Jan. 13, 1942. T. C. FOWLER 2,269,656

PUTTYLESS VENTILATED SKYLIGHT

Filed Feb. 8, 1940 2 Sheets-Sheet 1

FIG. 1.

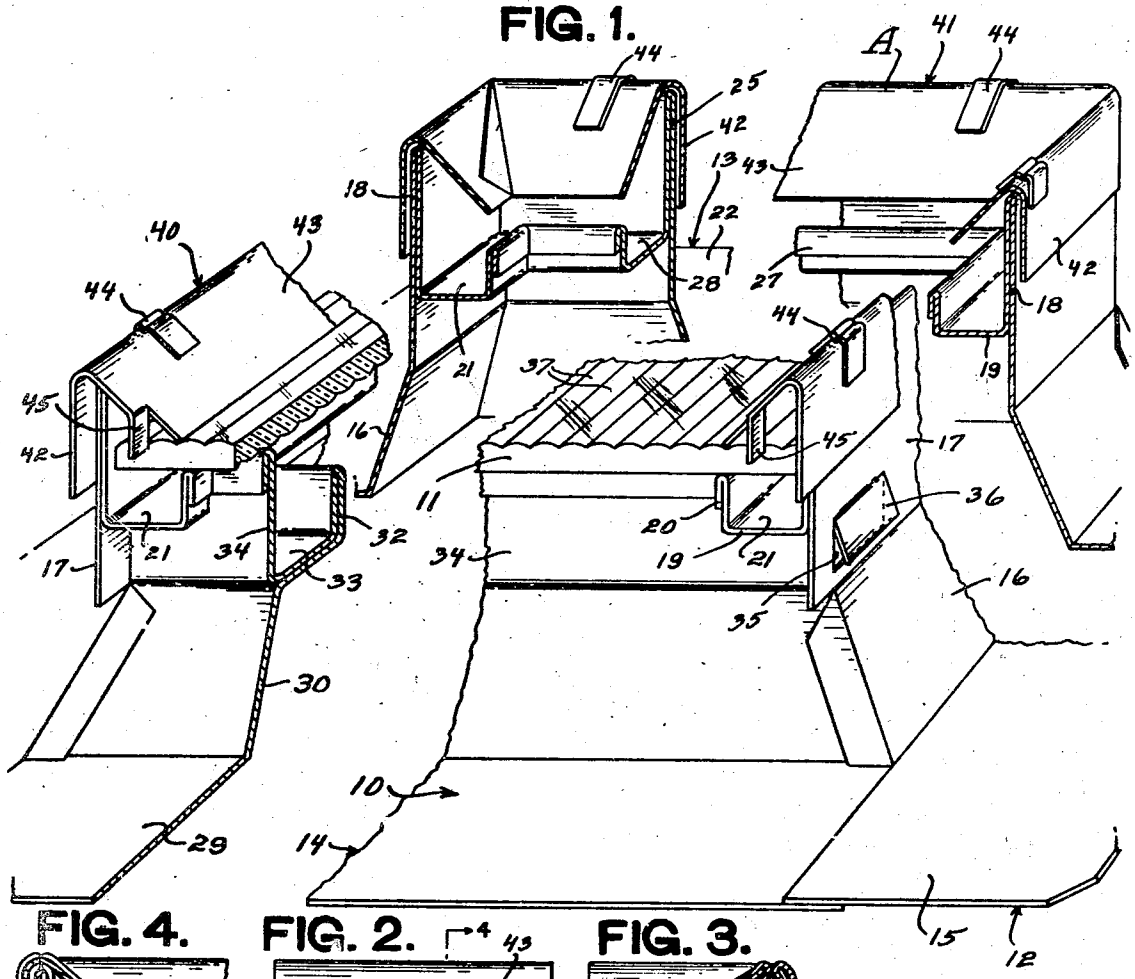


FIG. 4.

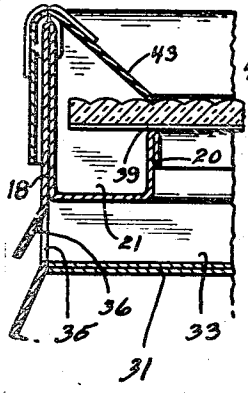


FIG. 2.

