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2,885,941

PORTLIGHT AND SKYLIGHT VENTILATOR

Filed April 30, 1956

3 Sheets-Sheet 1

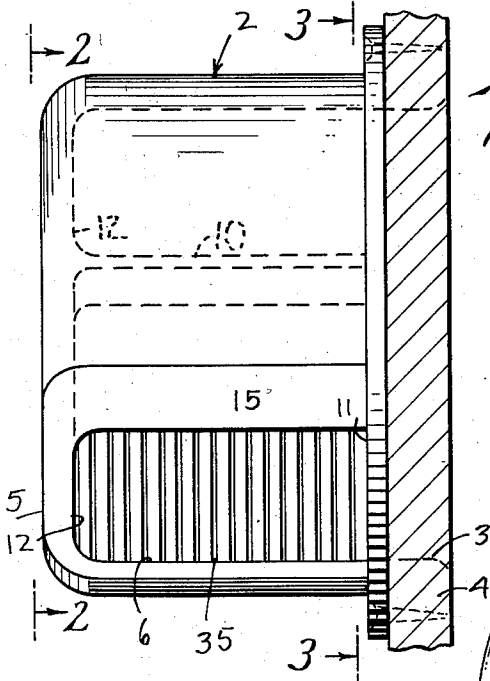


Fig. 1

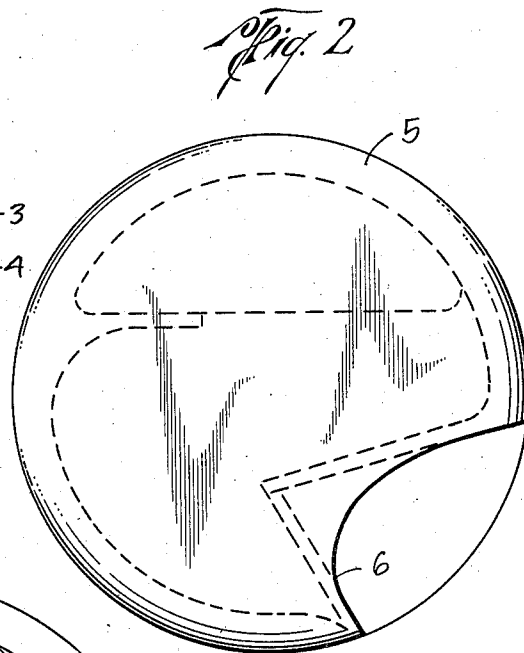


Fig. 2

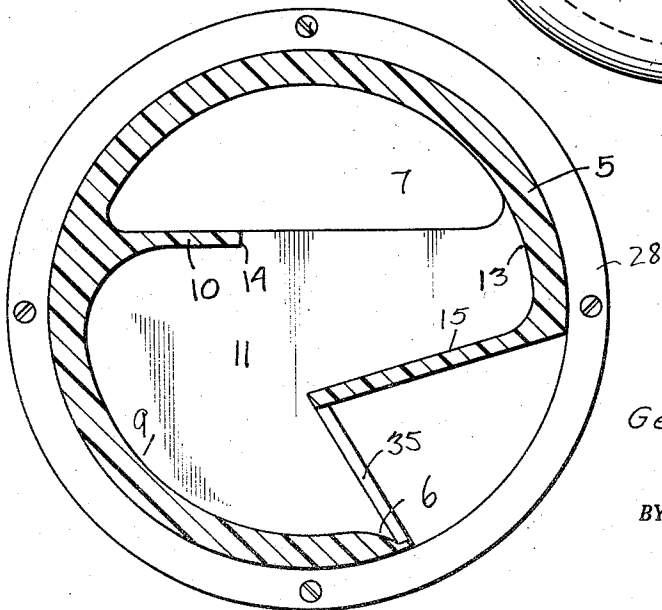


