2 Sheets—Sheet 1.

J. E. RICHARD.

VENTILATORS FOR VEHICLES.

No. 190,369. Patented May 1, 1877.

Fig. 1.

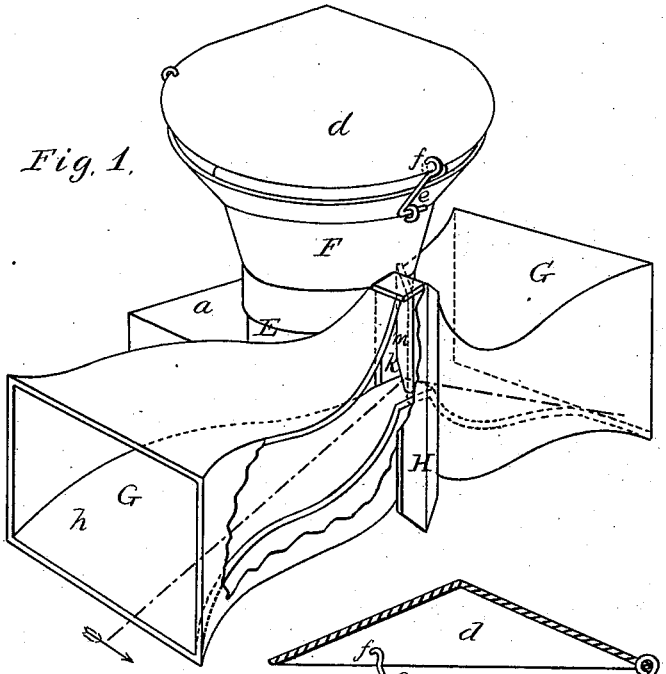


Fig. 2.

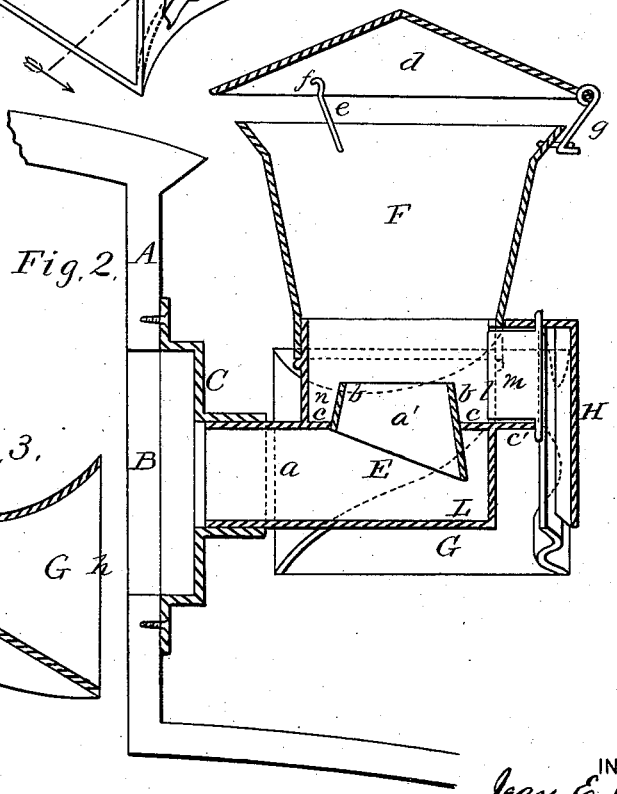
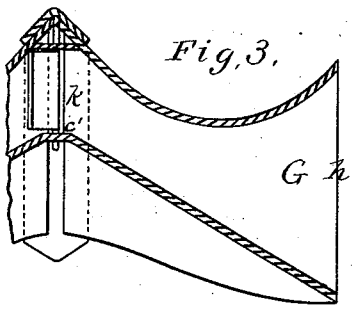


Fig. 3.



WITNESSES

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2 Sheets—Sheet 2.

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Fig. 4.

