Jan. 12, 1954

W. J. WOODHAMS

2,665,625

VENTILATOR ASSEMBLY

Filed April 10, 1950

3 Sheets-Sheet 1

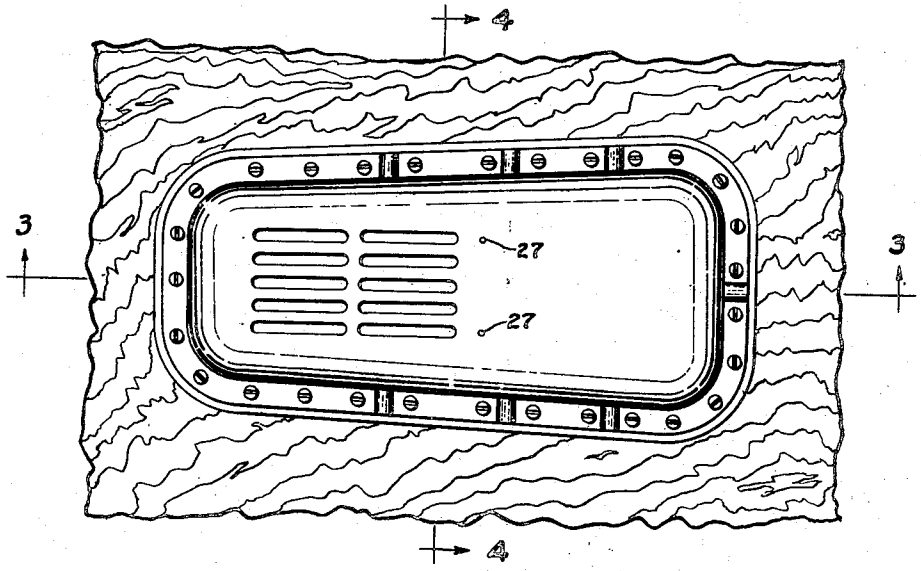


FIG-1

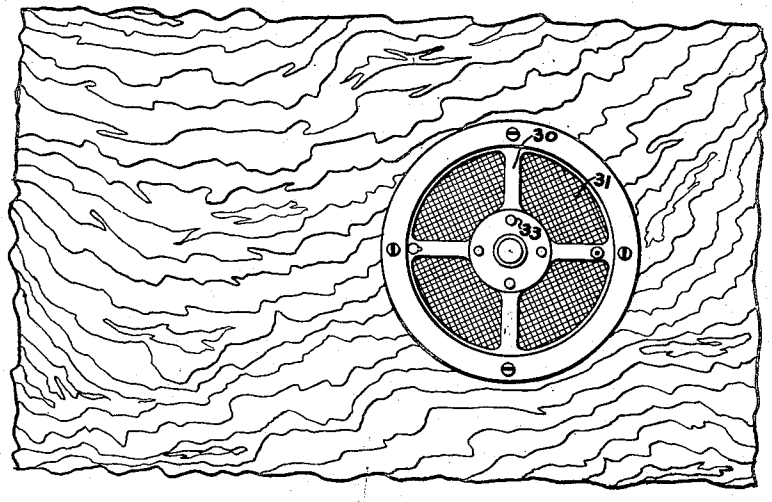


FIG-2

INVENTOR
WALTER J. WOODHAMS
BY Roy A. Plant
ATTORNEY

Jan. 12, 1954 W. J. WOODHAMS 2,665,625

VENTILATOR ASSEMBLY

Filed April 10, 1950

3 Sheets-Sheet 2

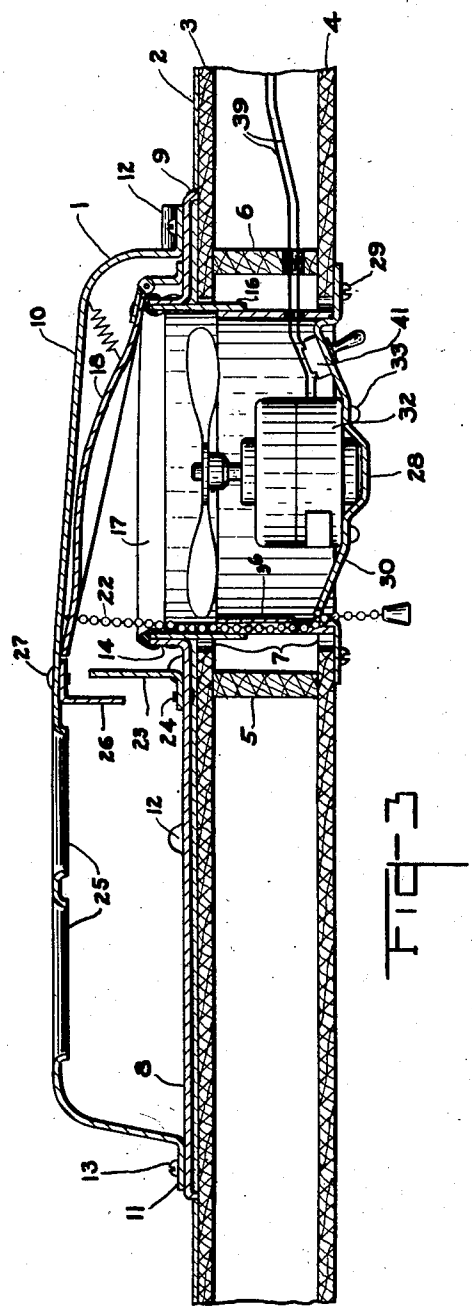


FIG. 3

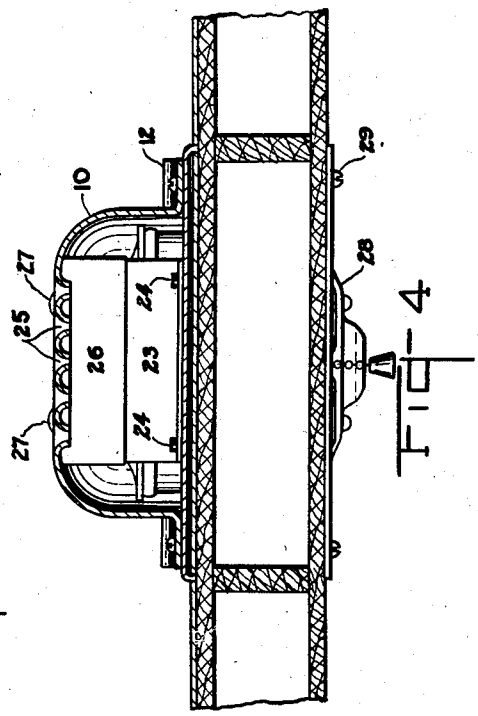


FIG. 4

INVENTOR
WALTER J. WOODHAMS
BY Roy A. Plant
ATTORNEY

Jan. 12, 1954 W. J. WOODHAMS 2,665,625

VENTILATOR ASSEMBLY

Filed April 10, 1950

3 Sheets-Sheet 3

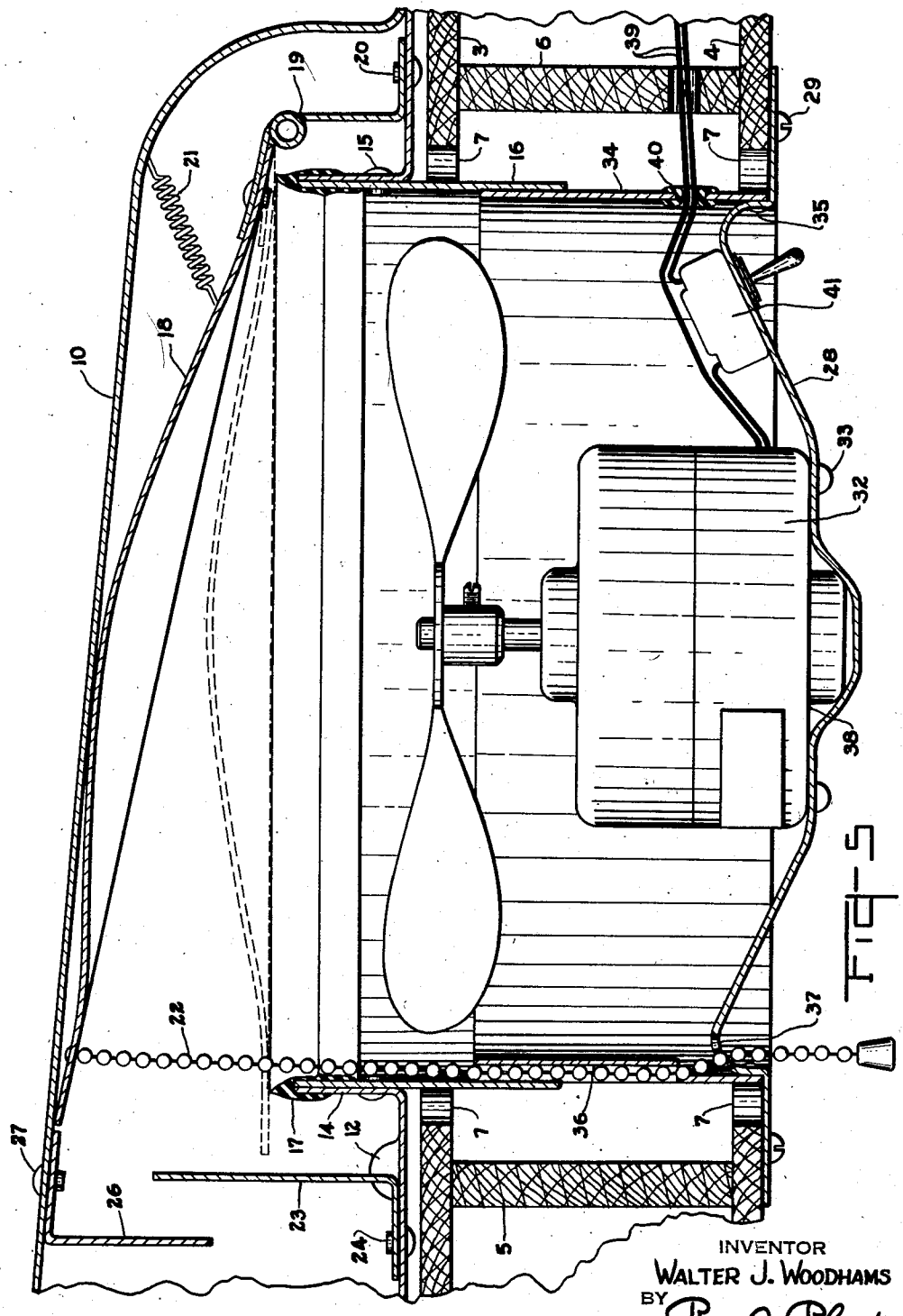


FIG-5

INVENTOR
WALTER J. WOODHAMS
BY Roy A. Plant
ATTORNEY

Patented Jan. 12, 1954

2,665,625

UNITED STATES PATENT OFFICE

2,665,625

