

No. 644,101.

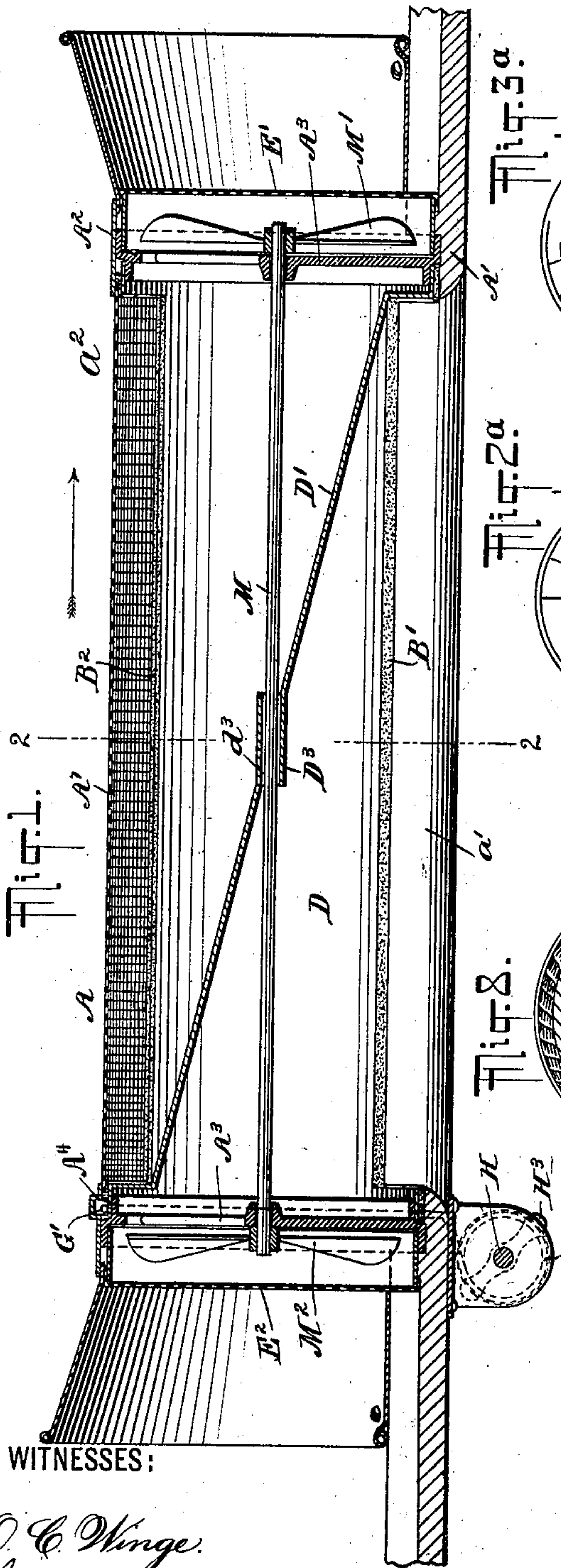
Patented Feb. 27, 1900.

L. SCHNEIDER, SR.  
EXHAUST AND SUPPLY CAR VENTILATOR.

(Application filed Jan. 5, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

O. C. Winge.  
J. B. Clautier.

Fig. 3a.

Fig. 2a.

Fig. 5a.