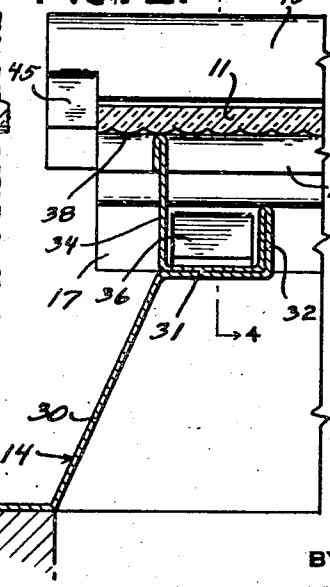
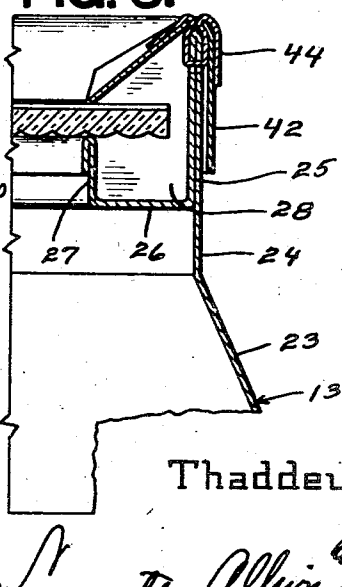


FIG. 3.



INVENTOR.
Thaddeus C. Fowler

BY Lancaster, Allwine & Rommel
ATTORNEYS.

Jan. 13, 1942. T. C. FOWLER 2,269,656

PUTTYLESS VENTILATED SKYLIGHT

Filed Feb. 8, 1940 2 Sheets-Sheet 2

FIG. 5.

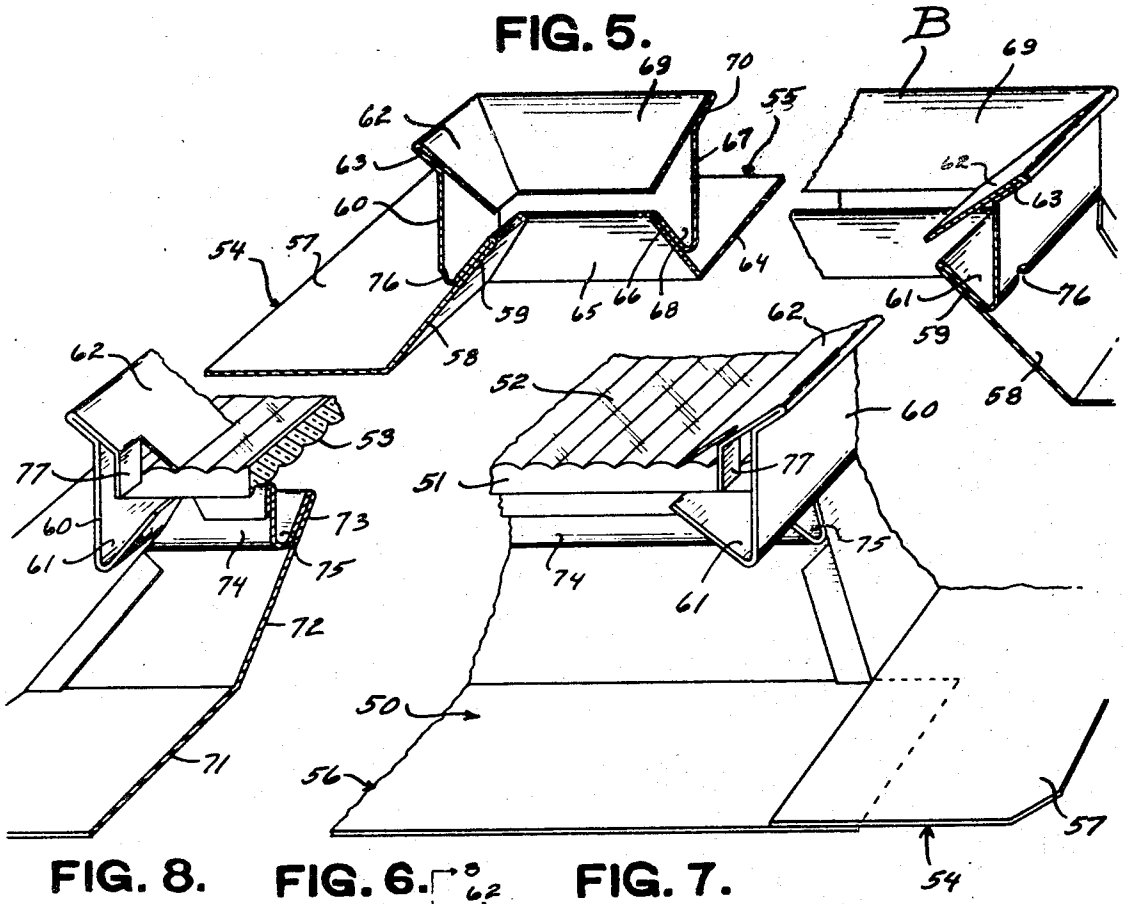


FIG. 8.

