Dec. 11, 1934. H. J. GRAHAM 1,983,979

BUS VENTILATOR

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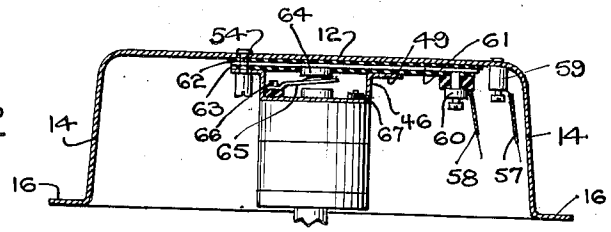


FIG. 2

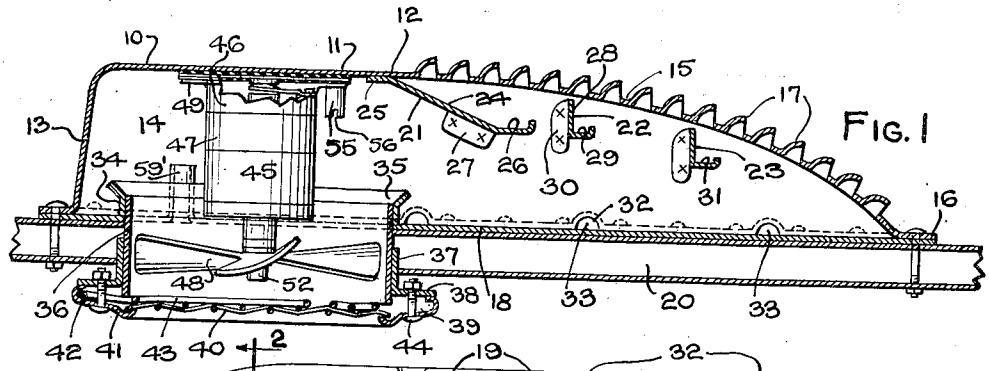


FIG. 1

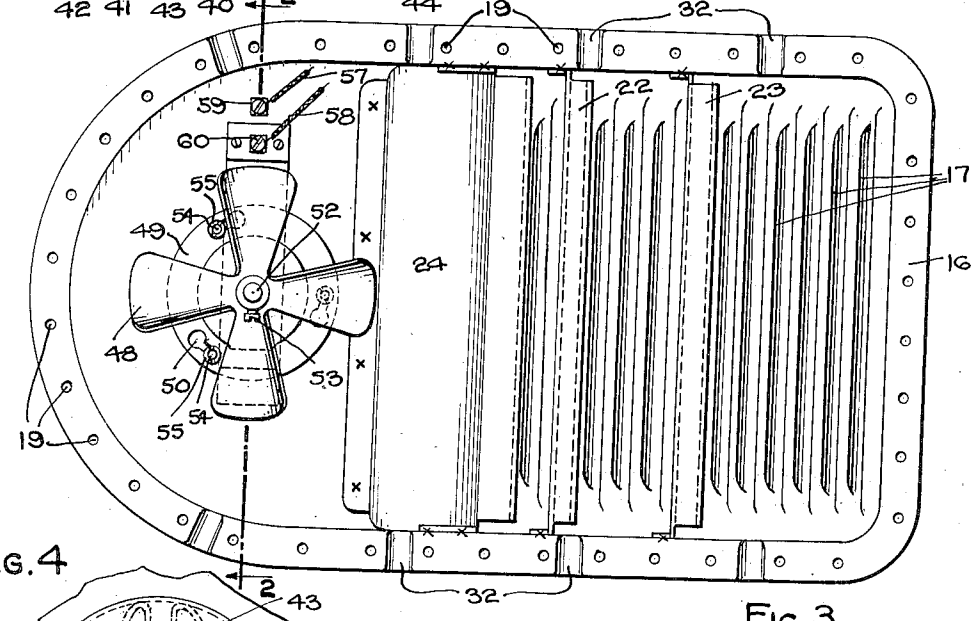
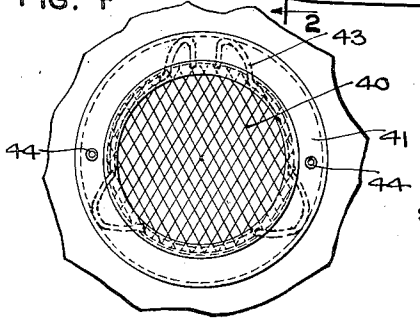


FIG. 3

FIG. 4



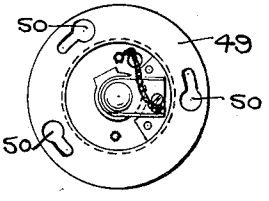


FIG. 5

INVENTOR
HERBERT J. GRAHAM
BY Lean Edelson
ATTORNEY.