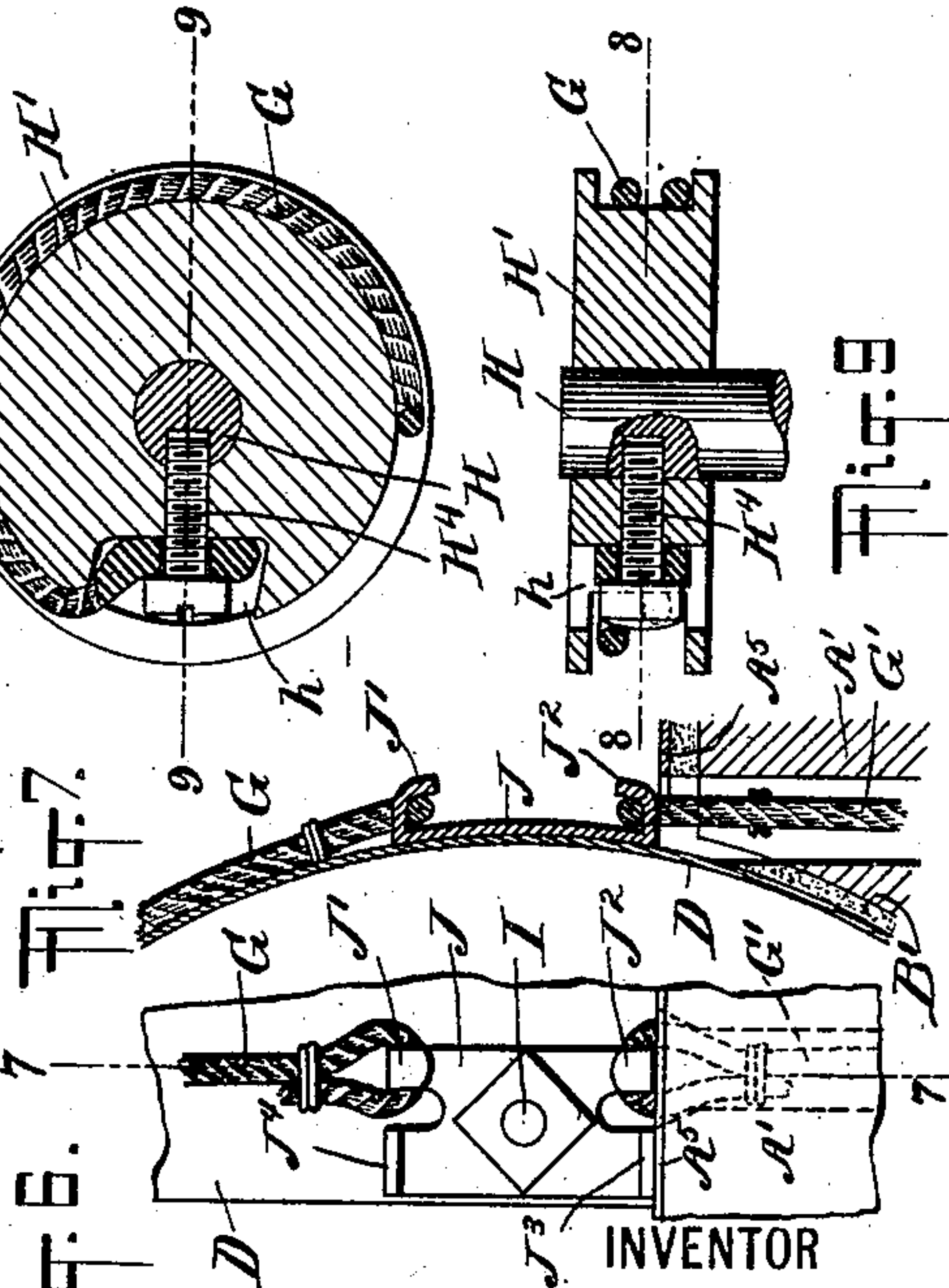
Fig. 4a.

Fig. 8.

Fig. 7.

Fig. 6.

Fig. 9.