VENTILATOR ASSEMBLY

Walter J. Woodhams, Marshall, Mich., assignor to Woodlin Metal Products Company, Marshall, Mich.

Application April 10, 1950, Serial No. 155,018

8 Claims. (Cl. 98—19)

1

The present invention relates broadly to ventilation apparatus, and in its specific phases to a ventilator particularly adapted for use in the roof of a bus or house trailer.

House trailers are almost universally provided with roof ventilators of the type which have a cover hinged at the top forward edge of the ventilator which is also provided with a mechanism for tilting the ventilator cover upward for ventilation purposes. This is a relatively satisfactory arrangement for non-rainy weather. In hot weather it is standard practice to leave these ventilators open, even while the trailer occupants are away from the trailer on shopping or sightseeing trips. Under those conditions if a rain storm suddenly comes up, the result is that the rain will pass through the open ventilator onto whatever is below it inside the trailer. In any event it is desirable to have a rain proof ventilator which can be left open or closed, at will, without danger of leakage. Busses are also subject to the requirement of controlled ventilation for maximum comfort regardless of whether there is rain or sunshine, and yet busses are either not provided with roof ventilators or are equipped with ventilators which are generally subject to leakage if not properly controlled. It was a recognition of these problems and difficulties which lead to the conception and development of the present invention.