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BUS VENTILATOR

Herbert J. Graham, Philadelphia, Pa., assignor to Electric Service Supplies Company, Philadelphia, Pa., a corporation of Pennsylvania

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7 Claims. (Cl. 98—2)

This invention relates generally to ventilators and more particularly to improvements in the construction of bus roof ventilators.

Among the principal objects of the present invention is to provide a bus roof ventilator which is highly efficient in exhausting all foul air from within the interior of the bus, the ventilator being so designed as to avoid all possibility of drafts being produced thereby.

A further object of the invention is the provision of a bus roof ventilator which is so designed and constructed as to prevent the leakage of water therethrough and into the interior of the bus, as well as to prevent the accumulation of leaves, dirt, etc. in the ventilator, the ventilator being further operative to effectually preclude the possibility of drawing snow or dust therethrough.

Still another object of the invention is the provision of a ventilator adapted for use in connection with vehicle roofs wherein motor-driven means is provided for effecting the exhaust of all foul air from within the interior of the bus even while the latter is stationary, this means being adapted, if desired, to facilitate the normal exhausting action of the ventilator while the vehicle is in motion.

A still further object of the invention is the provision of a louvered vehicle roof ventilator having operatively associated therewith a quick-detachably mounted motor-driven fan unit, the purpose of the latter being to facilitate the ventilation of the vehicle while the latter is at rest or in motion.

A still further object of the invention is the provision of a vehicle roof ventilator including means in operative association with the louvered section of the ventilator for preventing the ingress of water or rain into the interior of the vehicle and for discharging any rain or water which might enter through the louvers of the ventilator.

Other objects of the invention and advantages thereof, such as might result from the economies and simplifications of the design and construction of the ventilator, will be apparent more fully hereinafter.

The invention consists substantially in the combination, construction, location and relative arrangement of parts, all as will appear more fully hereinafter, as shown in the accompanying drawing and as finally pointed out in the appended claims. In said accompanying drawing:—

Figure 1 is a longitudinal vertical section of the ventilating unit constructed in accordance with and embodying the principles of the present invention;

Figure 2 is a transverse vertical sectional view taken on the line 2—2 of Figure 3;

Figure 3 is a bottom plan view of the unit with the bottom plate thereof removed;

Figure 4 is a bottom plan view of a portion of the ceiling of the vehicle showing the fan grille mounted in position; and

Figure 5 is a plan view of the motor base.

Referring now more particularly to the drawing, it will be seen that the ventilator, designated generally by the reference numeral 10, when constructed in accordance with and embodying the principles of this invention includes a main body member 11 which is pressed or stamped out of suitable rust-resisting sheet metal, this main body member being provided with a top 12, a front wall 13 and side walls 14. It will be observed that the top 12 is longitudinally contoured such that the rear portion 15 thereof slopes downwardly and terminates in a laterally extending flange 16 extending perimetrally about the bottom edges of the front wall 13 and side walls 14 of the body 11. It will further be observed that the sloping portion 15 of the ventilator body member 11 is provided with a plurality of longitudinally spaced substantially parallel louvers 17, each of the latter being of a width substantially coextensive with that of the top 12 of the ventilator body 11.

