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VENTILATOR FOR CARS

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Fig. 1.

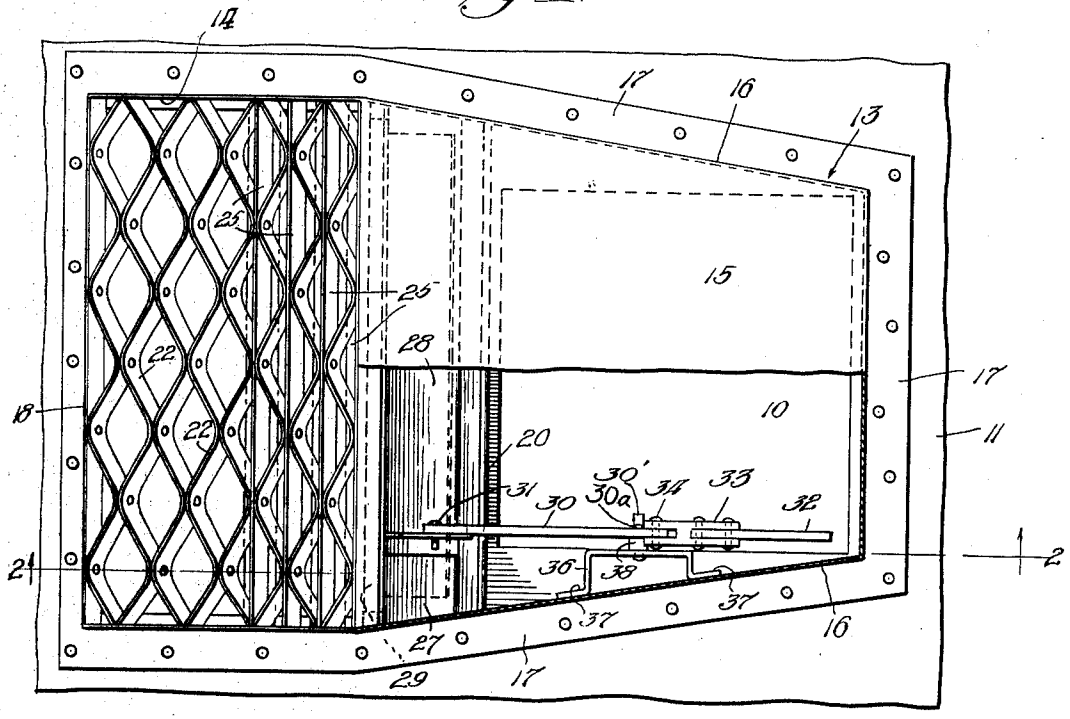
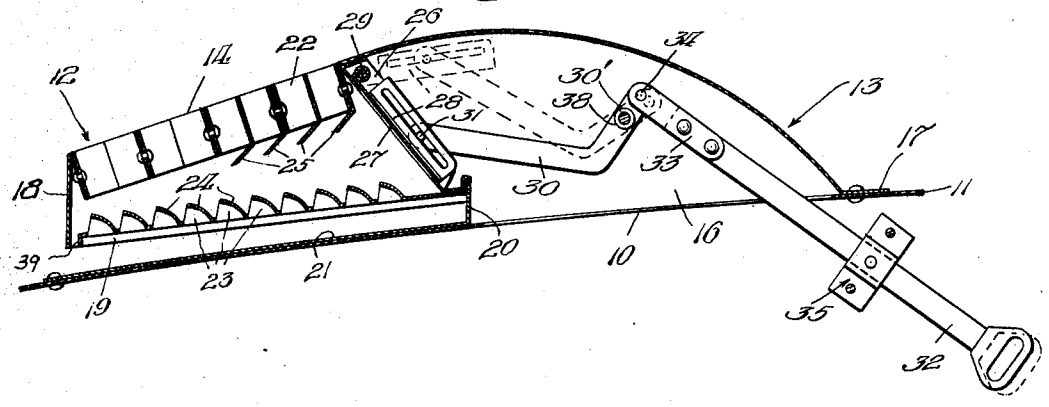


Fig. 2.



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VENTILATOR FOR CARS

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3 Claims. (Cl. 98—20)

This invention relates to ventilators, and it has to do more particularly with the type of ventilator adapted to be mounted on the top of a street or railway car and to operate by the aspirating effect of the movement of the car through the atmosphere to draw air from the interior of the car so that it may be replaced by fresh air.

One of the objects of the invention is to provide an improved ventilator of the foregoing character which is of simple and inexpensive construction, which is strong and durable and which may be easily and quickly adjusted from the interior of the car.