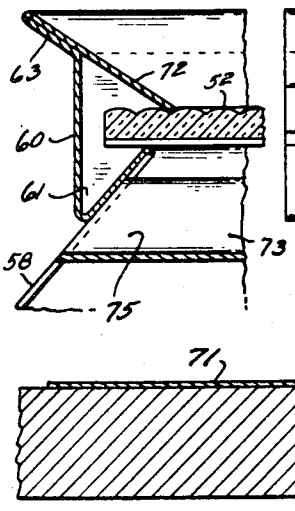


FIG. 6.

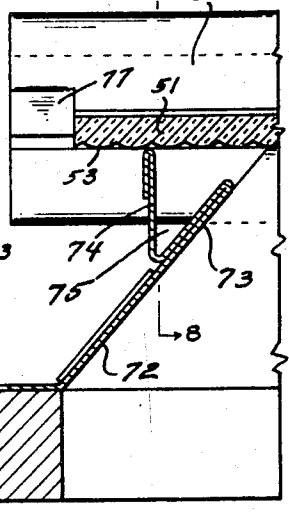
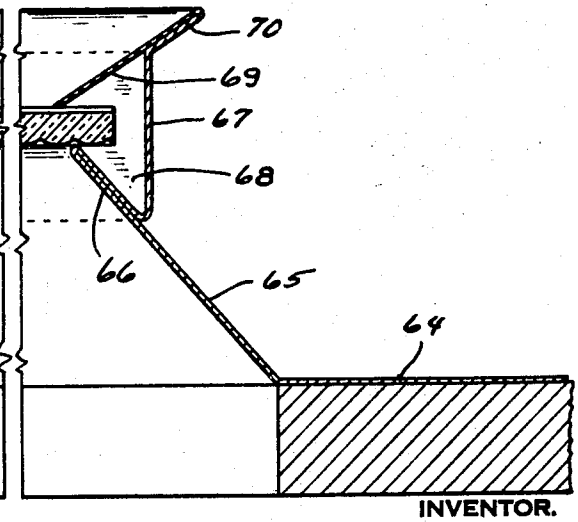


FIG. 7.



INVENTOR.

Thaddeus C. Fowler

BY Lancaster, Allwine and Rommel

ATTORNEYS.

Patented Jan. 13, 1942

2,269,656

UNITED STATES PATENT OFFICE

2,269,656

PUTTYLESS VENTILATED SKYLIGHT

Thaddeus C. Fowler, Huntington, W. Va.

Application February 8, 1940, Serial No. 317,943

8 Claims. (Cl. 108—16)

The present invention relates to skylight constructions and the primary object of the invention is to provide a puttyless ventilated skylight which will be leakproof and wherein a circulation of air is permitted so as to eliminate condensation.

A further object resides in the improved gutter arrangement and relationship of the glass panel to the metal frame which not only provides for proper ventilation and greater lighting efficiency, but also avoids excessive delivery of water to the side gutters.

A further object resides in the improved manner of mounting the glass panel so as to prevent breakage, and the means for retaining the panel in place.

A further object resides in the novel gutter arrangement providing a support for the glass panel in such a manner as to permit air to circulate freely about the edges of the glass so that sweating is eliminated.

A still further object is to provide a skylight frame which may be economically produced from sheet metal and readily applied to a roof without requiring the usual flashed curbing as now generally employed.

A still further object resides in the arrangement whereby a clean wash-out is provided for the gutters so as to take care of any excess accumulation of water without any likelihood of the gutters overflowing.

A still further object resides in the novel manner of forming the gutters integral with the side and end members of the skylight frame whereby the gutters provide supports for the edge portions of the glass panel.

Other objects and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings forming a part of this specification and in which drawings:

Figure 1 is a broken away perspective view showing only the four corner portions of the skylight, the view being one looking at the lower end of the skylight.

Figure 2 is a vertical fragmentary section thru the lower end portion of the skylight.