Fig. 3

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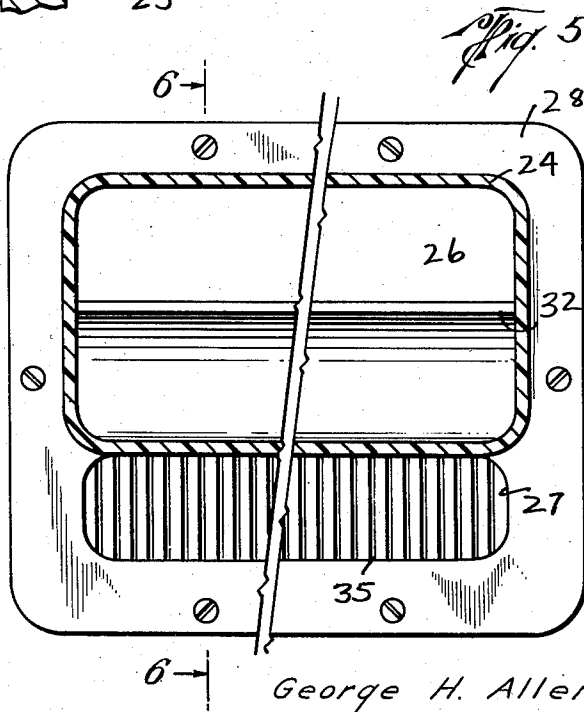
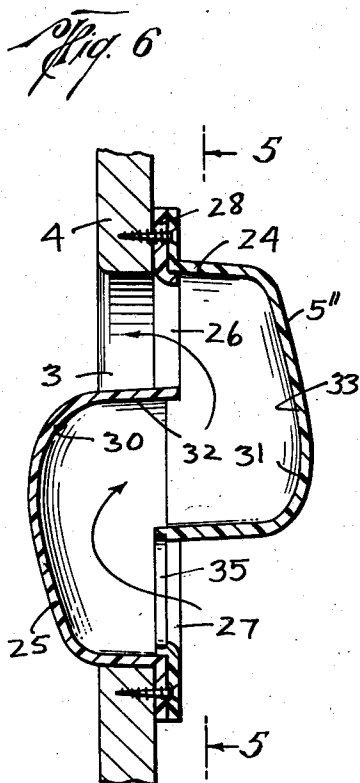
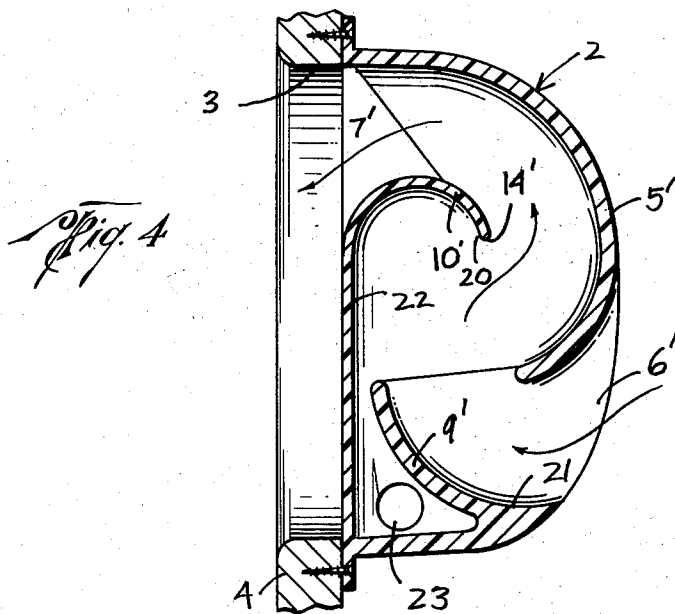
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3 Sheets-Sheet 2