Adapted to underlie the body member 11 of the ventilator is a substantially flat bottom plae 18 the perimetral edges of which are substantially coincident with the corresponding edges of the perimetrally extending flange 16. This flange 16 and the portion of the bottom plate 18 which it overlies are respectively provided with a series of aligned apertures 19 through which rivets or other securing devices may be projected for securing the body member 11 and the bottom plate 18 in assembled relation and to the roof 20 of a vehicle body (see Figure 1). Extending between side walls 14 of the body member 11 of the ventilator are a series of longitudinally spaced rain shields or baffles 21, 22 and 23. The shield or baffle 21 is the foremost of the series and generally comprises a plate having an inclined body 24 the forward edge 25 of which is welded or otherwise secured to the under surface of the top 12 of the body 11. The lower edge of the inclined body 24 of the baffle 21 terminates in a gutter

26 for receiving any rain or water which may enter through the louvers immediately thereabove. Preferably, the opposite ends of the inclined body 22 are respectively provided with down-turned tabs 27 which are respectively adapted to be welded or otherwise secured to the inner surfaces of the opposed side walls 14.

The shields or baffles 22 and 23 are spaced with respect to each other and rearwardly with respect to the foremost shield or baffle 21. The baffle 22 is provided with a substantially vertically extending section 28 the bottom edge of which is provided with a rearwardly extending gutter 29. The baffle 22 is secured in position by means of forwardly turned tabs 30 provided at opposite ends of the section 28, these tabs 30 being respectively welded or otherwise secured to the side walls 14 of the louvered body 11. The rearmost shield or baffle 23 is similar in all respects to the intermediate baffle 22, it being observed that in both of the baffles 22 and 23 the upper edges of the vertically disposed sections thereof are practically in contact with the under surface of the louvered section 15 of the body 11. It will be observed that the gutters 26, 29 and 31 are of such length that the opposite ends thereof respectively terminate just short of the opposed walls 14 of the louvered body, thereby permitting the water entrapped within any or all of said gutters to pass freely beyond said ends and onto the plate 18. The flange 16 surrounding the bottom edge of the body 11 is provided with a plurality of perimetrally spaced raised portions 32, which, conjointly with the bottom plate 18 of the ventilator, provide vents 33 through which any water entrapped within the interior of the ventilator may escape onto the roof of the vehicle.

As appears most clearly in Figure 1, the bottom plate 18 is provided in the forward portion thereof with a relatively large opening surrounded by an upstanding annular flange 34. The upper edge of this flange 34 is preferably flared, as at 35, and the depth thereof is sufficient to prevent any water entrapped within the interior of the ventilator from escaping by way of the flanged opening.

Projecting downwardly through this flanged opening is a tubular shell 36 the upper end of which fits snugly within and is secured to the flange 34. As appears in Figure 1, the tubular shell 36 is adapted to extend downwardly through a suitably formed opening in the roof 20 of the vehicle body. Snugly embracing the shell 36 is a sleeve 37 the bottom edge of which is provided with an outwardly turned annular flange 38. This latter flange constitutes the support for a ceiling grille assembly 39 comprising the grille 40 (preferably in the form of a mesh wire screen) and its supporting annulus 41.

The outer edge of the annulus 41 is bent inwardly, as at 42, to provide a channel within which is received a spring wire retainer 43 for retaining the grille 40 in position. A plurality of bolts 44 or other such securing elements are projected through alined apertures respectively provided in the annulus 41 and the supporting flange 38 for securing the grille assembly in position extending across the bottom end of the shell 36. It will be observed that by virtue of the fact the sleeve 37 is slidably adjustable axially to the shell 36 it is possible to vary the distance between the flange 38 and the bottom plate 18 of the ventilator and so compensate for variations in thickness of the ceiling 20 of the vehicle body.

In a ventilator as just described, it will be understood that as the vehicle moves in a forward direction, a suction is established through the ventilator which draws the air from within the interior of the vehicle body in a direction upwardly through the grille 40 and thence through the louvers 17. Obviously, as the forward speed of the vehicle is materially decreased or if it is brought to rest, the suction effect induced by natural draft through the ventilator is greatly diminished in consequence of which proper ventilation is not obtained. In order to secure such proper ventilation even while the vehicle is at rest, a motor driven fan unit, designated generally by the reference numeral 45, is employed.