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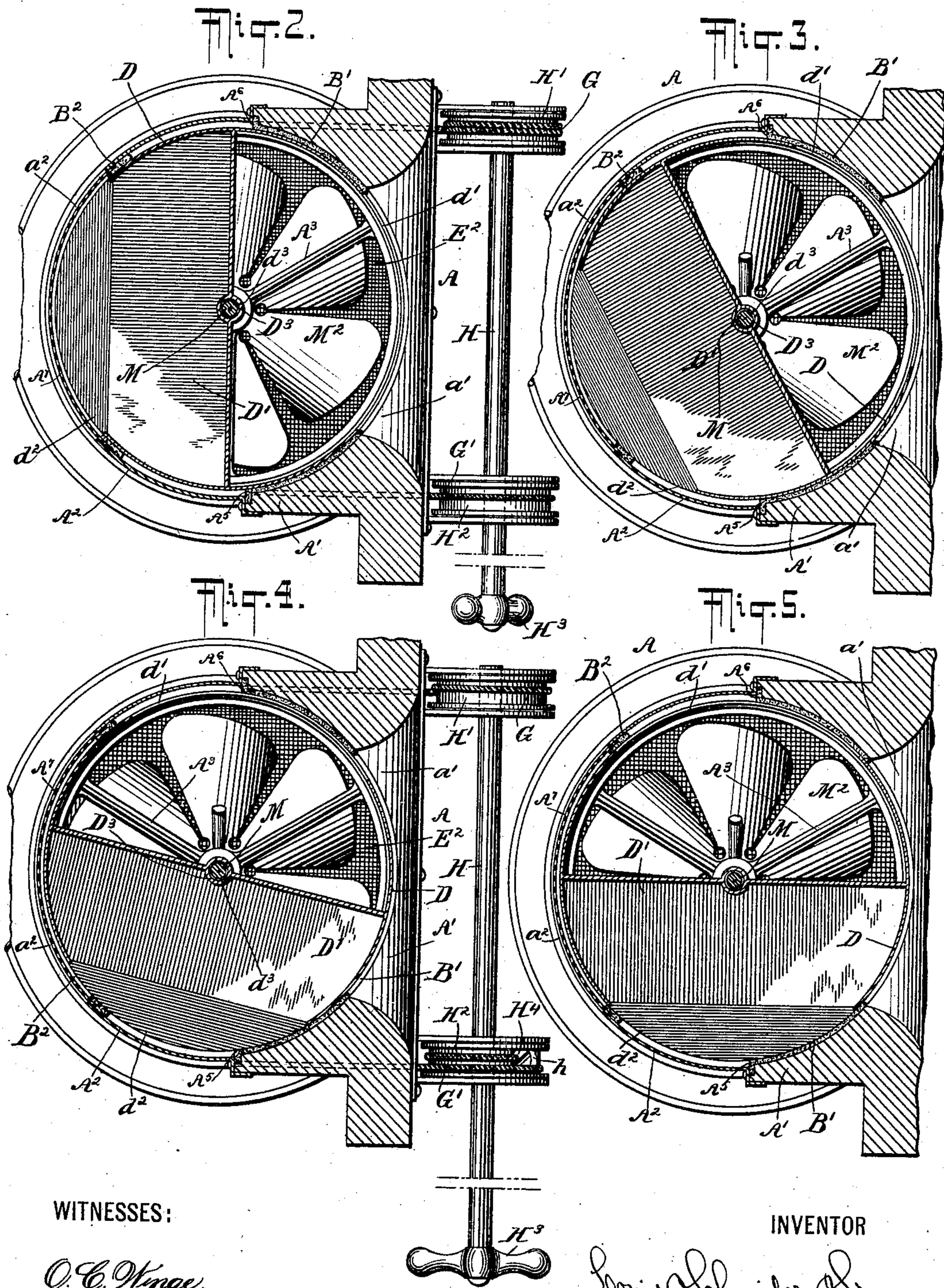
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# UNITED STATES PATENT OFFICE.

LOUIS SCHNEIDER, SR., OF WILLIAMSPORT, PENNSYLVANIA.

## EXHAUST-AND-SUPPLY CAR-VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 644,101, dated February 27, 1900.

Application filed January 5, 1899. Serial No. 701,182. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS SCHNEIDER, Sr., a citizen of the United States, residing at Williamsport, in the county of Lycoming, in the State of Pennsylvania, have invented a certain new and useful Improvement in Railroad-Car Ventilators, of which the following is a specification.

The main object of the invention is to provide for the eduction of the foul air from the car with graduated force. It is desirable to have ventilation in all weathers. In moderate weather each ventilator may be doing its utmost; but the effect should be reduced as the weather becomes extremely cold. My invention provides for graduating the effect to any required degree without requiring the addition of a register or other complication.

There may be two or any other number of my ventilators at any required positions in the roof or on each side of the car. A description of one may suffice for all. It will be understood that fresh air to supply the interior of the car is inducted by similar ventilators differently adjusted or by differently-constructed ventilators at other points or simply by the ordinary leakages.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a horizontal section. Fig. 2 is a cross-section on a larger scale. It is a vertical section on the line 2 2 at the mid-length. Fig. 2<sup>a</sup> is a diagram showing the principal portions of the same in simpler form. Figs. 3, 4, and 5 are corresponding sections, and Figs. 3<sup>a</sup>, 4<sup>a</sup>, and 5<sup>a</sup> are simpler diagrams showing the changes of the relations of the principal parts as the device is turned. Figs. 3 and 3<sup>a</sup> show the internal cylinder slightly turned from the position of full effect. Figs. 4 and 4<sup>a</sup> show the internal cylinder turned to a further extent, so as to further reduce the effect; and Figs. 5 and 5<sup>a</sup> show it turned into the middle position, so that it renders the ventilator of no effect. It will be understood that a further turning in the same direction would gradually make the ventilator effective in the opposite direction. The turning modifies the effect by bringing the oblique parti-