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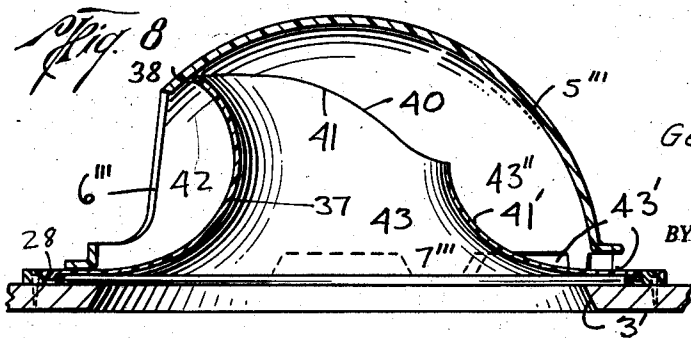
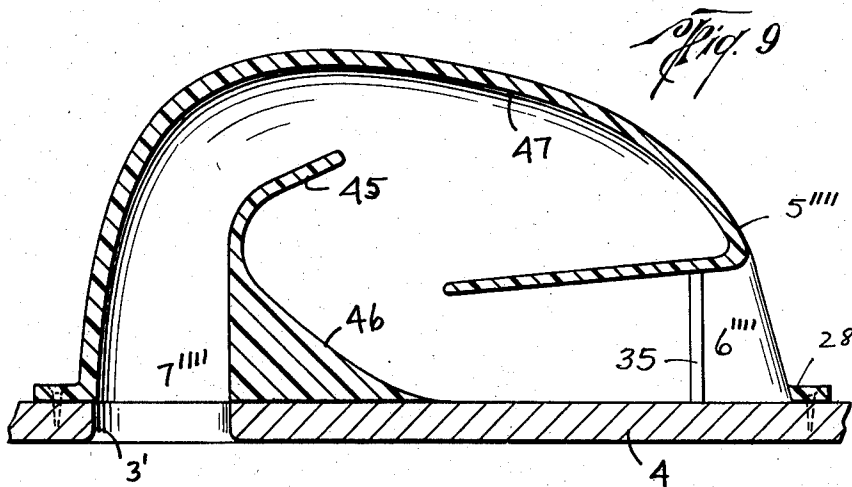
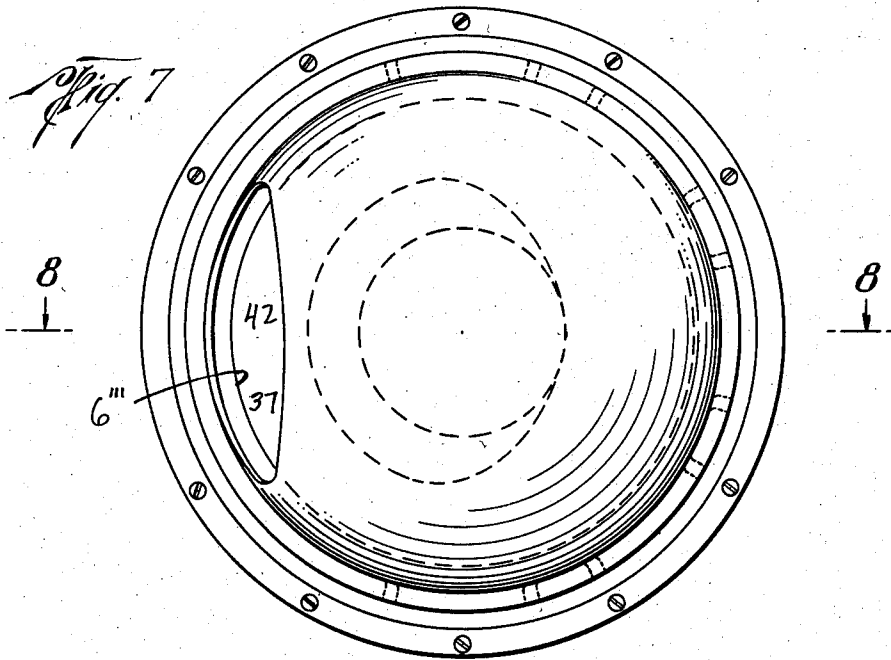
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PORTLIGHT AND SKYLIGHT VENTILATOR

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3 Sheets-Sheet 3



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PORTLIGHT AND SKYLIGHT VENTILATOR

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6 Claims. (Cl. 98—37)

The present invention relates to a skylight and portlight vent for use on boats or in other similar situations where it is desired to admit air but to exclude water.

