(No Model.) 2 Sheets—Sheet 1.

F. B. MALLORY.

CAR VENTILATOR.

No. 420,541. Patented Feb. 4, 1890.

Fig 2.

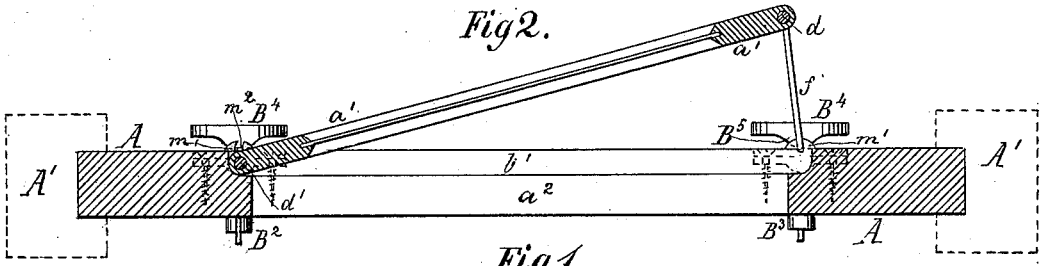
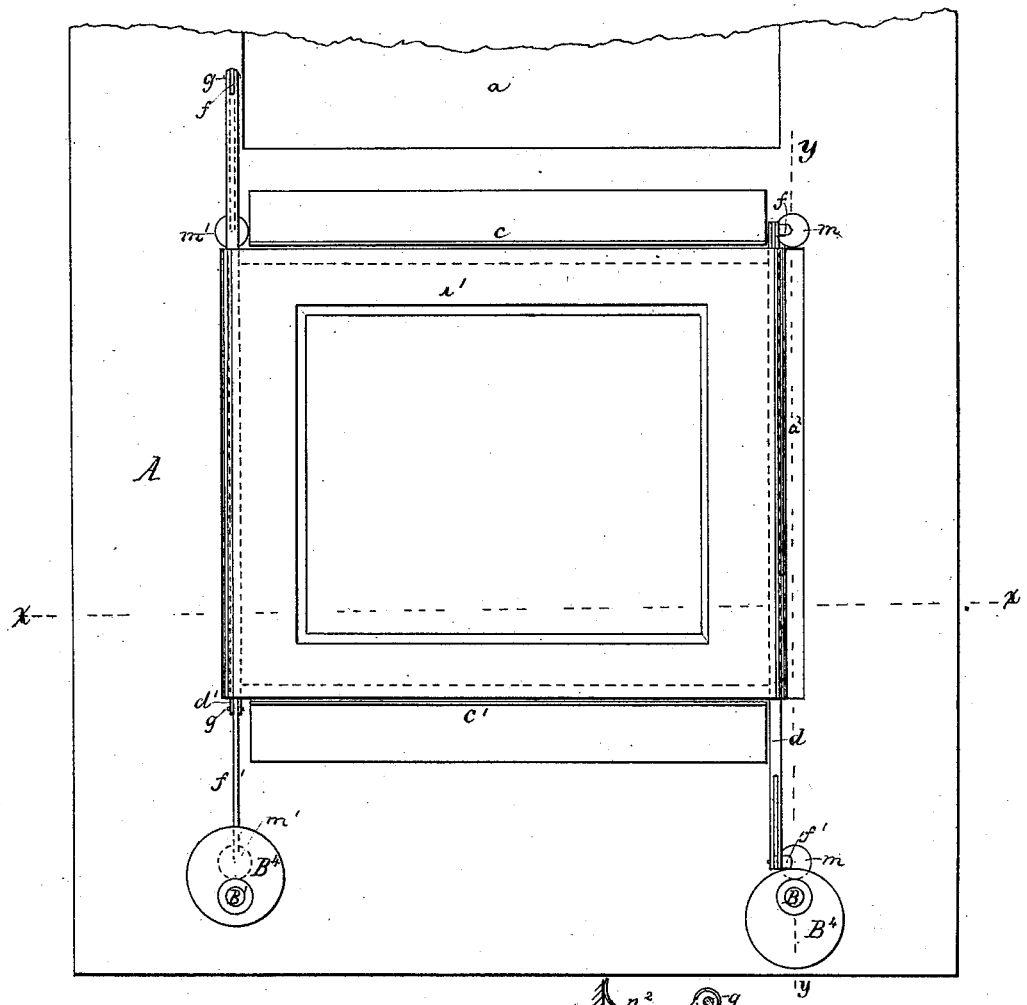


Fig 1.