Another object is to provide a highly efficient ventilator which projects from the car roof or other supporting surface a minimum extent whereby the overall height of the car is decreased and the appearance of a ventilator-equipped car is enhanced.

A further object is to provide, when the car is at rest or in motion, for the positive regulation of the ventilation of the interior of the car without dirt, etc., getting into the car through the ventilator, the arrangement being such that dirt is deflected away from the car ventilating opening and it is not permitted to collect within the ventilator.

Other objects and advantages will become apparent as this description progresses and by reference to the drawing wherein:

Figure 1 is a top plan view, partially in section, of one form of ventilator embodying the invention; and

Fig. 2 is a section taken substantially on line 2—2 of Fig. 1.

Referring to the drawing, the ventilator is adapted to be mounted over a ventilating opening 10 in the roof 11 of a car. The ventilator casing is formed, preferably, of sheet metal and it is of an elbow-like shape having a horizontal portion 12 disposed substantially parallel with respect to the car roof, and a vertically-directed portion 13 which is connected to the car roof over the ventilating opening 10.

Specifically, the ventilating casing is provided with a top wall having a horizontal open part 14 and a downwardly curved closed part 15. The horizontal casing portion 12 is of rectangular-like shape having plane and imperforate end walls 16 (only one of which is shown) and outer side wall 18. The horizontal casing portion 12 is further provided with a bottom wall 19 which is secured at its inward edge to a vertical neck wall 20 which is, in turn, secured to the car roof 11 by a flange 21. The end and top casing walls 14 and 16 are attached to the car roof by flanges 17 and the arrangement of the casing parts is such that the bottom wall 19 of the horizontal casing portion 12 is spaced from the car roof as clearly shown in Fig. 2.

The open top wall 14 of the casing is provided with honeycomb partitions 22 (Fig. 1) which are securely fastened together to form a grating. The outer edges of the partitions 22 are substantially flush with the top wall 14 and, when the car is in motion, they form aspirating edges, the motion of which through the atmosphere exerts a suction on the air inside the ventilator, as will be well understood.

The bottom wall 19 is provided with a plurality of openings 23 which are, preferably, formed by slitting the bottom wall and shaping the material at the rear of each slit to provide upstanding fins or deflectors 24 at the inner edges of each opening which are inclined toward the outer side wall 18. In this manner, an additional aspirating effect is provided for, in addition to deflection effect, which will be referred to further hereinafter.

Communication between the horizontal and vertical casing portions 12 and 13 is controlled by a valve structure similar to that disclosed in our co-pending application Serial No. 500,732. More particularly, the inner wall of the casing adjacent the vertical neck wall 20 is bounded by a strengthening member of L-shape in cross section having one web 26 thereof secured to the casing wall and another and right-angled web 27 serving as a valve seat for a flap-type valve 28. The upper edge of the valve 28 is pivotally supported by a cross rod 29. The valve and its seat 27 are inclined toward the outer side wall 18 and the valve swings toward the horizontal portion 12 and the wall 18 to engage its seat 27 so that the suction action set up by the aspirating means in the top and bottom walls 14, 19 will always tend to close the valve.

The valve 28 is operated by connections leading into the interior of the car, which connections are similar to those shown and described in our said co-pending application. Specifically, one of the arms of a crank 30 is pivotally connected by a pin 30′ to the casing end wall 16 and its other arm is connected to the valve 28 by a slot-and-pin connection 31. An operating arm 32, which extends through the ventilating opening 10 within the car, is provided with a bifurcate extension 33 which is pivotally connected, as at 34, to the crank 30. The operating arm 32 is slidably supported by a tensioned friction device 35 similarly to the structure of our said co-pending application. With such structure, the operating arm 32 may be moved to open the valve to any desired extent and the friction device 35 acting on the operating arm 32 will hold it in any position to which it is adjusted. A cotter pin 30ª, or the like, is employed to prevent detachment of the arm 30 from the pin 30′.

The pivotal support for the valve operating crank 30 takes the form of a U-shaped member

36 having feet 37 welded, or otherwise secured, to the casing end wall 16. The member 36 supports the pin 30', a washer 38 being mounted on the pin 30' between the member 36 and the arm 30 for proper spacing of the latter.