tion into different relations to the other parts without changing its obliquity to the axis. There is a further effect induced by partially closing certain passages when near the middle position. Fig. 6 is a side view of a portion on a still larger scale. Fig. 7 is a section on the line 7 7 in Fig. 6. Fig. 8 is a vertical section on the line 8 8 in Fig. 9. Fig. 9 is a horizontal section on the line 9 9 in Fig. 8.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A' is a horizontal partial casing. Its interior is semicylindrical and connects through the opening *a'* with the interior of the car. A corresponding aperture *a''*, having a wire screen A<sup>7</sup>, is formed in a removable portion A<sup>2</sup>, which latter is semicylindrical and is provided with convenient fastenings, which allow it to be removed at intervals for examination, adjustment, or repairs of any part. The casing A' and the cover A<sup>2</sup> when properly and firmly applied together constitute a cylindrical casing extending longitudinally of the car, trumpet-mouthed and having screens E' E<sup>2</sup> in the end portions, as shown. The two parts together may be sometimes referred to as the "cylindrical casing" A.

D is a hollow cylinder mounted in the casing, which thus constitutes a support. The said cylinder has capacity for revolving and is provided with liberal apertures *d'* *d''*, corresponding to the apertures *a'* *a''*.

D' is a partition or plate of sheet metal or other suitable material extending diagonally through the space in the interior of this inner cylinder. There is an elliptical aperture *d'''* in the center of this partition. A horizontal tube D<sup>3</sup> is secured in this opening, and through this tube the shaft passes.

G G' are wire cords secured at one end to and wound in opposite directions partially around the cylinder D near one end and extending tangentially therefrom into the car, where they are wound in opposite directions around two horizontal pulleys H' H<sup>2</sup>, which are fixed on an upright shaft H, supported in fixed bearings and provided with an operating-handle H<sup>3</sup> at its lower end, by which it may be conveniently turned. Each pulley H' or H<sup>2</sup> has a peripheral recess *h*, in which



one end of its proper cord G or G' is secured by a screw H<sup>4</sup>. The same screw serves to rigidly connect the pulley with the shaft H.

M is a slender shaft supported in slight spider-frames A<sup>3</sup> in the casing A' and carrying at the end screw-wheels M' M<sup>2</sup>. The elliptical hole d<sup>3</sup> in the oblique partition D' should match closely to this shaft without touching it. When the device stands in the position shown in Fig. 1, the motion of the car in the direction of the large arrow will induct a strong current of air at the front end, which, after acting on the screw-wheel M', and thus rapidly turning the light-running shaft M, is thrown idly outward through the opening a<sup>2</sup>. The foul air from the interior of the car can escape freely through the aperture a' into the casing A and is allowed to flow rearward through the half of the cylinder D which is in the rear of the oblique partition D'. It can thence flow away past the screw-wheel M<sup>2</sup>, where it becomes subject to the action of the latter. There is a gentle tendency to such motion due to the form and arrangement of this exhaust-passage. The rapidly-revolving screw-wheel M<sup>2</sup>, acting screw-wise, quickens the movement of the current of air so escaping—that is to say, the inertia of the outer air struck by the front screw-wheel M' induces a rapid rotation of the shaft M, and consequently of the rear screw-wheel M<sup>2</sup>, and this latter acting on the otherwise languidly-moving foul air coming from the interior of the car greatly quickens its movement rearward, so as to draw from the interior of said car with force.

When it is desired to soften the action of this ventilator, the operator by acting on the handle H<sup>3</sup> turns the shaft H and through the pulleys II' II<sup>2</sup> and cords G G' partially rotates the internal cylinder D, and thereby changes the relation of the inclined partition D'. This turning may be carried to such an extent as to completely reverse the position of this partition, in which case air is inducted into the car. I esteem the capacity for such use an important part of my device; but it is only required on rare occasions. It allows the rapid driving out of inferior air and the replacing it with pure. Ordinarily the internal cylinder and its oblique partition will not be turned so far, but will be adjusted so as to exhaust in varying degrees in cold weather with much less than its full force.

