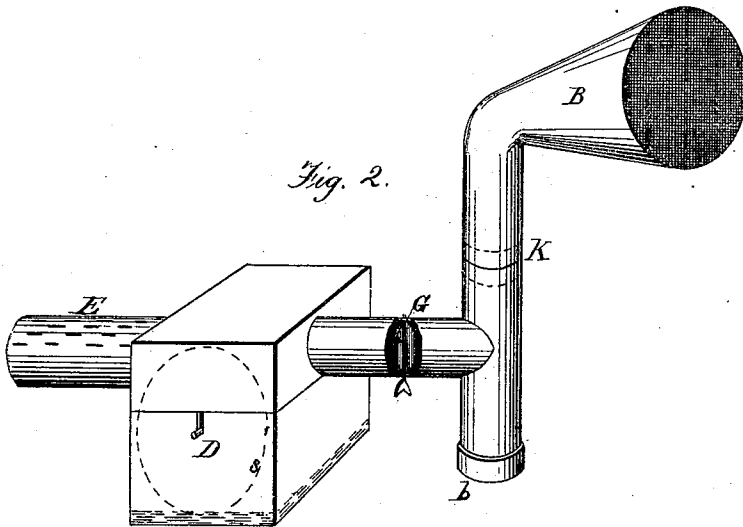
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UNITED STATES PATENT OFFICE.

JAMES A. HALL, OF DAMARISCOTTA, MAINE, AND JULES M. LEUZARDER,
OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN VENTILATION OF CARS.

Specification forming part of Letters Patent No. **179,303**, dated June 27, 1876; application filed
March 28, 1876.

To all whom it may concern:

Be it known that we, JAMES A. HALL, of Damariscotta, Lincoln county, Maine, and J. M. LEUZARDER, of Boston, Suffolk county, Massachusetts, have jointly invented a new and useful Improvement in Ventilation of Railway and other Cars, which invention is fully set forth in the following specification, reference being had to the annexed drawings and letters of reference marked thereon.

The object of our improvement is to supply cars, such as are used on railways, while in motion, with air, cool and freed from dust, smoke, and other impurities, and with such air furnish proper ventilation to all the passengers who may be in the car.

Our invention consists essentially of a revolving brush or equivalent device, located in a tank of suitable size and shape, and partially filled with water, and with proper openings outward to the end of the car forward, to admit the air, and so arranged that the air forced inward through the pipe by the rush of the car shall pass over the upper edge of the brush, causing it to revolve and cool and clean the air before it passes into the car.

We are aware that it is not new to admit air to cars through pipes opening forward, so as to give impetus to the air through the motion of the car, and that it is not new to pass air thus admitted through water to remove dust and other impurities. Our invention is an improvement on such devices.

In carrying out our invention, we provide beneath or within or near the floor of the car, or in any suitable position, a pipe of size required, preferably, for ordinary cars, of three inches, or more or less. This pipe should have an enlarged or funnel-shaped opening, outward, so as to catch the air in sufficient quantity. This pipe we lead back to a tank of cylindrical or other suitable shape, in which is hung a revolving brush, the axis of which is transverse to the longitudinal axis of the pipe which admits the air. The pipe must be so arranged in relation to the brush that the air admitted or forced through by the motion of the car shall impinge against the upper part of the brush and cause it to revolve.

The tank is so constructed that, being ar-

ranged, as nearly as possible, on a level with the floor of the car, it shall hold a suitable quantity of water. The brush is hung horizontally in this tank, on nicely-adjusted bearings, and so as to dip the lower edge in the water. The brush, further, we may prefer to make with the bristles in spiral rows, or it may be provided with a thin metallic flange, arranged in the same way, the object being to cause the brush to revolve when the current of air passes over it.

From the tank another tube passes to the car, with perforations to allow the egress of the air into the car.

It will be observed that we contemplate moving the brush wholly by the motion of the air as it is forced in by the rapid motion of the car. This, we have discovered, may be done by causing the air to strike against the upper side of the brush. We do not limit ourselves, however, to this. The brush may be turned by a spring or other mechanical devices, if necessary and desirable.