Various constructions have been proposed as portlight or skylight vents but such constructions have not adequately solved the problem of inhibiting water entry along with the air admitted through the port or deck opening.

The present invention provides a construction which overcomes the above difficulty and can be manufactured relatively inexpensively.

An object of the present invention is to provide a ventilator structure wherein air is conducted therethrough in a predetermined path to encourage separation of any water from the air.

Another object of the invention is to provide a ventilator wherein the air inlet and discharge openings therein are positioned in relation to each other to encourage separation of water from the air before it reaches the discharge opening.

Still a further object of the invention is to provide a ventilator for boats wherein cooperating surfaces are provided to encourage separation of any water from the air as it passes through the ventilator.

Other objects and advantages of the present invention will become more readily apparent from a consideration of the following description and drawings wherein:

Fig. 1 is a front elevation of one form of the invention showing it positioned over a port;

Fig. 2 is a top plan view on line 2—2 of Fig. 1;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1 illustrating the details of construction of the form of the invention shown in Fig. 1;

Fig. 4 is a vertical section illustrating another form of the invention;

Fig. 5 is a sectional view on the line 5—5 of Fig. 6 illustrating another form of the invention;

Fig. 6 is a sectional view on the line 6—6 of Fig. 5 showing the arrangement of the opening and exit in this form of the invention and the surface arrangement for inhibiting water entry along with the air;

Fig. 7 is a top plan view of an alternate form of the invention;

Fig. 8 is a sectional view on the line 8—8 of Fig. 7 showing the details of construction of this form of the invention; and

Fig. 9 is a vertical sectional view illustrating still another embodiment of the ventilator of the present invention.

Attention is directed to Fig. 1 of the drawings wherein a ventilator embodying the structural arrangements of the present invention is illustrated generally by the numeral 2 as being positioned over the opening 3 in the structure 4 for admitting air through the ventilator to the opening while at the same time excluding the entry of water. The ventilator 2 is illustrated in Fig. 1 as including the hollow casing 5 which is provided with an air admitting opening 6 for conducting air into the

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casing, which opening is arranged adjacent the lowermost portion or bottom of the casing 5 as shown in Figs. 1, 2 and 3 of the drawings. The casing is also provided with an air exit 7 for discharging the air from the casing through the opening 3 in the structure 4. It is to be noted that the exit opening 7 is positioned above the air admitting opening 6 so that the air passing through the ventilator must pass upwardly from the air inlet opening 6 to the exit or discharge opening 7 in order to be admitted through the opening 3 of the structure 4. This arrangement is advantageous in that it encourages the separation of foreign material such as water from the air passing through the ventilator from the inlet to the exit. The casing 5 is also provided with a curved inner wall 9 which directs the air entering through the inlet 6 in a curved path in the casing so as to further encourage separation of any foreign matter in the air, such as water, by centrifugal force. It will be noted that the curved inner wall 9 terminates in the deflector 10 which is spaced above the air opening 6 as illustrated in Fig. 3 of the drawings. The deflector 10 extends from the inner wall or surface 11 of the casing to the outer surface 12 thereof so that the deflector in cooperation with the inner casing wall 9 forms a curved, upwardly directed air passage from the inlet 6 and the air from such inlet must pass through this passage prior to passing to the discharge opening 7 arranged above the deflector 10 as illustrated in Fig. 3 of the drawings.

It is to be further noted that the inner casing wall 13 which is in opposed relation to the end 14 of the deflector 10 is constructed and arranged so that any foreign matter such as water which may be thrown thereagainst as the air leaves the end 14 of the deflector 10 will flow therealong and along the surface 15 towards the opening 6. The surface 15 extends between the inner and outer casing ends 11 and 12. The surface 13 is sloped downwardly to flow any water separated from the air toward the inlet 6 and away from the outlet 7. Also, the end 14 of the deflector 10 is directed toward surface 13 at an angle so that water from the deflector and hitting surface 13 will be deflected away from outlet 7.