Accordingly among the objects of the present invention is the provision of a roof type ventilator which can be left open without danger of leakage even in driving rain storms.

Another object is to provide a roof type ventilator having a special form of inturned louvers which are equally effective regardless of horizontal wind direction or movement of the vehicle on which the ventilator is mounted.

Another object is to provide an internally baffled roof type ventilator with inturned top surface louvers, wherein any water passing through said louvers will drain out of the ventilator assembly without leaking into the interior of the vehicle on which the ventilator is mounted.

Another object is to provide an inturned top louver type of roof ventilator having an opening into the interior of the vehicle on which said ventilator is mounted, and wherein such opening is offset to one side from in under said louvers and is provided with a damper which may be opened or closed at will.

A further object is to provide a roof ventilator of the inturned top louver type which can be operated as a natural draft ventilator or a fan operated ventilator.

2

A further object is to provide a roof ventilator of the inturned top louver type which is easy to manufacture, readily installed, positive in action, and of relatively low cost.

Still further objects and advantages of the present invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the ventilation apparatus hereinafter fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain means for carrying out the invention, such disclosed means illustrating, however, but one of various ways in which the principle of the invention may be used.

In the annexed drawings:

Figure 1 shows a top view of a preferred form of the ventilator assembly of the present invention mounted on a fragmentary section of a roof.

Figure 2 shows a bottom view of the ventilator assembly of Figure 1 mounted on a fragmentary section of a roof.

Figure 3 shows a partially sectioned longitudinal view as taken along line 3—3 of Figure 1 looking in the direction of the arrows.

Figure 4 shows a partially sectioned transverse view as taken along line 4—4 of Figure 1 looking in the direction of the arrows.

Figure 5 shows, on an enlarged scale, a partially sectioned longitudinal view of the fan assembly portion of Figure 3.

Referring more particularly to Figure 3 of the drawings it will be noted that the ventilator assembly 1 is mounted on a roof 2 of hollow construction, typical of house trailers, which has top and bottom panels 3 and 4 with transverse reinforcing spacers 5 and 6 at opposite sides of circular roof opening 7 through which the ventilator assembly extends.

The upper portion of the ventilator assembly 1 has a roof plate 8, the marginal edges of which are preferably provided with a downturned flange 9 for rigidity and a tight roof seal. Mounted on roof plate 8 is an upwardly extending cover member 10 which has an outwardly extending flange 11 at its bottom with drain ribs 12 at intervals therein. Roof plate 8 and flange 11 of cover 10 are provided with aligned holes at intervals for the reception of screws 13 which are used to fasten the cover and roof plate to top panel 3 of the roof as shown.

Roof plate 8 is provided at one end with an upturned flange 14, which is preferably circular. Fastened to that flange, by means of rivets 15 or

the like, is a short downwardly extending sleeve 16 adapted to fit into roof opening 7 and extend part way through roof 2. Mounted on the upper edge of flange 14 and sleeve 16 is a gasket 17 which is preferably made of moderately soft rubber. The bottom of this gasket is preferably of hollow, generally U-shape cross section, which will facilitate fastening same to flange 14 and sleeve 16 in conventional manner, such as by cementing, while the upper edge of the gasket is preferably relatively thin to form a tight seal on damper 18 when in closed position as shown in dotted lines in Figure 5. Damper 18 is pivotally mounted on a hinge member 19 which is fastened, as by means of rivets 20, one of which is shown in Figure 5, to the end portion of roof plate 8. A tension spring 21, which may be of any suitable form, is used to hold damper 18 in upper or open position when same is not held down by means of closing chain 22 as will be hereinafter described.