The operation of our invention is as follows: The air driven in by the motion of the car strikes against the brush and revolves it, and the revolution of the brush brings up the water, in which the lower part is immersed. The air is thus made to pass through the wet bristles or over them, which removes therefrom the dust, smoke, and other impurities, as such impurities are removed by a shower of rain.

It should be noted that the parts are so arranged that there shall be little or no space above the brush, and the air is compelled to pass through the mass of bristles in moving over the brush. From the brush it passes to the perforated pipe, and thence into the car.

It is obvious that the apparatus may be duplicated for each end of the car; but the cylinder and brush may be located midway, and one pipe lead each way to the entrance. In this case we provide an outward funnel opening at each end, and near the end of each a valve. Between the valve and the tank we make perforations to let the air pass into the car. These openings are also provided with valves. When the car passes one way the

main valve at the rear end is closed and that forward opened, so that the air is admitted forward, but cannot escape backward. The smaller apertures are opened to the rear, and those forward are closed. The operation is reversed when the motion of the car is reversed, and thus one cylinder is made to serve for both ends of the car.

Instead of one central tank there may be two, one near each end of the car, both on the same pipe. In this case the valves are located between the tanks and ends of the pipes, so that, when the rear valve is closed and the forward valve opened, the air is driven in through the forward end of the pipe, over the forward brush, and, having no other escape, passes into the car through the openings in the pipe between the boxes or tanks. The same pipe serves the same purpose for the opposite tank and brush, when the car is moving in an opposite direction. As the tanks may be located near the ends, the whole space between is allowed for the perforated pipe, and thus an even distribution of the air is provided for, and at the same time there is a gentle diffusion without any brisk currents on the passengers.

It is obvious that the ventilator may be duplicated in this position, one for each side of the car, if it shall be found that there is not sufficient air furnished from the openings at the ends of the car. Then the air-tunnel can be placed on the top of the car and carried to the brush and tank, as in Drawing No. 2, or it may pass in a parallel line through the monitor of the car, as represented in Fig. No. 3.

In the annexed drawings, Figure 1 represents a car with our improved ventilator located on one side, near the roof; Fig. 2, a modification, when the open mouth is placed above the roof; Fig. 3, the direct arrangement; and Fig. 4 an enlarged view of the tank with top removed to show the brush.

B represents the enlarged mouth in all the

figures. G is the valve, opened for the admission of air to the car, and closed to prevent the escape when the car moves in the opposite direction. A is the brush, the position of which is represented in the tank by the dotted lines *s s*. It will be observed that the upper part rises in such relation to the pipe that the air shall be forced over this upper edge, and the lower shall dip in the water, represented by *c*. The perforated pipe E extends, as shown in Fig. 1, from end to end of the car. The vertical pipe K, in Fig. 2, extends downward and is stopped by a cover, *b*, which may be removed to allow the escape of heavier cinders. All of the enlarged openings may be covered by screens in the usual manner.

Having thus described our invention, what we claim, and desire to receive by Letters Patent of the United States, is—

1. An improved car-ventilator, consisting of a brush or equivalent device, arranged to revolve in a vessel containing water, with pipes admitting the air over the revolving brush, to remove the impurities therefrom, as set forth.
2. The car-ventilator described, consisting of the tank to contain the water, revolving brush, pipe to admit air over and against the brush, and distributing-pipe leading to the apartment and regulating-valve, as set forth.
3. The arrangement of pipe, brush, and tank, as described, the admission-pipe being joined to the tank, so as to drive the brush by motion of the admitted air, as set forth.
4. The centrally-arranged tank and pipe leading each way, with flaring openings, the valves in the pipes near the ends, and the orifices with their valves to admit the air into the car alternately, as set forth.

JAMES A. HALL.

JULES M. LEUZARDER.

Witnesses:

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J. S. DOYLE.