The construction and arrangement of the curved inner wall 9, the deflector 10 and the wall 13 in opposed relation to the deflector 10 cooperate to guide the air from the air inlet opening 6 in a predetermined curved path to encourage separation of water therefrom by centrifugal force prior to discharge of the air through exit 7 into structure opening 3. Also the surfaces cooperate to guide separated water away from outlet 7 to inhibit passage thereof through opening 3.

Also, the arrangement of the air admitting opening 6 at the lowermost portion or at the bottom of the casing 5 with the deflector 10 positioned thereabove and between the inlet 6 and the discharge opening 7 arranged on the other side of, or above, the deflector 10 encourages further separation of any water from the air since the air must travel upwardly from the inlet to the outlet within the casing 5 prior to discharge through structure opening 3 and, therefore, gravity will tend to separate the water from the air as it passes upwardly within the casing.

It is to be further noted that the construction and arrangement of the opening 6 in relation to the curved wall 9, the deflector 10 and the discharge opening 7 is such that the direction of the flow of air within the casing is reversed, thus aiding in further separation of any water entering with the air into the casing.

A flared portion or flange 28 may be provided adjacent the inner end 11 of casing 5 through which suitable means such as screws may be engaged to position the casing 5 over opening 3.

All of the drawings represent embodiments of the invention wherein the air is conducted in a predetermined path through the ventilator so as to encourage separation of any water from the air as the air passes there-through.

In Fig. 4 the porthole is again illustrated by the numeral 3 and the ventilator represented generally by the numeral 2. The hollow casing 5 is provided with an opening 6' therein which is arranged adjacent the lowermost portion or bottom of the casing 5' whereas the exit opening 7' which communicates with the structure opening 3 is arranged thereabove whereby the air must travel upwardly within the casing from the inlet 6' to the discharge 7' which encourages falling out of any water which may be intermingled with or entrained in the air. A curved inner wall 9' and the deflector 10' are arranged so as to direct the air from the opening 6' upwardly in a curved path within the casing 5' to aid in discharging or separating water from the air by centrifugal force. It is to be noted that the end 14' of the deflector 10' is positioned in the casing so that water discharged tangentially off the surface 20 of the deflector at the end 14' will be directed downwardly so as to hit against the curved wall 9' which is sloped or slanted as illustrated at 21 in the direction of the opening 6' whereby the water may be discharged from the casing 5'. Any water which collects on the surface 22 may pass downwardly therealong to be discharged through the drain 23 in the end of the casing 5'. In the Fig. 4 modification the casing 5' is rectangular and the deflector 10' extends longitudinally between opposite ends of the casing.

It is to be noted that the path of the air from the opening 6' to discharge opening 7' is upwardly and that the air reverses its direction due to the arrangement of the deflector 10' above opening 6'.

Figs. 5 and 6 illustrate the preferred embodiment of the invention from a commercial point of view, because the casing comprises two half-sections 24 and 25, each of which sections have openings 26 and 27 therein respectively. The casing 5'' in the Figs. 5 and 6 modification is provided with flared portions or flanges 28 whereby suitable means such as screws or the like may engage the casing to the structure 4 so as to position it in relation to the opening 3. It will be noted that the opening 27 forms the inlet opening and the casing 5'' is positioned in relation to the opening 3 so that the inlet opening 27 is at the lowermost portion or the bottom of the casing 5''. The opening 26 forms the exit opening and is above the opening 27 whereby the air must travel upwardly through the casing 5'' to be discharged through the opening 3. The sections 24 and 25 include curved inner walls 30 and 31 which cooperate to guide the air in a curved path through the casing 5'' to aid in separating the water from the air by centrifugal force. The portion 32 of the section 25 forms a deflector, similar in function to the deflectors 10 and 10' of the Figs. 1 and 4 modifications respectively, whereby any water impinging on the deflector 32 and tangentially flowing therefrom will be directed against the surface 33 of section 24 which guides such water downwardly toward the inlet opening 27 to be discharged therethrough.