It will be observed that both ends are alike. The apparatus serves in the same manner in traveling in either direction. It simply requires reversing by properly turning the handle H<sup>3</sup> when the motion of the car is reversed for the return trip.

I is a screw tapped in the internal cylinder D near one end. By it is attached a small plate J, which I have in my experiments made of stout sheet metal of a generally-rectangular form, with four prongs or lugs on its outer face. Two of these, J' J<sup>2</sup>, engage the ends of the cords G G' and constitute the means of

attaching such to the internal cylinder D to insure its turning as the handle H<sup>3</sup> is turned. The other lugs, J<sup>3</sup> J<sup>4</sup>, serve as stops by striking corresponding stops A<sup>5</sup> A<sup>6</sup>, provided at the required points in the interior of the outer casing A' to determine accurately and easily when the inner cylinder has been turned to the full extent in one direction or the other. Thus when the turning has been continued in the direction to exhaust with full force and the stop J<sup>3</sup>, carried on the revolving inner cylinder D, strikes the fixed stop A<sup>5</sup> the arresting of the motion is distinctly felt by the operator and his effort is discontinued. When it is turned to the full extent in the opposite direction, the stop J<sup>4</sup> strikes the stop A<sup>6</sup> with a corresponding effect. Thus the judgment of the operator is required only when the ventilator is to be set in an intermediate condition, closed or partly closed. This plate J, with its several lugs, is easily removed and altered or exchanged when it becomes expedient to take up moderate slack in the cords G G' or to make any other change in the relation of these parts.

B' is a packing of felt on the casing A', and B<sup>2</sup> is also a packing of felt secured to the inner face of the removable cap or semicylinder A<sup>2</sup>. These packings are adapted to match with approximate tightness to the inner cylinder D to prevent any material leakage of air from the front side, the strong-pressure side of the partition D', to the rear side, the weaker-pressure side, that which conducts away the foul air from the interior of the car.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention. The horizontal tube D<sup>3</sup>, brazed or otherwise fitted to the aperture shown in the elliptical position, may be omitted. When applied, it should be set with just the right degree of obliquity, so that it shall match closely to the shaft M without touching it. Other means than the straps or partial hoops A<sup>4</sup> may be used to facilitate the securing of the semicylindrical casing A' to the exterior of the car. The ends of the entire casing A may be plain instead of trumpet-mouthed. The wire screens E' E<sup>2</sup>, arranged to stop cinders or other solid matter at the open ends of the casing A and also the wire screen or partial shield A<sup>7</sup>, covering the lateral aperture a<sup>2</sup>, may be omitted. The employment of the felt packing B' B<sup>2</sup> insures sufficient friction to allow the retention of the part and its attachment in any position in which they may be left without requiring any special fastenings.

I attach importance to the broad portions of the internal cylinder D, which remain between the long and deep apertures d' d<sup>2</sup>, because they not only connect the completely-cylindrical ends and firmly support the thin partition D at each edge along its whole length, but also because they partially close the apertures a' a<sup>2</sup> and further reduce the effect of the device to varying extents as the



internal cylinder is partially revolved. I also attach importance to the fact that my apparatus is adjusted by hand, because it avoids the temporary displacing which is experienced with automatic apparatus when the train stops with the wind from the rear, and I further attach importance to the wire cords or analogous flexible connections mounted in the manner shown for effecting the reversal, because they are strong and reliable and hold the parts firmly without rattling or noise of any kind.

I claim as my invention—

1. In a ventilator, the combination with a wall having an elongated horizontal opening, a support on said wall contiguous to said opening, an obliquely-located plate revoluble around a horizontal axis and sustained by said support, and means for revolving said plate to reverse its oblique position with respect to said opening, to simultaneously move the ends, the one toward and the other away from the adjacent end of the opening, substantially as herein specified.

2. In a ventilator, the combination with a wall having an elongated horizontal opening, a support on said wall contiguous to said opening, a longitudinal shaft loosely mounted in said support, and carrying screw-wheels and an obliquely-located reversible plate sustained by said support, and through which said shaft passes, and independently revolves, and means for revolving said plate around a horizontal axis to reverse its oblique position with respect to said opening to simultaneously move the ends, the one toward and the other away from the adjacent end of the opening, substantially as herein specified.