Crosswise of roof plate 8, adjacent the side of upturned flange 14 opposite to hinge member 19, is an upstanding baffle plate 23, which is preferably a little higher than the top of gasket 17 and normally as high as the bottom of baffle plate 26. This baffle plate 23 may be made short of extending to the top and sides of cover 10, as shown, to permit free flow of air past same under conditions of operation of the ventilator, and may be anchored in conventional manner to roof plate 8, as by rivets 24, one of which is shown.

The top face of cover 10 is provided in the half thereof not over the upturned flange portion 14 of the ventilator assembly, with a plurality of louvers 25, which are preferably of the inturned type shown in the drawings, since that type of louver causes the ventilator assembly to be substantially unaffected in its operation regardless of horizontal wind direction, or movement of the vehicle on the roof of which the ventilator is used.

Mounted on cover member 10 between louvers 25 and upstanding baffle plate 23 is a downturned baffle plate 26 which is held in place in any convenient manner, such as by rivets 27, two of which are shown in Figure 1. This baffle plate 26 preferably extends down one quarter to three quarters of the way to roof plate 8, and normally a little below and forward of the top of baffle plate 23. For most purposes baffle plate 26 is made a little wider than the width of the louvers 25, as shown in Figures 3 and 4, to permit ready circulation of air through the ventilator assembly while baffling any rain which passes through louvres 25 and substantially preventing passage of same over the top of gasket 17 even when damper 18 is open.

The bottom portion of the ventilator assembly utilizes a ceiling plate 28 which is preferably of spider form as shown in Figure 2. This plate may be fastened to bottom panel 4 in any convenient manner such as by means of screws 29. The space between spokes 30 of ceiling plate 28 is preferably closed by means of screen 31 to stop passage of flies and mosquitoes through the assembly from outdoors when electric fan 32 is not in operation, and damper 18 is open. This electric fan, for house trailer use, would be connected so as to normally operate to blow in an upward direction, and can be mounted in operative position in any convenient manner, such as by means of screws 33 for joining same to ceiling plate 28.

Mounted on the upper face of ceiling plate 28 is an upwardly extending sleeve 34, which may be fastened to same in any convenient manner, such as by means of rivets 35, Figure 5. This upwardly extending sleeve 34 is preferably of a diameter permitting it to closely fit and telescope into the downwardly extending sleeve 16 of the upper portion of the assembly so as to facilitate use of the assembly on roof panels of varying thickness. At one edge of this upwardly extending sleeve 34 same may be provided with an inturned rib 36, extending part way down from its top, for the purpose of guiding and guarding closing chain 22 in its operative movements. Ceiling plate 28, directly below rib 36, is provided with a slot 37, which is enlarged at one end, so that said chain 22 can be freely moved through said enlarged portion but when slid sidewise into the narrow portion of said slot the chain will be held against endwise movement, thus making possible the adjustment and holding of damper 18 in various positions from wide open to closed.

The motor 38 of electric fan 32 is supplied with operating current through electric connection wires 39, leading to a suitable source of electricity, which pass through an insulating grommet 40, Figure 5, in upwardly extending sleeve 34. Electric switch 41, mounted on one of the spokes of ceiling plate 28, is used to control the fan operating periods in conventional manner.

A convenient size of the above assembly, as seen in Figure 1, is approximately 6" to 8" wide and 24" long, with the other parts of proportionate size. It will thus be seen that an assembly of this type, when mounted on the roof of a house trailer or bus, with damper 18 open, will permit ventilation by natural draft, while the closing of the damper, through the operation of chain 22, will stop this natural air flow. On the other hand the operation of electric fan 32 with damper 18 open will provide forced circulation, which is desirable in hot weather, as well as for the removal of cooking odors. This assembly can be left open for natural or forced ventilation during rain storms without danger of leakage into the interior of the vehicle on which it is mounted since any rain passing into the ventilator assembly will fall onto roof plate 8 and drain out through drain ribs 12.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the apparatus herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A ventilator assembly, which comprises a roof plate having an opening therethrough at one end, a watertight upturned flange circumscribing said opening, a damper for closing said opening and covering said flange, a hinge for said damper, means including a holding mechanism for holding said damper in various positions as well as opening and closing same, an upwardly extending cover member for said roof plate, said cover member being in the form of an open bottom hood with side panels, and a substantially flat top panel, inturned louvers in said substantially flat top panel of said cover member, all of said louvers extending inwardly from said substantially flat top panel so as to be substantially equally efficient under front, rear, or sidewise wind direction and being located at one end of same so as to leave an unperforated portion of the top panel of said cover member completely