Also, in the Figs. 5 and 6 modification, the path of the air through the casing 5'' is reversed to further inhibit the entry of foreign matter such as water with the air through opening 3.

The relationship of the deflectors 10, 10' and 32 to the opposite surface 13, 21 and 33 respectively is such that when water from the deflector is guided against the surface, such surface will tend to guide the water away from the exit opening above the deflector.

If desired, louvers 35 may be positioned in the inlet opening of any of the modifications so as to further aid in eliminating the flow of water along with the air into the casing. The arrangement of the louvers may be in any desired manner to best cooperate with the arrange-

ment of the curved surfaces and deflector within the casing to aid in eliminating or separating any water which may flow into the casing.

Figs. 7, 8 and 9 illustrate a form of the invention which may be adapted for use on a skylight or hatch cover. In the form of the invention illustrated in Figs. 7, 8 and 9, the air is conducted into the casing in a predetermined manner, and its direction reversed to aid in separating any water from the air. In all three illustrations, the air must travel upwardly from the inlet to the outlet in the casing prior to discharge from the casing.

In Fig. 8, the hollow casing is illustrated at 5''', and is shown as being in the form of semi-sphere with an inlet opening 6''' on one side thereof and adjacent the bottom of the casing. The outlet 7''' is formed within the casing 5''' by means of an annular partition 37. The partition 37 is secured to casing 5''' around its periphery, and curves upwardly therefrom with the forward portion 38 thereof terminating in close relation to the casing 5''' above the inlet opening 6'''. The circular partition 37 is flared outwardly along part of its upper edge 40 as illustrated in the side view of Fig. 8 and is cut so that the rear portion 41' thereof is lower than the point of termination 38 of the forward part. The upper edge 40 of partition 37 extends in close proximity to the casing 5''' from the forward portion 38 rearwardly to approximately the point 41. The forward part 42 and rearward part 43'' of casing 5''' is thereby, in effect, separated. As air enters the inlet opening 6''', it must flow from the forward part 42 of casing 5''' around either side of the partition 37 and in the passage formed between the casing walls 5''' and the partition 37 to the rear part 43'' of the casing 5'''. This tends to separate any water from the air by centrifugal force and when the air gets beyond the point 41, it can then flow upwardly over partition 37 to exit 7'''.

Thus, in the Figs. 7 and 8 modification, air must travel in a curved path and then upwardly from the inlet before it can be discharged through the exit and into the hatch or skylight opening 3'. Water separated from the air may flow out the openings 43' spaced circumferentially about the bottom of casing 5''' at the rear thereof.

Fig. 9 illustrates still another modification of a hatch cover or skylight cover with the opening 6'''' positioned adjacent the bottom of the casing 5'''. The exit opening 7'''' is provided for discharging air to the hatch or skylight opening 3'.

Air entering opening 6'''' must travel upwardly over the deflector 45 before it can be discharged into the opening 7'''' on the other side thereof. A curved inner wall 46 in cooperation with the deflector 45 directs the air from the opening 6'''' in a curved path to tend to discharge water therefrom by centrifugal force. The casing wall 47 which is in opposed relation to the end of the deflector 45 is shaped so that water impinging thereagainst from the deflector will be guided back towards the opening 6''''.

If desired, louvers 35 may be provided in the form of the invention shown in Figs. 7, 8 and 9 for the purposes hereinabove discussed with relation to the Figs. 1, 4 and 5 modifications. The invention may assume any configuration while maintaining the structural arrangement and relationship of the inlet opening and the exit opening as well as the relationship of the curved surfaces within the casing to the deflector and inlet opening and exit opening respectively. Figs. 1-3 illustrate the invention as being generally of a cylindrical configuration and Fig. 4 shows a section of a form which may be of oblong configuration. Figs. 5 and 6 also show the configuration as being oblong or rectangular. Figs. 7, 8 and 9 illustrate the invention as being in the general form of a semi-sphere.