Witnesses:
J. P. Theo Lang
Edward S. Hunick

Fig 5.

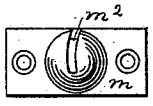


Fig 4.

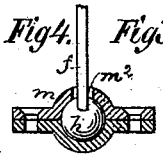
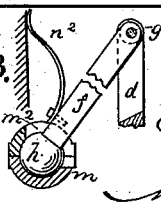


Fig 3.



Inventor:
Frank B. Mallory
by his attys
Mason, Hunick & Lawrence

(No Model.) 2 Sheets—Sheet 2.

F. B. MALLORY.

CAR VENTILATOR.

No. 420,541. Patented Feb. 4, 1890.

Fig6.

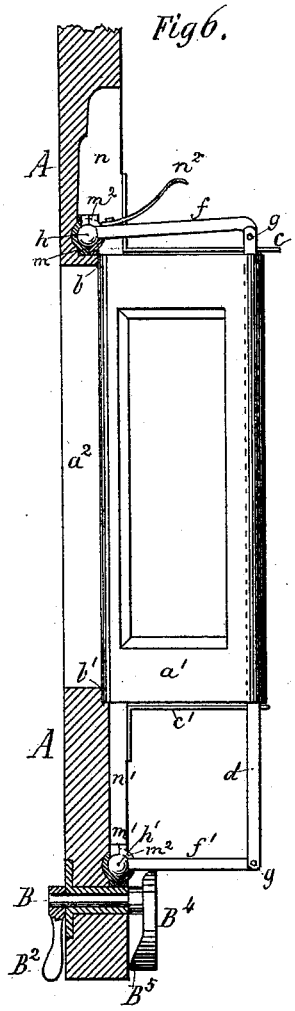


Fig7.

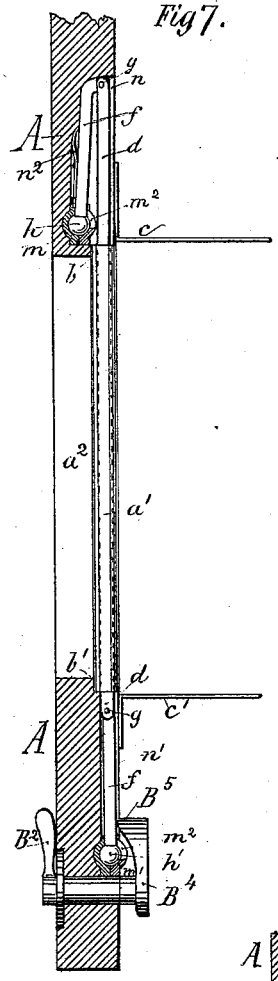


Fig8.

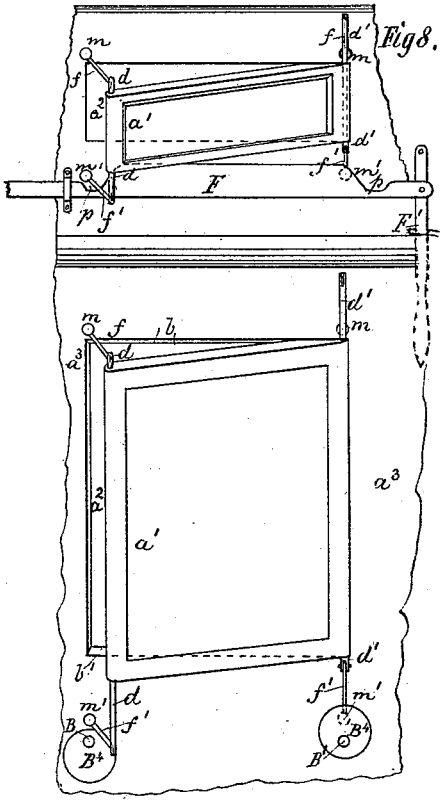


Fig9.