covering and elevated above said upturned flange opening through said roof plate, said hinge for said damper being at the edge of same remote from said louvers to facilitate air flow when said damper is in open position, drain members for draining out any liquid passing through said louvers into the space between said roof plate and said cover member, a downwardly extending sleeve tightly fitting said upturned flange circumscribing said opening through the roof plate, a ceiling plate, a second sleeve mounted on said ceiling plate and telescopically fitting said first sleeve to form a relatively tight but free rotary and endwise adjustable fit therewith, means for anchoring said sleeves in fixed position relative to each other, and at least one baffle member within the space between said roof plate and cover member, said baffle being mounted between all of said louvers on one side and said upturned flange on the other to block direct passage of liquid, such as rain, through said louvers and into the top of said flanged opening while leaving a suitable passageway for gaseous fluid flow in series through said dampered opening and louvers of said assembly when said damper is open.

2. A ventilator assembly as set forth in claim 1, wherein there is a gasket for making a tight seal between said damper and the top of said upturned flange portion of the assembly when said damper is closed, and at least one baffle member extending down from the top panel of said cover member, said baffle member being narrower than said cover member to provide a gaseous fluid passageway between the ends of same and the sides of said cover member, said baffle member also extending down from the top panel of said cover member to a level near that of the top of said gasket while being spaced forward of same toward said louvers to block direct flow of rain through the latter and into the top of said gasketed opening when said damper is open, and a second baffle member extending up from said roof plate between said upturned flange and said first named baffle but spaced from the latter and at least as high as the lower edge of same so as to facilitate blocking direct flow of rain through said louvers into the top of said gasketed roof flange without blocking the ventilating flow of air when said damper is open.

3. A ventilator assembly, which comprises an elongated roof plate having an opening therethrough at one end, a watertight upturned flange circumscribing said opening, a downwardly extending sleeve closely fitting and anchored in said upturned flange, a damper for closing and covering the opening through said flange and sleeve, a hinge for said damper, a spring tensioned to normally hold said damper open, an apparatus for opening and closing said damper, said opening and closing apparatus including cooperating members for holding said damper in various positions, an elongated upwardly-extending cover member for said roof plate, said cover member being in the form of a hood with side panels, end panels, and a top panel, louvers in the top panel of said cover member, said louvers being located so as to be in the portion of said top panel which is not over said flanged opening in said roof plate, said cover member having drain openings at the bottom of same adjacent said roof plate for use in draining out any liquid passing through said louvers into the space between said roof plate and said cover member, an electric fan, means for supporting said fan directly below said damper in position for forcing gaseous fluid flow through said downwardly extending sleeve when said damper is open, and at least one baffle member within the space between said roof plate and the top panel of said cover member, said baffle being mounted between said louvers and said upturned flange carrying said sleeve to block direct passage of liquid, such as rain, through said louvers and into the top of said flanged opening while leaving a suitable passageway for gaseous fluid flow in series through said dampered opening and louvers of said assembly when said damper is open.

4. A ventilator assembly as set forth in claim 3, wherein there is a rubber gasket on the upper end of said upturned flange and sleeve for making a tight seal between said damper and the top of said flange and sleeve when said damper is closed, and wherein there is a baffle extending down from the top panel of said cover member between said louvers and said flanged opening, said baffle member being as wide as said louvers but being short of reaching the side walls of said cover member to facilitate free flow of gaseous fluid between the ends of said baffle and said side walls, said baffle extending down part way to said roof plate, and a second baffle mounted on said roof plate and extending upward at least as high as the bottom of said first baffle, said second baffle being spaced a substantial distance from said first baffle and being located between it and said flanged opening to block direct flow of rain through said louvers and into the top of said gasketed opening when said damper is open.

