

(No Model.)

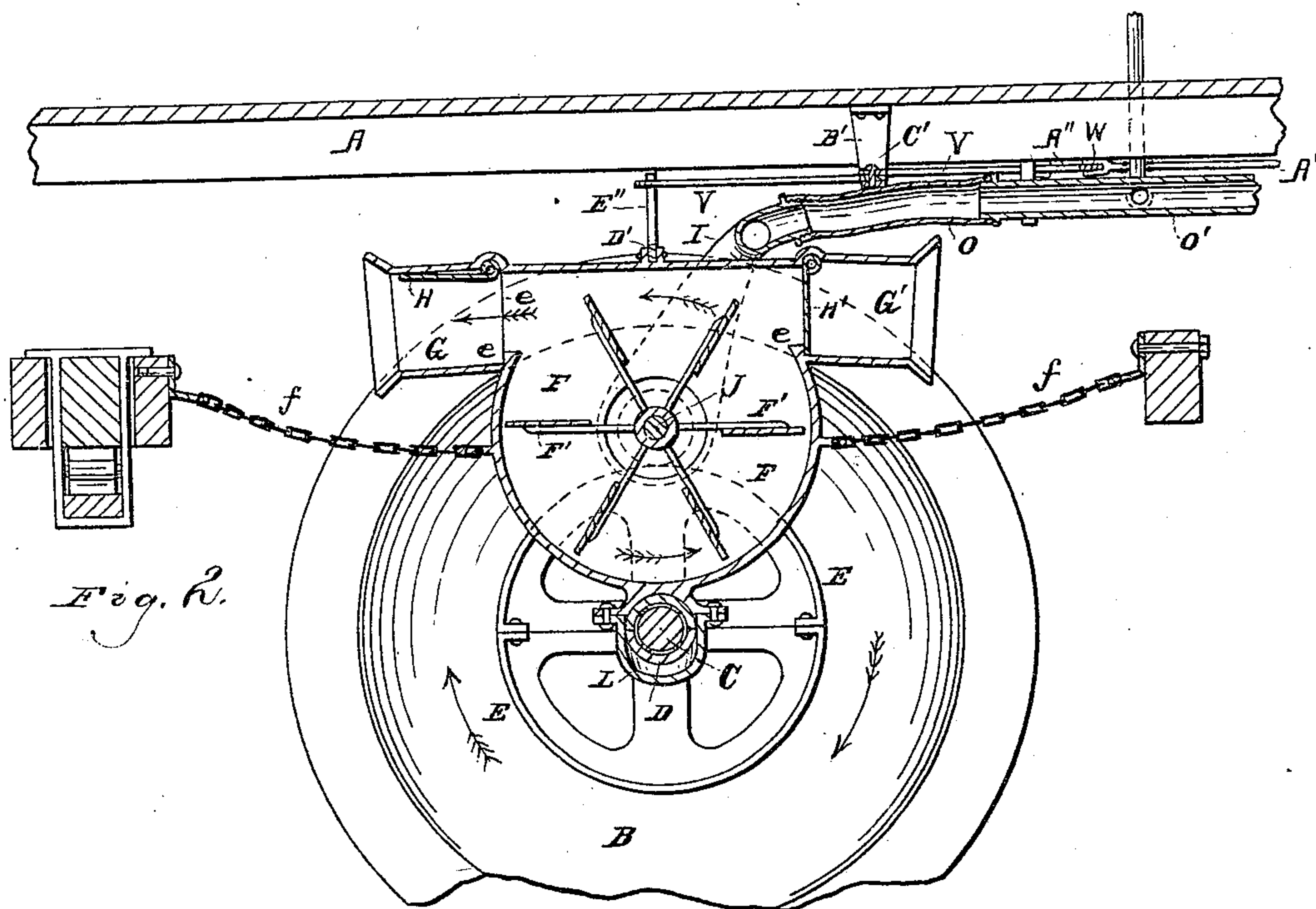