This fan unit generally comprises a motor support 46, a motor casing 47 and a multiple-blade fan 48. As appears most clearly in Figures 2 and 3, the motor support 46 is provided with an annular flange 49 having therein a plurality of circumferentially spaced key-shaped openings 50. Secured to the support 46 is the motor casing 47, the latter having extending through one end thereof the motor shaft 52. Secured to this shaft 52, preferably by means of a set screw 53, is the fan 48.

The fan unit is suspended from the top wall 12 of the ventilator with the axis of the unit substantially coincident with that of the shell 36, it being observed that when so suspended the fan 48 rotates in a plane immediately above that of the grille 40 and below that of the bottom plate 18 of the ventilator.

It is preferable to quick-detachably mount the fan unit in position and to accomplish this the top wall 12 of the ventilator is provided with a plurality of downwardly projecting threaded studs 54 with each of which is threadedly associated a nut 55. The ends of these nuts 55 are preferably kerfed, as at 56, to permit the use of a tool, such as a screw driver, for tightening and loosening the same. The studs 54 are relatively spaced for respective registry with the openings 50 in the flange 49 of the motor support, it being noted that the nuts 55 are of a size permitting them to pass freely through the enlarged portions of the key-shaped openings. To mount the fan unit in position, the nuts 55 are partially backed off their respective studs, whereupon the flange 49 is placed flatwise against the top wall 12 of the ventilator, the enlarged portions of the openings 50 in said flange permitting the latter to pass freely over the nuts 55. The unit is then rotated sufficiently to cause the studs 54 to be respectively received within the reduced portions of the openings 50 whereupon the nuts 55 are driven home to clamp the flange 49 securely in position.

It will be understood, of course, that the motor for driving the fan is preferably energized by the battery or other source of electric energy carried by the vehicle. The current from this source of supply is fed to the motor through the conductors 57 and 58 which pass upwardly through a tubular bushing 59' in the bottom plate 18 of the ventilator. These conductors 57 and 58 are respectively connected to the terminals 59 and 60 (see Figure 2). The terminal 59, it will be observed, is secured directly to the top wall 12 of the ventilator, while the terminal 60 is secured in insulating relation to said top wall 12.

Secured to the terminal 60 is a contact strip 61, this strip being interposed between the insulating strips 62 and 63 whereby to insulate the contact strip from the ventilator top wall 12 and the flange 49 of the motor support 46. As appears most clearly in Figure 2, a portion of the contact strip is exposed, as at 64, to constitute a center contact for the motor unit. The motor support is provided with an insulated contact spring 65 the free end of which is adapted to engage the exposed portion 64 of the contact strip when the fan unit is mounted in position. The conductors leading from the motor are respectively connected to the terminal 66 of the contact spring 65 and to the terminal 67 secured to the motor support. From the foregoing it will be apparent that the terminal 59 is electrically connected to the motor terminal 67 through the ventilator top wall 12 and the motor support 46, while the terminal 60 is electrically connected to the motor terminal 66 through the contact strip 61 and the contact spring 65. The fan unit is thus electrically connected in circuit with the source of supply (not shown) by the simple expedient of mounting it in position, it being unnecessary to disturb any of the electrical connections in order to mount the fan unit in its operative position or to remove it therefrom.

When the fan unit is mounted in position as shown in Figure 1 and the motor is energized, the fan will operate to exhaust the foul air from within the interior of the vehicle body. Not only does the fan unit operate efficiently to ventilate the vehicle while the latter is at rest but it also increases the ventilating efficiency of the ventilator while the vehicle is in motion. It will be understood, of course, that the invention is susceptible of various changes and modifications from time to time without departing from the real spirit or general principles thereof and it is accordingly intended to claim the same broadly, as well as specifically, as indicated by the appended claims.

What is claimed as new and useful is:—

1. In a bus ventilator, in combination, a main body member having front, top and side walls, the top wall being tapered downwardly toward the rear thereof so that the rear transverse edge of the top lies substantially in the plane of the bottom edges of said front and side walls, a plurality of transversely extending louvers formed in the tapering portion of said top wall, and a plurality of transversely extending rain gutters arranged below the louvered top wall and in longitudinally spaced relation, the opposite ends of said gutters terminating short of the opposite side walls of the body member.