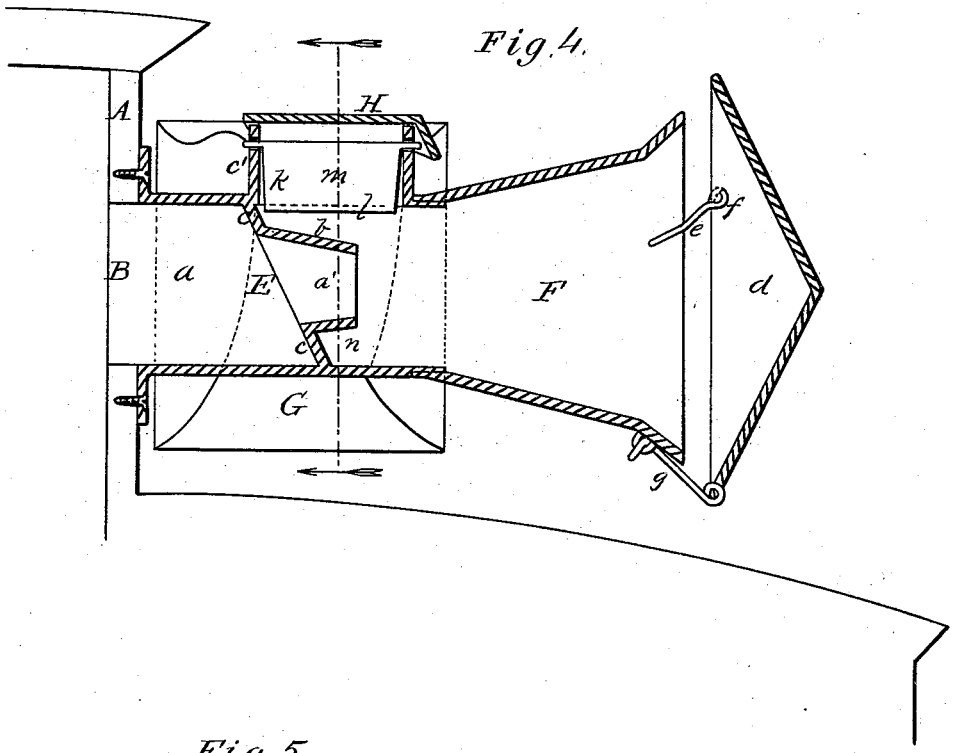
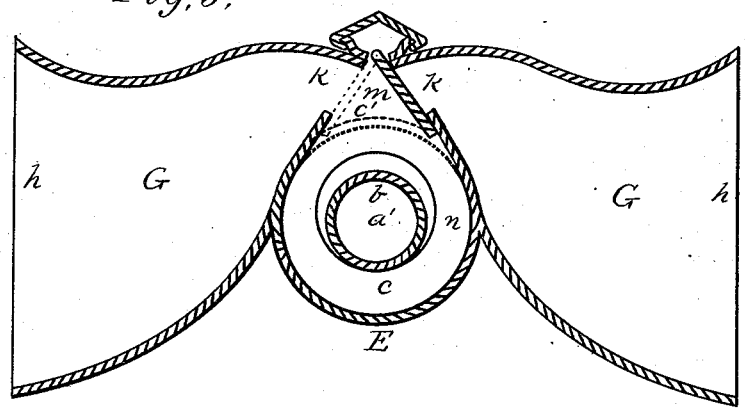


Fig. 5.



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UNITED STATES PATENT OFFICE.

JEAN E. RICHARD, OF NEW YORK, N. Y.

IMPROVEMENT IN VENTILATORS FOR VEHICLES.

Specification forming part of Letters Patent No. **190,369**, dated May 1, 1877; application filed September 16, 1876.

To all whom it may concern:

Be it known that I, JEAN ELIE RICHARD, of New York, in the county of New York and State of New York, have invented a new and valuable Improvement in Ventilators for Vehicles; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a perspective view of this invention. Fig. 2 is a transverse section of the same. Fig. 3 is a partial vertical longitudinal section. Fig. 4 is a vertical transverse section, showing the ventilator horizontally arranged. Fig. 5 is a horizontal section.

This invention has relation to means for ventilating cars and other moving receptacles; and it consists in the construction and novel arrangement of a suction-tube, having an inclined spiral wall or walls, opening by a mouth or mouths in the direction of motion, whereby the centrifugal action of a whirling current or eddy of external air is utilized to draw out the interior air, as hereinafter fully shown and described.