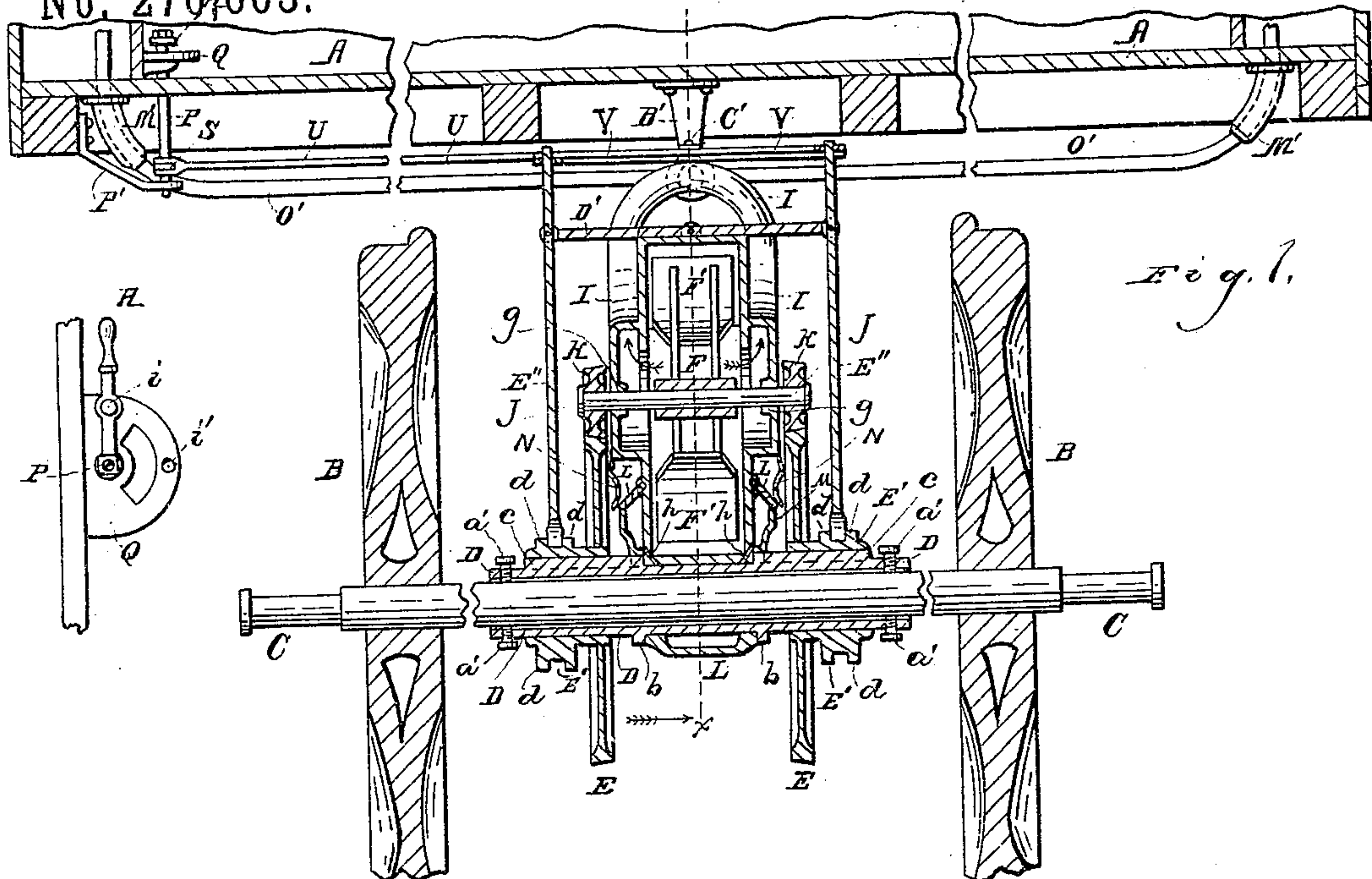
2 Sheets—Sheet 1.