Fig17.

Fig10.

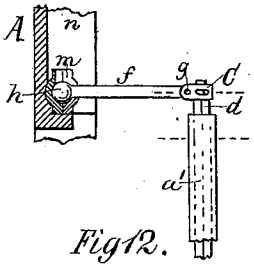


Fig12.

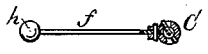


Fig11.

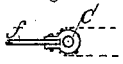
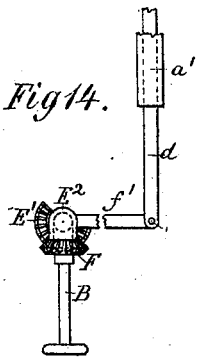


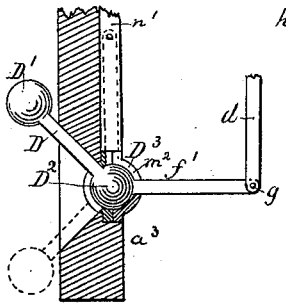
Fig15.

Fig16.

Fig13.

Fig14.





Witnesses:
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Edward P. Fennick

Inventor:
Frank B. Mallory
by his attys
Mason, Fennick and Lawrence

UNITED STATES PATENT OFFICE.

FRANK B. MALLORY, OF FLEMINGTON, NEW JERSEY.

CAR-VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 420,541, dated February 4, 1890.

Application filed October 24, 1889. Serial No. 328,036. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. MALLORY, a citizen of the United States, residing at Flemington, in the county of Hunterdon and State of New Jersey, have invented certain new and useful Improvements in Railroad-Car Ventilators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in a novel ventilator window-sash for railroad-cars, said sash being either sliding or non-sliding, and both of its edges hung on vertically-sliding hinging-rods connected at top and bottom with thrust and pull connections and suitable actuating devices, whereby the sash at one or both of its side edges can be swung out at an angle to the side of the car, and thus made to cover a portion of the sash-recess and form a ventilation-opening suited to the direction in which the car may be moving.

By my invention the sash, while always maintaining its horizontal position, can be permanently connected to its hinging and adjusting devices, and should inexperienced persons or passengers inadvertently operate the adjusting devices and hinging-rods on both sides of the car at the same time there would be no liability of the sash becoming disconnected from the car and dropping from its supports.

My invention also consists in certain novel constructions, combinations, and arrangements of parts, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an outside elevation of my ventilator window-sash partly swung open. Fig. 2 is a horizontal section in the line $x\,x$ of Fig. 1. Fig. 3 is a detail view of one of the operating-arms, its ball, socket-bearing, and a starting-spring, the socket for the ball being shown in section. Fig. 4 is a sectional view of the socket of said ball-and-socket bearing, and an elevation of the ball and connection-bar standing at a right angle to Fig. 3. Fig. 5 is a top view of the ball-and-socket bearing. Fig. 6 is a vertical section in the line $y\,y$ of Fig. 1. Fig. 7 is a section in the same line, showing the ventilator window-sash closed. Fig. 8 is a view of a portion of a car-wall, showing a lower ventilator-sash and an overhead ventilator, the latter operated by a mechanism specially adapted thereto, and said mechanism being arranged outside on top of the car and operated by a lever extended down through a slot in the top of the car, either into the car or above its platform. In this view the handle portion of the lever within the car is shown by dotted lines. Figs. 9, 10, 11, and 12 are views of a slightly-changed form of mechanism for hanging and operating the ventilator window-sash. Fig. 13 is a view showing another slightly-different construction of operating mechanism, and Fig. 14 is a view of a construction wherein a bevel-wheel and sector are used to move the operating mechanism. Figs. 15, 16, and 17 illustrate how the rods of the ventilator may be confined in semi-tubes and complete tubes, and fastened by continuous semi-tubular and by spaced semicircular flanged straps.