5. A ventilator assembly as set forth in claim 3, wherein there is a second sleeve member telescopically fitting said first sleeve member, and mounted on the lower end of said second sleeve member is a ceiling plate perforated for flow of gaseous fluid therethrough, and having a portion for carrying said electric fan.

6. A ventilator assembly, which comprises an elongated roof plate, an elongated upwardly extending cover member with extending bottom flange resting on said roof plate to form a compartment, said cover member being in the form of a hood with side panels, end panels, and a top panel, inturned louvers at one end of the top panel of said cover member, drain ribs in the bottom of said cover member for use in draining out any liquid passing through said louvers into said cover member, a watertight upturned flange in said roof plate at the end of same not covered by said louvers, a downwardly extending sleeve closely fitting said upturned flange and anchored in place to same, a rubber gasket on the upper end of said upturned flange and sleeve, a damper over said gasket for opening and closing the passageway through said upturned flange and sleeve, a hinge for said damper, said hinge being mounted in fixed position at the side of said upturned flange furthest from said louvers, a tensioned spring for normally holding said damper in open position, a baffle extending downwardly from said top panel at the edge of said louvers adjacent said upturned flange, said baffle being as wide as the distance across said louvers adjacent said flange, said baffle extending downward approximately one quarter to three quarters of the way to said roof plate, a second baffle spaced from the first and between it and said upturned flange, said second baffle being approximately as high as the bottom of said first baffle and attached to said roof plate so as to block direct passage of rain through said louvers into

said gasketed passageway when said damper is open, at least one of said baffles being shorter than the width of said cover member to provide an open passageway at each end of same, a second sleeve member telescopically fitting the lower end of said first sleeve member, a ceiling plate at least as large as the opening through said second sleeve member, means for mounting said ceiling plate on the end portion of said second sleeve member remote from that telescopically fitting said first sleeve member, a flexible operating member connected to said damper member at the side opposite its hinge and passing through said telescoping members, and an anchoring member for releasably holding said flexible member with said damper at various positions between fully open and closed, said ceiling plate having a major portion of same cut away in the area of the end of said second sleeve to which it is attached so as to facilitate flow of gaseous fluid therethrough in series with said sleeve members and said louvers when said damper is open.

7. A ventilator assembly as set forth in claim 6, wherein said ceiling plate is provided with a fan supporting portion, and an electric fan mounted within said telescoping sleeves on the upper face of the fan supporting portion of said ceiling plate and below said damper to provide forced draft out through said louvers when said fan is in operation and said damper open.

8. A ventilator assembly, which comprises a roof plate having an opening therethrough at one end, a watertight upturned flange circumscribing said opening, a damper for opening and closing said opening through said flange, a hinge for said damper, spring means normally exerting opening pressure on said damper, means connected to said damper for operating and holding same

in various positions, an upwardly extending substantially flat top cover member for said roof plate, said cover member being in the form of an open bottom hood having side panels, end panels, and a top panel, inturned louvers in the top panel of said cover member and substantially entirely below said top panel, said louvers being located at one end thereof so as to leave an unperforated portion of the top panel of said cover member completely covering and sheltering said flanged opening through said roof plate, drain members at the junction of said cover member and roof plate for draining out any liquid passing through said louvers into the space between said roof plate and said cover member, an electric fan, a spider member below said damper, the central portion of said spider member being adapted to carry and anchor said electric fan below said damper, and a screen for closing the openings between the legs of said spider.

WALTER J. WOODHAMS.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,245,826	Turner	Nov. 6, 1917
1,550,503	Coffman	Aug. 18, 1925
1,955,089	Pine et al.	Apr. 17, 1934
1,983,979	Graham	Dec. 11, 1934
2,157,609	Hopkins	May 9, 1939
2,159,516	Ball	May 23, 1939
2,211,367	Davey et al.	Aug. 13, 1940

FOREIGN PATENTS

Number	Country	Date
541,434	Great Britain	Nov. 26, 1941