E. H. MOTT.

RAILWAY CAR VENTILATOR.

No. 270,603.

Patented Jan. 16, 1883.



Witnesses
Henry Frankfort,
W. B. Halpern.

Inventor,
Edward H. Mott.
per, F. F. Warner
his Attorney.

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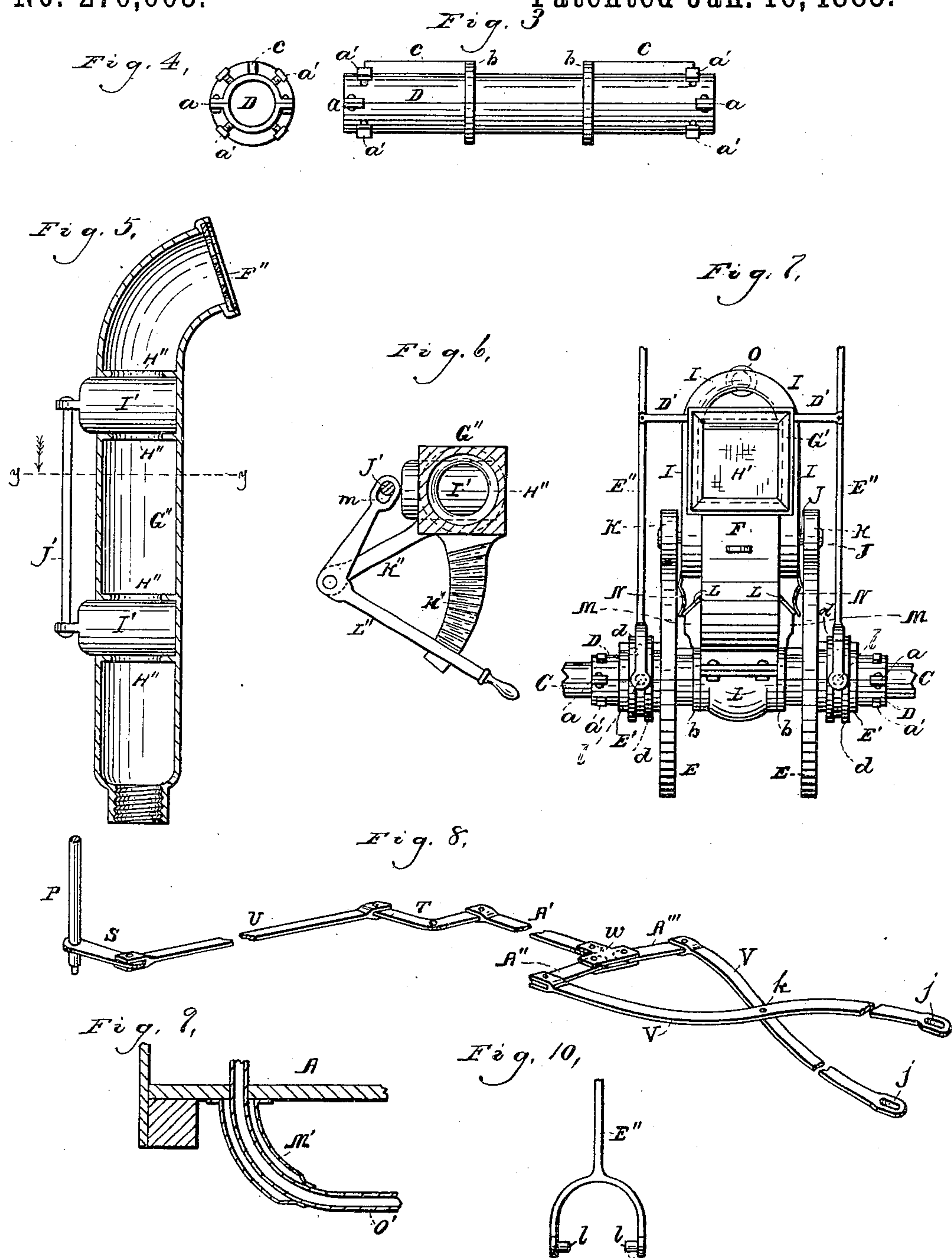
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UNITED STATES PATENT OFFICE.