In the accompanying drawings, the letter A designates the upper portion of an ordinary car, to which the ventilator is applied on the outside. B indicates the ventilating-opening near the top of the car. This may be the ordinary ventilating-opening, as now constructed in cars, or it may be built expressly for this ventilator. When the induct of the ventilator is larger or smaller than the aperture of the ventilating-opening, a coupling or reducer, C, is designed to be used, connecting the ventilator with the car. D represents the suction or whirl ventilator. This consists of a body, E, spout F, and draft-mouths G. The body E is of cylindrical or rounded form, and is provided with an induct, *a*, which is designed to communicate with the ventilating-opening of the car, either directly or through the medium of a reducer or elbow. Within the body is located a concentric cylindrical flange-wall, *b*, projecting in the direction of the spout, and connected with the wall of the body by means of an annular inclined wall, *c*, which forms a continuation of the inclined spiral walls of the trumpets or mouths. The spout F forms a conical flaring extension outward of the body, and is provided with a cone-shaped cap, *d*, of larger diameter than its opening, which is connected with the spout by means of supporting-arms *e*. These may be made with hinge or loop connections *f*, in order that the cap may be swung open whenever the interior of the ventilator requires inspection. One of the supporting-arms may be made in the form of a hook, for convenient disconnection, as shown at *g*. The object of this cap is to annul the opposing effect of an adverse current of air into the spout from the outside, and to convert it into an auxiliary draft, aiding the general suction of the ventilator. G designates the draft-mouths, usually two in number, and arranged opposite each other in the line of motion of the car. These are usually rectangular in cross-section, but may be rounded. They are coniform, having a serpentine spiral shape, and their walls are gradually reduced from the enlarged flaring apertures *h* to the small neck or throat *k*, which is located exterior and tangent to the outer part of the rounded body E, that portion of the wall of the body being usually constructed common to said body, and the throat *k*, although sometimes a double wall, may be used. The annular inclined wall *c* of the body is continued, as shown at *c'*, in the wall of the draft-mouths G, passing through an opening, *l*, at the outer portion of the body, through which the draft enters. This opening communicates with the narrow portion or neck *k* of the draft-passage, and it is provided with a swinging valve, *m*, which is pivoted or hinged to the draft-case in such a manner as to be easily accessible for repairs or oiling purposes. This valve is designed to close the passage from either draft-mouth into the circular body E when the draft enters at the other, and it is operated automatically by the current. Its free edge, when closed, lies against the margin of the neck-opening *l*, and in this position its plane is so inclined that it forms a kind of connecting-wall between the wall of the body and that of the draft-mouth which is open, forming the completion of the spiral passage at this point.

H indicates an exterior slide, designed to close the draft-tube at the exterior portion of the neck, when the valve *m* is attached. This slide is removable to facilitate access to this valve, which is the only working part of this ventilator.

If the spout F is designed to project laterally and horizontally, the body E may be continued toward the car sufficiently to form a connection therewith, or with a suitable reducer; but if the spout is designed to stand upright, the body may be connected by means of a bend or elbow, L, which may be either rigidly or removably attached to its induction end. In either position the draft-mouths G are designed to open in opposite directions, but in the line of motion of the car, so that the air will enter the forward mouth or trumpet, and will be guided by its spiral wall and by the valve *m* into the annular recess *n*, exterior to the inclined flange *c*, which bounds the interior central opening *a'*, through the inclined wall or diaphragm *c*. By means of the inclined wall *c* and the concentric walls of the recess *n*, the whirling or spiral movement which the draft-current received in the trumpet G is continued and intensified, and the air is delivered to the flaring spout F in whirling motion. Here the centrifugal action and the inclination of the wall effect an enlargement of the whirls of the current, and a central suction is set up, which forcibly draws through the induct *a* and interior circular throat *a'* the air from the interior of the car, and all the dust, smoke, and other impurities floating therein, and it is impossible for dust and smoke to get into the car through the ventilator, because of the outflowing draft through the trumpet.

What I claim as new, and desire to secure by Letters Patent, is—

1. A suction-ventilator for cars and other vehicles, having a spiral draft-passage, an induct, and an exit-spout communicating centrally with the induct and tangentially with the draft-passage, substantially as specified.

2. A suction-ventilator consisting of the body portion, having an induct, *a*, annular diaphragm *c*, flanged central opening *a'*, and lateral opening *l*, the guarded exit-spout, the draft-mouth G, and the valve *m*, substantially as specified.

3. The combination, with the exit-spout, induct *a*, and tangential draft-mouths G, of the body E, having the annular flanged diaphragm *c*, and the lateral valved opening *l*, substantially as specified.

4. The combination, in a ventilator, of the spiral exterior draft-flues and the central induct, through which the exterior air is drawn by the whirling motion of the external air passing through said draft-flues, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JEAN ELIE RICHARD.

Witnesses:
VILLETTE ANDERSON,
W. C. MASI.