3. In a ventilator for railroad-cars and analogous carriages, the open-ended horizontal casing A, having the side apertures  $a'$ , communicating with the interior of the car, in combination with the reversible partition  $D'$ , extending longitudinally within such casing and held with a fixed amount of obliquity with respect to the horizontal axis of the casing but with capacity to be partially revolved around said axis, to simultaneously move its ends, the one toward and the other away from the adjacent end of the aperture  $a'$  to vary its effect, substantially as herein specified.

4. In a ventilator for railroad-cars and analogous carriages, the open-ended horizontal casing A having the side aperture  $a'$ , communicating with the interior of the car, in combination with the cylinder D supported within the casing and having the longitudinally-extending partition  $D'$ , the latter having capacity for being partially revolved around its horizontal axis, so as to allow said partition to be set in any required position and be held in such position by friction, as herein specified.

5. In a ventilator for railroad-cars and analogous carriages, the open-ended horizontal casing A having the side aperture  $a'$ , communicating with the interior of the car, in com-

bination with the cylinder D supported within such casing, and having the partition  $D'$ , extending longitudinally within the latter, said cylinder having capacity for being partially revolved, and the cords  $G'$ ,  $G^2$ , and connected shaft H, with its pulleys  $H'$ ,  $H^2$ , and operating means  $H^3$ , all arranged for joint operation, substantially as herein specified.

6. In a ventilator for railroad-cars and analogous carriages, the open-ended horizontal casing A, having the side aperture  $a'$ , communicating with the interior of the car, and the opposite aperture  $a^2$ , communicating laterally with the open air, in combination with the internal cylinder supported within such casing and having the partition  $D'$ , extending longitudinally within such casing, said cylinder having capacity for being partially revolved, and with the shaft M mounted in the bearings  $A^3$ , revolving in a close-fitting opening  $d^3$  in such partition, and the screw-wheels  $M'$ ,  $M^2$ , all arranged for joint operation substantially as herein specified.

7. In a car-ventilator the cylindrical casing A, extending longitudinally and having open ends and apertured sides  $a'$ ,  $a^2$ , divided longitudinally into easily-separable parts  $A'$ ,  $A^2$ , a wire-cloth covering for each end and also for the lateral aperture  $a^2$ , a partially-revoluble interior casing comprising the longitudinal cylinder D, having apertures  $d'$ ,  $d^2$ , and oblique partition  $D'$ , revoluble with said cylinder, an easily-revoluble shaft M, and screw-wheels  $M'$ ,  $M^2$ , arranged to promote the escape of the foul air, and means as the wheels  $H'$ ,  $H^2$ , and connections for reversing, adjusting, and holding the cylinder D and its oblique partition  $D'$  at will, all arranged for joint operation substantially as herein specified.

8. In a ventilator for railway-cars and analogous carriages, the car-wall having an opening and a suitable bearing contiguous thereto, revoluble plate supported in said bearing, located obliquely in juxtaposition to the opening, in combination with operating means comprising cords secured at one end to a portion connected to the plate, and a vertical shaft carrying pulleys around which said cords pass and in a recess in each of which the other ends are secured by a screw fitting the shaft, substantially as set forth.

9. In a ventilator for railway-cars and analogous carriages, the car-wall having an opening and a suitable bearing contiguous thereto, revoluble plate  $D'$  supported in said bearing, located obliquely in juxtaposition to the opening a plate J turning with the plate  $B'$  and having ears adapted to contact with fixed portions to limit the turning movement of the plate, in combination with operating means comprising cords engaged at one end to the ears of the plate J, and a vertical operating-shaft carrying pulleys around which said cords pass and to which their other ends are fastened, substantially as set forth.

10. In a car-ventilator having a cylinder D, with means for partially revolving within a



casing A and carrying a partition D' oblique to the axis of said cylinder, stops J<sup>3</sup>, J<sup>4</sup>, carried on the cylinder and arranged to contact with the stops A<sup>5</sup>, A<sup>6</sup>, on the casing to determine the extreme positions to which the  
5 cylinder may be turned, all arranged to serve substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

LOUIS SCHNEIDER, SENIOR.

Witnesses:

F. H. McCORMICK,  
EMMA HARRIS.