EDWARD H. MOTT, OF CHICAGO, ILLINOIS.

RAILWAY-CAR VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 270,603, dated January 16, 1883.

Application filed May 15, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. MOTT, of Chicago, in the county of Cook and State of Illinois, a citizen of the United States, have
5 invented certain new and useful Improvements in Railway-Car Ventilation, of which the following, in connection with the accompanying drawings, is a specification.

In the drawings, Figure 1, Sheet 1, is a vertical central cross-section of a railway-car ventilating apparatus embodying my invention, also showing a detail of the regulating or shifting lever and its locking-bracket. Fig. 2, Sheet 1, is a section in the plane of the line *x*
10 *x* of Fig. 1. Fig. 3, Sheet 2, is a side elevation of the thimble or false axle. Fig. 4, Sheet 2, is an end view of the said thimble. Fig. 5, Sheet 2, is a vertical central section of the register-box and its valves. Fig. 6, Sheet 2, is a
15 section in the plane of the line *y y* of Fig. 5, showing also the serrated arm and valve-setting lever. Fig. 7, Sheet 2, is an end elevation of the fan-chamber and the fan-driving mechanism. Fig. 8, Sheet 2, is a perspective
20 representation of a portion of the shifting mechanism. Fig. 9, Sheet 2, is a vertical central section, showing the form and location of the suction-tube shield or jacket; and Fig. 10, Sheet 2, is a detail of one of the forked shifting-
25 levers.

Like letters of reference indicate like parts.

A reference to Letters Patent of the United States No. 254,148, dated February 28, 1882, and issued to me for the improvements therein
35 set forth, will aid others to understand the nature of this invention, my purpose now being to improve, in the several respects hereinafter set forth as new, the construction and operation of ventilators of the class referred to in the said Letters Patent.

A represents the floor of a railway-car.

B B are the car-wheels, and C is a car-wheel axle.

D is a thimble or false axle on the axle C.
45 I make the thimble D somewhat larger than the axle C and in two parts or horizontal sections, provided with ears *a a*, which are bolted together, as indicated in Figs. 3 and 7. I apply this thimble to the axle C by means of set-
50 screws *a' a'*, passing through the thimble and resting against the axle. By this means the thimble D is secured rigidly to the axle or so

as to be rotated therewith, and may be centered, so as to prevent wabbling.

b b are annular ribs, shoulders, or collars
55 on the thimble D, and *c c* are longitudinal ribs or keys thereon.

E E are wheels, and E' E' are their hubs. These wheels are mounted on the thimble D, and their hubs are interiorly grooved to receive the ribs *c c*. In other words, these wheels
60 are splined to the thimble D, or are rotated with it, but capable of being moved laterally thereon. The perimeters of the said wheels are also slightly beveled, as is clearly indicated
65 in Fig. 1. On the hubs E' E' are the parallel annular ribs or collars *d d*.

F is a fan-chamber, and F' is a rotary fan therein. The wall of this chamber is seated on the thimble D and located between the collars
70 *b b*. This fan-chamber has two ports, G and G', in which are hung doors or valves H and H', respectively. These doors swing in opposite directions and open toward the mouths of the ports. They rest, when closed, against
75 jambs or shoulders *e e*. To prevent the chamber F from rocking on its seat, it may be connected to the car or truck by means of light chains or guys *f f*, as indicated in Fig. 2; but its connection with other parts of the apparatus
80 will also tend to prevent such a rocking movement, as will hereinafter be perceived.

I is a forked tube or duct, entering the chamber F on each side of its center, as shown, and operating similarly to the like tube shown and
85 described in the Letters Patent hereinbefore referred to. This tube or duct and the wall of the chamber F and its port extensions and its seat may all be cast in one and the same piece, but may be made in separate parts, if deemed
90 best.