However, all of such constructions have in common the general arrangement wherein the inlet to the casing is below the outlet so that the air must travel upwardly

within the ventilator prior to discharge therefrom. All of the constructions include curved walls or surfaces which direct the air from the inlet in a curved path to aid in separation of any water from the air by centrifugal force. All of such drawings illustrate a deflector which cooperates with the inner wall that directs the air in a curved path to reverse the direction of the flow of air prior to discharge thereof from the ventilator so as to further aid in separating any water from the air.

It is further noted that all of such ventilators are provided with surface walls in opposed relation to the end of the deflector which walls are constructed and arranged so as to guide any water directed thereagainst by the deflector towards the inlet opening and away from the exit opening.

The modifications may be formed of plastic so as to admit light through the opening that they are covering. Also it should be noted that while flanges 28 are shown whereby the casings may be positioned over the openings, any suitable means may be used for securing the invention in position over the opening 3.

Broadly the invention relates to a ventilator for use on skylights and ports or hatch openings on boats or in similar situations where it is desired to admit air while excluding water.

What is claimed is:

1. A ventilator for an opening in a structure comprising, a substantially closed hollow casing, means for securing said casing in position over the structure opening, there being an air admitting opening adjacent the bottom of said casing, said casing having an inner surface extending upwardly and inwardly from the lower edge of said air admitting opening for guiding the air received from said casing air admitting opening, said casing having an additional sloping inner surface on the side opposed from said first named inner surface, an outlet opening in said casing, said opposed inner surface terminating adjacent said outlet opening and extending between said outlet and air admitting opening for communicating said air admitting and outlet openings in said casing, an air deflector mounted between said air admitting and outlet openings and projecting toward said opposed inner surface but terminating in spaced relation thereto whereby water directed off said deflector will strike against said opposed inner surface and flow towards said air admitting opening in said casing.

2. A ventilator for an opening in a structure comprising, a substantially closed hollow casing, means for securing said casing in position over the structure opening, there being an air admitting opening adjacent the bottom of said casing, said casing having an inner surface extending upwardly and inwardly from the lower edge of said air admitting opening for guiding the air received from said casing air admitting opening, said casing having an additional sloping inner surface on the side opposed from said first named inner surface, an outlet opening in said casing above said air admitting opening, said opposed inner surface terminating adjacent said outlet opening and extending between said outlet and air admitting opening for communicating said air admitting and outlet openings in said casing, an air deflector mounted between said air admitting and outlet openings and projecting toward said opposed inner surface but terminating in spaced relation thereto whereby water directed off said deflector will strike against said opposed inner surface and flow towards said air admitting opening in said casing.

3. The combination recited in claim 1 wherein said casing is formed of two half-sections.

4. The combination recited in claim 2 wherein said casing is formed of two half-sections.

5. The combination recited in claim 1 wherein said securing means includes a flange in said casing, and means for positioning said flange on the structure.

6. The combination recited in claim 2 wherein said securing means includes a flange on said casing, and means for positioning said flange on the structure.

References Cited in the file of this patent

UNITED STATES PATENTS

813,737	Ralston	Feb. 27, 1906
1,028,160	Herdman	June 4, 1912
1,369,099	Hanson	Feb. 22, 1921
1,568,373	Ford	Jan. 5, 1926
1,975,316	Ferris	Oct. 2, 1934
2,286,584	Simcox	June 16, 1942
2,476,368	Guernsey	July 19, 1949
2,550,353	Hopfinger	Apr. 24, 1951
2,711,126	Atkinson	June 21, 1955

FOREIGN PATENTS

470,675	Germany	Jan. 21, 1929
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