The top wall of the horizontal portion adjacent the valve 28 is provided with means deflecting dirt, etc., away from the valve structure and downwardly toward the bottom openings 23 and the outer side wall 18. Specifically, deflector strips 25 extend lengthwise of the casing top wall 14 and they are disposed between and secured to the honeycomb partition members 22 adjacent the valve 28. We have found that good results are obtained by the use of four of these strips, but it is to be understood that the number may be varied without departing from our invention. The inner edges of the strip 25 are extended inwardly of the casing where they are inclined downwardly and outwardly toward the outermost openings 23 and the side wall 18.

In the use of the structure above described, when the car is traveling in either direction, the imperforate end walls 16 present a closed wall surface to the pressure of the atmosphere. The motion of the edges of the structure in both the top and bottom walls 14 and 19 causes an aspirating effect which exerts a suction action upon the air within the ventilator so that there is a constant outflow of used air from the car when the valve 28 is open. In the event that dirt, etc., should find its way through the openings 23 of the bottom wall 19, the deflecting surfaces 24 will direct the same away from the valve 28 so that the same will be discharged through the openings 23 and the elongated opening 39 in the bottom wall 19 adjacent the outer side wall 18. This opening 39 extends throughout the length of the casings. Should dirt, etc., which finds its way through the open top wall, and particularly the portion thereof adjacent the valve 28, it will be deflected downwardly toward the bottom openings 23 and away from the valve 28 toward the outer side wall 18. If any dirt, etc., enters through the portion of the top wall which does not have the deflectors 25, it will tend to pass on downward and out through the bottom openings 23 due to gravity action as well as the suction action tending to draw air from the interior of the casing through such bottom opening. With the foregoing arrangement, it is practically impossible for dirt, etc., to collect within the casing. The valve 28 may be opened at all times and to various extents without dirt, etc., finding its way into the car through the ventilating opening 10. Should any dirt reach the inner part of the casing adjacent the valve, it will be caught by the flanged valve seat 27 and will not be dumped into the car when the valve is opened. The foregoing advantages are obtained regardless of whether the car is at rest or in motion.

The other advantages and features above first stated will be obvious from the foregoing description. By locating the aspirating means in the top and bottom casing walls, the height of the casing may be materially reduced with the advantages already stated.

While we have shown only one form of structure embodying our invention, it is to be understood that changes in details and arrangements of parts may be made without departing from the spirit and scope of our invention as defined by the claims which follow.

We claim:

1. In a ventilator of the class described, a casing of elbow-like shape having a horizontal portion disposed substantially parallel with the roof of the car and a vertical portion connected to the car ventilating opening; said horizontal portion gradually decreasing in height toward its outer end and having closed end and side walls, an open top wall, and a bottom wall having a plurality of aspirating openings therein; means in said top wall forming a plurality of aspirating openings; a valve between said horizontal and vertical casing portions, and angularly arranged deflectors associated with a portion only of said aspirating openings in the top wall and with all of said aspirating openings in the bottom wall and extending toward the outer side wall of said horizontal casing portion and away from said valve.

2. In a ventilator of the class described, a casing having a vertical portion adapted to be mounted over a ventilating opening in a car wall and a horizontal portion connected to the outer end of the vertical portion, said horizontal portion having a bottom wall substantially uniformly spaced from said car wall throughout its area and having a plurality of aspirating openings, each of which is provided with a deflector at one marginal edge projecting inwardly and laterally toward the outer side, said horizontal portion further having an open top wall which slopes laterally toward said bottom wall, and closed side and end walls, a grating unit fitted in the opening of said top wall to form a plurality of aspirating openings, and deflector strips incorporated in the inner side portion only of the grating unit and having angularly arranged inner edge portions wihch project inwardly of the grating and laterally in the same direction as said bottom wall deflectors.

3. In a ventilator of the class described, a casing of elbow-like shape having a vertical portion connected to the car ventilator opening and a horizontal portion connected to the outer end of the vertical portion, a strengthening partition extending across the casing substantially at the juncture of said vertical and horizontal portions and having an opening for the passage of air, said horizontal portion having end walls and an outer side wall which are closed, said horizontal portion also having a plurality of longitudinally extending aspirating openings in its bottom wall with one of the same located adjacent the closed side wall and with a curved deflector projecting inwardly and laterally toward the closed side wall from one marginal edge of each of said openings with the exception of the opening adjacent such side wall, said horizontal portion further having an open top wall with means arranged therein for providing a plurality of longitudinally extending rows of aspirating openings, and angular deflector strips extending longitudinally of some of the innermost rows of aspirating openings and each having an inner edge portion which projects toward said closed wall, all of said curved and angular deflectors projecting inwardly of the casing walls beyond edges of said partition opening.

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