J is the fan-axle, to which the fan is rigidly attached. This axle passes through the center of the fan-chamber and out through the tube or duct I, which is made sufficiently thick
95 to form a suitable bearing for the said axle, as indicated at *g g*, Fig. 1. On the outer ends of the axle J are small wheels or pinions K K, rigidly attached thereto, and arranged for contact with the wheels E E. The wheels K K
100 are beveled to correspond to the bevel of the wheels E E.

L is a lubricating-box, which is pendent from the seat of the fan-case, being removably

connected thereto by means of bolts and nuts. The box L, as shown, is located between the ribs or collars *b b*, and dishes down a little way below the thimble D to hold a suitable quantity of waste and oil.

L' L' are lids or doors covering small chambers, M M, outside of the fan-chamber, and *h h* are openings or channels passing from the chambers M M to that part of the thimble D which is between the shoulders *b b*, as indicated in Fig. 1.

N N are springs resting on the doors L' L'. These springs are so bent or formed that the doors will be held closed by them; but the springs will yield to admit of the opening of the doors, and when opened the doors will also be held in their open position by the springs, which will yield, however, to admit of the doors being closed. Oil for lubricating purposes is poured into the chambers M M, from whence it will pass through the channels *h h* to the thimble D, and thence to the waste in the box L, thus lubricating the parts and preventing too great friction between the fan-chamber and its seat.

O is a flexible tube, connecting the forked flue I to the air pipes or ducts entering the car, and O' O' are such ducts.

It will be perceived that the operation of the parts thus far described will be as follows: When the car is in motion the wheels B B will of course be rotated. Suppose, for example, that the train is being drawn in such a direction that the wheels B B will be rotated in the direction indicated by the arrow shown thereon in Fig. 2. The wheels B B, being rigid on the axle C, will rotate it, and the thimble D, being secured to the said axle, will be rotated therewith. As the wheels E E are splined or keyed to the thimble D, they also will be rotated therewith, and if they be set to engage the wheels K K the latter will also be rotated, thus causing a rotation of the axle J and the fan. In Fig. 2 the arrows shown near the fan indicate the direction of its rotation when the wheels B B are rolling in the direction there indicated. A current of air will then be forced out through the port G, the door H being thus held up or open, as shown, while the door H' will be held closed by the suction thus produced behind it, and the direction in which the car will then move will also tend to keep the door H' closed or against its seat or jamb *e*. Air will thus be sucked into the fan-chamber to take the place of that expelled, and as the air-ducts entering the fan-chamber communicate through the pipes or ducts O and O' with the interior of the car the air will be drawn out of the car. Other air will enter through the doors, windows, or ventilator-openings in the car, and the car will thus be thoroughly ventilated. By driving the small wheels or pinions K K on the fan-axle by means of the larger wheels or drivers, E E, on the car-wheel axle, I am able to produce more frequent rotations of the fan during one rota-

tion of the car-wheels than if the fan were mounted directly on the car-wheel axle, and consequently, there being a greater speed in the movement of the fan, it performs its work with better results; also, by locating the ports G and G' in the upper part of the fan-chamber the air is expelled in the opposite direction from that in which the car moves. The oil poured into the chambers M M will lubricate the parts in the manner described. To stop the movement of the fan, move the wheels E E laterally away from contact with the wheels K K.

I will now describe the means I employ for shifting the wheels E E into and out of engagement with the wheels K K.

P is a vertical rod, the lower end of which is pivoted on a bracket, P', attached to the under part of the car.

Q is a bracket applied to the inside of the car, and arranged a little way above the floor. In the bracket Q are two holes, *i i'*, and R is an arm on the upper end of the rod P. This arm has in it a hole located to register with the holes *i i'* when the rod P is turned sufficiently in either direction. By placing a headed pin in the hole in the arm R, when that hole registers with one of the holes in the bracket Q the arm will be locked temporarily, but may be shifted from the hole *i* to the hole *i'*.