A in Figs. 1, 2, 6, and 7 of the drawings represents a vertically-sliding sash fitted in the side uprights A′ (shown in Fig. 2 by dotted lines) of a car-window frame. This sash may consist of a stationary glazed upper portion a and a swinging glazed ventilating portion a', as in Figs. 1, 6, and 7; or it may consist simply of a glazed swinging ventilating-sash a', applied either to a sliding sash-frame A or to the stationary car-wall a^3, as in Figs. 8 and 13, and it may be applied both in the body side walls and top or deck side walls of a car, as illustrated in Fig. 8, or only in the side walls, accordingly as may be required by the different styles of construction of cars of a railroad.

The preferable construction for cars already in use is the one shown in Figs. 1, 2, 6, and 7, while for new cars the plan shown in Figs. 8 and 13 is to be preferred. The ventilating-sashes for the side walls of the top or deck of the car will not be hinged in auxiliary sliding sash-frames, while those for the side walls of the car will be constructed upon such frames whenever desirable. So far as the sliding of the sash is concerned, any of the known modes of providing for such movement may be adopted, and the same is not claimed as a novelty.

By referring to the drawings, Figs. 1, 2, 6,

and 7, it will be seen that the ventilating-sash a' is placed opposite the opening a^2 in the sliding sash-frame A, or in the stationary side walls a^3 of the car-body, as in Figs. 8 and 13, and kept in that position so far as any vertical movement is concerned by means of rabbeted shoulders at b b' of either the sliding sash or car-body side walls, and, if found necessary, it may be further kept in position by angular ledge-plates c c', applied above and beneath, said plates being fastened to the outside of the car, as shown in Figs. 1, 6, and 7. The lower plate, if employed, will prevent the ventilating-sash from sagging down in the event of its getting bodily off the rabbeted shoulders, which might occur should both edges of the sash be inadvertently moved outward for the purpose of uncovering the opening a^2 for purposes of ventilation by inexperienced persons or passengers. Along the edges of the sash round hinging-rods d d' are fitted to slide vertically, said rods being passed down through holes bored through the sash, as shown by horizontal section in Fig. 2, and by side elevation in dotted lines in Figs. 1, 6, and 7. These rods are longer than the sash, and to their upper and lower ends outwardly-thrusting and inwardly-pulling connection devices f f' are pivoted, as at g. Said connection devices may consist of slightly-inclined bars with balls h h' on their lower ends, which balls are fitted in ball-sockets m m', fastened to the sliding sash or stationary frame-work of the car.

The bars are allowed to swing outward, downward, and upward on their balls in the sockets by means of slots m^2, formed in the plates which form the ball-sockets m m', as illustrated in Figs. 2, 3, 4, 5, 6, and 7. Recesses n n' are provided in the sash or car-walls for the reception of the bars and ends of the rods when the sash is closed, as in Fig. 7.

On the upper connection devices f a spring n^2 may be attached, as shown, for starting them in their outward thrusting or downward swinging movement, and the recesses n may be deepened for the reception of these springs, as shown in Figs. 6 and 7. It will be seen that when it is desirable to set the sash at an angle to the side of the car, as in Fig. 2, or at a reverse angle, as in Fig. 8, accordingly as the car is moving, for the purpose of partially uncovering the opening a^2 and thereby ventilating the car, it can be readily effected by freeing it at either edge and allowing the spring or the gravity of the rod and connection on one side to thrust or force the sash outward at one or the other edge from the position shown in Fig. 7 to either of the positions shown in Figs. 1, 2, 6, and 8. For holding the sash in its closed position (shown in Fig. 7) vibrating shafts B B′, having handles B^2 B^3 on their inner ends and circular cams B^4 on their outer ends, may be provided, as shown in Figs. 1, 2, 6, and 7, and also shown on the lower ventilation-sash in Fig. 8. These shafts are passed through the wall of the car, and their handles are on the inside for convenient use of the passengers, while their cams occupy positions outside the car and support the lower connection devices f' in horizontal position when the sash is open for ventilation of the car, as illustrated in the drawings. The cams are respectively formed with a lateral projection B^5, which may abut against the car-body and act as a stay when the sash is open, and presses laterally against the said lower connection device and holds the rod and connection device in the position shown in Fig. 7 when the sash is closed. By turning one or the other of the shafts B B′ so as to turn one or the other of the cams B^4 to the position shown in Fig. 6 and on body portion of the car in Fig. 8 the bars will, by their gravity, assisted by the impetus of the spring n^2, (if used,) swing outward and downward, and thereby thrust or cause the sash to swing outward horizontally at one of its edges, one or the other of the rods sliding downward through the sash in accordance with the horizontal position assumed by the connecting devices, and the sash at one or the other of its edges swinging off away from the car and partially uncovering the opening a^2, as illustrated in Figs. 1, 2, 6, and 8. If the car is moving toward a depot, the sash may stand in the position shown in Fig. 2, and if moving away from the same may be reversed, as shown in Fig. 8.