2. In a bus ventilator, in combination, a main body member having front, top and side walls, a rear portion of the top wall being inclined downwardly and rearwardly so that the rear edge thereof lies substantially in the horizontal plane of the bottom edges of the side walls, a plurality of transversely extending louvers formed in the inclined portion of the top wall, a plurality of rain gutters arranged beneath the louvered portion of the top wall and extending transversely thereof, the opposite edges of said gutters terminating short of the side walls of the body member, and a bottom plate secured to the perimetral edges of the body member, the side walls of said member being respectively provided with a plurality of longitudinally spaced vents through which water entrapped within the interior of the ventilator body may escape.

3. In a bus ventilator, in combination, a main body member having front, top and side walls, the perimetral edges of which are adapted to be secured to the roof of the vehicle, the top wall of said body member being rearwardly and downwardly inclined so that the rear transverse edge thereof is also adapted for securement to the roof of the vehicle, a plurality of louvers in the inclined portion of the top wall of the body member, a plurality of rain gutters extending transversely beneath the louvered portion of the ventilator body and in longitudinally spaced relation, the opposite ends of said gutters being terminated short of the opposite side walls of the ventilator body, and a plurality of longitudinally spaced vents formed in the bottom edges of the said side walls through which water entrapped within the interior of the ventilator may escape on the roof of the vehicle.

4. In a vehicle of the character described, in combination, a main body member having front, top and side walls, the top wall thereof being inclined downwardly and rearwardly and being provided in said inclined portion with a plurality of transversely extending louvers, a bottom plate secured to the perimetral edges of the ventilator body to provide a bottom closure therefor, said bottom plate being provided adjacent the forward end thereof with a relatively large aperture, a tubular shell fitted within said aperture and adapted to be projected downwardly through a suitable opening provided therefor in the roof of the vehicle, and a ceiling grille assembly secured to and embracing the lower end of said tubular shell, said grille assembly being adjustable axially of said tubular shell whereby to compensate for variations in thickness of the ceiling of the vehicle.

5. In a vehicle roof ventilator of the character described, in combination, a main body member having top, front and side walls, the rear portion of the top wall thereof being inclined downwardly and rearwardly and provided with a plurality of transversely extending ventilating louvers, a bottom plate secured to the perimetral edges of the body member to provide a bottom closure therefor, said bottom plate being provided adjacent the forward end thereof with a downwardly projecting tubular shell, an electrically operated motor secured to the top wall of the ventilator body with the motor shaft thereof substantially coaxial with the vertical axis of said shell, a fan secured to the lower end of said motor shaft and adapted for rotation within the confines of said tubular shell, and an axially adjustable ceiling grille assembly telescopically mounted upon the lower extremity of said tubular shell.

6. In a ventilator of the character described, in combination, a louvered ventilating body adapted to induce a draft therethrough for exhausting the foul air from within the interior of a vehicle equipped with said ventilator body, said ventilator body being provided with an opening therein affording communication between the interior thereof and the interior of the vehicle, a fan unit adapted to be detachably secured against the top wall of the ventilator body and above the opening aforesaid, said unit comprising a motor support, a motor casing and a fan, the fan being projected through said opening for rotation in a plane disposed immediately beneath the bottom wall of the venti-

lator body, said fan unit being operatively secured in position to said ventilator body by means of bayonet and slot connecting elements respectively provided in the top wall of the ventilator body and in the motor support.

7. In a ventilator of the character described, in combination, a louvered ventilating body adapted to induce a draft therethrough for exhausting the foul air from within the interior of a vehicle equipped with said ventilator body, said ventilator body being provided with an opening therein affording communication between the interior thereof and the interior of the vehicle, a fan unit adapted to be detachably secured against the top wall of the ventilator body and above the opening aforesaid, said unit comprising a motor support, a motor casing and a fan, the fan being projected through said opening for rotation in a plane disposed immediately beneath the bottom wall of the ventilator body, said fan unit being operatively secured in position to said ventilator body by means of bayonet and slot connecting elements respectively provided in the top wall of the ventilator body and in the motor support, and electrical contact members respectively provided in the top wall of the ventilator body and in the motor support for completing the electrical circuit to the fan motor when the fan unit is operatively secured in position.

HERBERT J. GRAHAM.