S is an arm near the lower end of the rod P.

T is a bell-crank turning on a bracket depending from the under side of the car, and U is an arm or link connecting the arm S to one arm of the crank T, the arm U being pivoted to the parts which it connects.

V V are intersecting bent arms or levers, pivoted to each other between their ends.

W is a T-shaped block, to which are pivoted the arms or links A', A'', and A'''. The arm A' is also pivoted to one arm of the bell-crank T, and the arms A'' and A''' are pivoted to the arms or levers V V, all of which is clearly indicated in Fig. 8. In the free ends of the arms V V are the slots *j j*.

It will be perceived, on reference to Fig. 8, that if the rod P be turned on its axis the slotted ends of the arms V V will be either separated or drawn together, according to the direction in which the said rod is turned, it being understood that the pin is fixed or stationary, which serves to connect the arms V V pivotally between their ends. For example, B' is a bracket depending from the under side of the car, and C' is a pin passing vertically through it and through the arms V V, between their ends or at their intersection, as at the point *k*.

I have not attempted to show the bracket to which the crank T is pivoted, as the parts shown in Fig. 8 may be applied to the car in any suitable way which will permit them to be operated substantially in the manner now described and hereinafter further explained.

D' is a cross-bar attached to the top of the fan-chamber, and E'' E'' are vertical levers

pivoted between their ends to the ends of the bar D". The upper ends of the levers E" E" enter the slots j j in the arms V V, and their lower ends are forked and straddle the hubs E' E'. These forked ends are shown in detail in Fig. 10; and l l are pins or studs extending therefrom into the groove formed by the shoulders d d on the said hubs. It will now be perceived that the levers E" E" will be vibrated when the slotted ends of the arms V V are moved in the manner described, and that vibration will cause the wheels E E to slide upon the thimble D and either engage or disengage the wheels K K, as may be desired; and this shifting mechanism will be locked in position, as before stated, by means of a pin passed through the lever or arm R into the hole i or i', as the case may be, according to whether the wheels E E are to be held in or out of engagement with the wheels K K. I deem it best to drive the wheels K K by mere frictional engagement with the wheels E E, and I have therefore shown all these wheels as having beveled peripheries, as indicated in Fig. 1, so that engagement and disengagement may be effected with facility.

F" is a register, and G" is a chamber below it. H" H" are horizontal annular ribs in the chamber G", and I' I' are sliding valves arranged between the said ribs. J' is a rod connecting the said valves. K' is a serrated arm projecting from the part G", and L' is a bent lever pivoted to an arm, K", also extending from the part G". The rod J' passes through a slot, m, in the end of the short arm of the lever L', as shown in Fig. 6. By moving the handle of the lever K', the valves I' I' may be drawn to a greater or less extent out from the part G", thus permitting a greater or less amount of air being drawn out of the car. An air-space is also thus formed between the valves, and frost and cold air is thus prevented from following up the air-ducts and entering the car in cold weather and when the ventilator apparatus is not in use.

M' is a sheet-iron jacket surrounding the pipes O' O' where they enter the car. This jacket is flanged at its upper end for attachment to the under side of the car-floor. It is also much larger in diameter than the tube or duct it surrounds, as indicated in Fig. 9, and is drawn in at its lower end to fit upon the said tube. An air-chamber is thus made between the jacket M' and the pipe O', below the bottom of the car, which air-chamber will tend to prevent frost from following up the pipe O'.

I do not here intend to restrict myself to friction-gear for driving the fan, as the wheels E E and K K may be cogged or belted, if deemed best. Neither do I here intend to restrict myself to the fan-chamber when seated on the false axle or thimble D, which is substantially an axle employed only for a subordinate or minor purpose; and it is obvious that the fan-chamber may be seated directly on the axle, although I deem it preferable to employ

the false axle for the purpose set forth. It is obvious, also, that only one wheel E need be used in connection with one wheel K arranged to engage it.