In practice the rods may be fitted in half cylindrical metal-covered recesses in the edges of the sash and confined by semi-tubular flanged strips of metal, as shown in Fig. 15, or they may be secured by semicircular spaced straps, as shown in Fig. 16; or metal tubes may be strapped to the edges of the sash and the rods turn and slide in the tubes, as shown in Fig. 17.

The ball-and-socket joints of the swinging connections allow these connections to accommodate themselves universally to the necessary deflections which occur in the opening and closing of the ventilation-sash at either of its edges.

Instead of having the rods d d' round, they may be made square, and swivel or loose pivotal connections C, as illustrated in Figs. 9, 10, 11, and 12, may be adopted; but it is preferable to use round rods. The cams might also be dispensed with, and a handle D, with a knob D′ on its end, might be connected directly to a ball D^2, fitted in a ball-socket D^3, and a lower connecting device f' be extended directly from the ball D′, as shown in Fig. 13. With this construction by lifting the handle the sash can be opened and by lowering it closed. The opening or closing of the sash might also be effected by means of a bevel-wheel E on the shaft B gearing with the sector E′ on the lower connection device f', such device having a ball-and-socket connection E^2, as shown in Fig. 14.

In Fig. 8, on the top or deck of the car is

shown connected a longitudinally-sliding bar F, having spaced cam-like depressions *p* in its upper edge, these parts being arranged outside the car and the hand-lever F′ being connected by its upper end to the bar, the handle end of said lever extending through a slot in the top of the car down into the car or above the platform, as illustrated in dotted lines. In this view the connection devices *f f′* are represented as resting on the bar. With this construction by sliding the bar longitudinally with the hand-lever F′ the bars *f′* by entering the depressions will cause the sash to be opened at either edge, as occasion requires. The bar F with notches *p* is intended for operating a series of ventilators in one side wall simultaneously, it serving for both opening and closing the same accordingly as it is moved. It is, however, contemplated to operate the top or deck ventilators either separately or unitedly, and if operated separately a device similar to that shown in Fig. 14 may be adopted.

What I claim as my invention is—

1. The combination, with a car-window casing or sash-frame thereof, of a horizontally-moving ventilating-sash having a vertically-sliding rod attached to its edge, a thrust and pull connection, and suitable means for actuating the rod for adjusting the sash at an angle to the car, substantially as described.

2. The combination, with a car-window case or sash-frame thereof, of a horizontally-moving ventilating-sash having vertically-sliding rods, one at each side edge of the sash, thrust and pull connections, and suitable means for actuating the rods for adjusting the sash to an angle with the car either on the right or left hand side of the sash-opening, substantially as described.

3. The combination, with a car-window casing or sash thereof and a ventilating-sash, of the cam, vertically-sliding rod, and thrust and pull connections, the said cam having a circumferential gradually-extended vertically-lifting surface and also a laterally-extended horizontally-pressing surface, substantially as described.

4. In car-ventilating sash-fixtures, the vertical sliding rods connected to the edges of the ventilating-sash and suitable jointed connections of a car-window casing or sash-frame thereof, substantially as described.

5. In car-ventilator sash-fixtures, the bar pivoted to the sliding rod of the ventilating-sash and connected to the car by a ball on its end, and metallic bearing-plates, which, with the ball, form a slotted ball-joint connection, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

FRANK B. MALLORY.

Witnesses:

J. P. THEODORE LANG,

EDWARD T. FENWICK.