It will be observed that the doors H and H' are hung some way inside of the mouths of the ports G and G', and when closed extend entirely across the passages in which they are hung, thus wholly closing the ports alternately, and preventing the entrance of any air into that side of the fan-chamber. The projecting ends of the ports serve as hoods, which collect the air, and thus serve or aid in keeping either one or the other of the said doors closed at the proper time.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, substantially as specified, in a railway-car ventilating apparatus, of a fan-chamber seated on the thimble or false axle D, mounted on the car-wheel axle, the wheels E E, (one or more,) driven by the said false axle, and one or more wheels, K K, mounted on the fan-axle and arranged for engagement with the wheel or wheels E E, for the purposes specified.

2. The combination, substantially as specified, in a railway-car ventilating apparatus, of a fan mounted on an axle projecting through the side walls of the fan-chamber, one or more wheels, K K, mounted on the fan-axle and located thereon outside of the said walls, and one or more sliding and rotary drive-wheels, E E, arranged to engage the wheels K K, in connection with means for shifting the wheel or wheels E E laterally, for the purposes set forth.

3. The combination, substantially as specified, in a railway-car ventilating apparatus, of the false axle or thimble D, mounted on a car-wheel axle smaller than the bore of said thimble, the screws a' a', the fan-chamber F, seated on the false axle or thimble D, the wheels E E, (one or more,) splined to the axle or thimble D, and one or more wheels, K K, mounted on the fan-axle, in connection with means for adjusting or shifting the splined wheels laterally, for the purposes set forth.

4. The combination, substantially as specified, in a railway-car ventilating apparatus, of the fan-chamber F, an oil-box, L M, having therein the oil-ducts h h, and a driving-axle passing through the said box and supporting the said chamber, for the purposes set forth.

5. The combination, substantially as specified, in a railway-car ventilator, of a fan-chamber having two oppositely-arranged discharging passages or ports, G and G', therein, and an outwardly-swinging door hung in each of the said ports or passages, some way back from the outer ends thereof, and wholly closing the said passages when the said doors are closed, the outer ends of the said passages or ports forming hoods about the said doors, substantially as and for the purposes specified.

6. The combination, in a car ventilating apparatus, of the fan-chamber F and the chains or guys *f f*, connected to the said chamber and to the truck-frame, substantially as and for the purposes specified.

7. The combination, in a railway-car ventilator, of a fan confined in a chamber and mounted on a fan-axle projecting from the said chamber, and carrying one or more wheels, *K K*, one or more laterally-sliding wheels, *E E*, for driving the wheel or wheels *K K*, and having grooved hubs, and one or more vibrating forked levers, *E'' E''*, having in their forked ends pins or projections *l l*, entering the groove in the said hub or hubs, in connection with levers and connecting-rods for vibrating the levers *E'' E''*, for the purposes set forth.

8. The combination, in connection with a railway-car ventilator, wherein a fan is driven by means of wheels splined to a driving-shaft, of the vibrating levers *E'' E''*, the pivoted levers *V V*, the bell-crank *T*, the rotary rod *P* and its arm *S*, the connecting-arms *U*, *A'*, and *A'' A'''*, and the block *W*, substantially as and for the purposes specified.

9. The combination of the ventilating register or opening *F''*, the chamber *G''*, and two valves located in the said chamber, and between which is an air-space, substantially as and for the purposes specified.

10. The combination of the ventilating register or opening *F''*, the chamber *G''*, the two valves *I' I'*, the connecting-rod *J'*, the serrated arm *K'*, and the bent lever *L''* and its supporting-arm, substantially as and for the purposes specified.

11. The combination of the bent arms *V V*, having therein the slots *j j*, and pivoted to each other between their ends, the connecting-arms *A''* and *A'''*, pivoted to the arms *V V*, a pivoted connecting-arm for actuating the arms *V V*, and vibrating levers entering the said slots, substantially as and for the purposes specified.

EDWARD H. MOTT.

Witnesses:

F. F. WARNER,
H. FRANKFURTER.