Figure 3 is a vertical fragmentary section thru the upper end portion of the skylight.

Figure 4 is a vertical fragmentary section on the line 4—4 of Figure 2.

Figure 5 is a broken away perspective view showing only the four corner portions of a slightly modified form of skylight.

Figure 6 is a vertical fragmentary section thru the lower end portion of the skylight shown in Figure 5.

Figure 7 is a vertical fragmentary section thru the upper end portion of the skylight shown in Figure 5.

Figure 8 is a vertical fragmentary section on the line 8—8 of Figure 6.

In the drawings, wherein like reference characters designate corresponding parts thruout the several views, the letter A may generally designate the form of the invention disclosed in Figures 1 to 4, while the letter B may designate the form of the invention disclosed in Figures 5 to 8.

Referring first to the skylight construction A shown in Figures 1 to 4 inclusive, the same comprises an open sheet metal frame designated as a whole by the numeral 10 and in which is mounted a glass panel 11. The frame 10 may either be square or rectangular in shape, while the glass panel 11 is of such construction as to provide for ventilation and an even distribution of light over a large area as will be later described.

The frame 10 comprises a pair of side sections 12, an upper end section 13, and a lower end section 14 all of which are formed of sheet metal and suitably secured together at their end portions as by soldering, welding or any other preferred manner. The side sections 12 are each formed with a flat base or mounting flange 15 having an upturned inwardly inclined flashing wall 16 along its inner edge. Extending upwardly from the upper edge of the wall 16 is a vertical side wall 17 which is folded or doubled inward upon itself into a closed fold 18 from which extends inwardly a horizontal portion 19 having an upturned flange 20 along its inner edge forming a side gutter 21 extending along the inner side and thruout the length of the side wall 17. The upper or fold edge of the wall 17 extends above the upper edge of the flange 20 so that the gutter 21 is substantially J-shape in cross section.

The upper end section 13 is substantially similar in formation to that of the side sections 12 and embodies a flat base or mounting flange 22 having an inwardly inclined flashing wall 23 along its inner edge. The vertical wall 24 is folded inward upon itself into a closed fold 25 from which an inwardly extending horizontal portion 26 extends and is provided with an upturned flange 27 forming an upper end gutter 28 along the inner side of and extending thruout the length of the wall 24. This end gutter 28 is also of J-shape in cross section and communicates at its ends with the upper ends of the side gutters 21, as clearly shown in Figure 1.

The lower end section 14 is formed with a flat base or mounting flange 29 having an upturned inwardly inclined flashing wall 30 along its inner edge. From the upper end of the wall 30, the sheet metal is doubled upon itself to form an inwardly extending horizontal portion 31 having an upturned flange 32 along its inner edge forming a lower end gutter 33. At the outer edge of the gutter 33 the sheet metal extends upward providing a vertical supporting flange or outer gutter wall 34. As shown particularly in Figures 1 and 2, the gutter wall 34 is inwardly spaced from the lower ends of the side walls 17, with the upper edge of the wall 34 aligning with the upper edge of the flanges 20 of the side gutters 21. The lower ends of the side gutters 21 do not communicate with the lower end gutter 33, but extend above this gutter, and project thru the outer gutter wall 34 whereby any water collected in the gutters 28 and 21 may readily drain from the open ends of the side gutters 21 upon the roof. The ends of the lower end or condensation gutter 33 extend to the side walls 17 of the side sections 12 and drain openings 35 are formed in the side walls 17 in alignment with the ends of the gutter 33 by striking out louvres 36 which act as shields for the openings 35. Thus any water collected in the gutter 33 will drain from the openings 35 directly upon the roof. The ends of the gutter 33 are of course, soldered or otherwise secured by a leakproof connection to the side walls 17.

The gutter flanges 20 and 27, together with the outer wall 34 of the gutter 33 have their upper edges in aligning relation and form supporting flanges for the glass panel 11 which is of such construction and so associated with the supporting flanges as to permit free circulation of air about the edge portions of the panel whereby sweating is reduced to a minimum. The glass panel 11 is of a construction designed to provide maximum light diffusion and is ribbed on each side, with the ribs 37 on the upper side of the glass disposed at right angles to the ribs 38 on the lower side of the glass. The glass panel is arranged in the frame 10 with the upper ribs 37 parallel to the side gutters 21 so that these ribs run or extend in the direction of fall of the skylight. The crowns of the ribs 38 on the under side of the glass rest upon the upper edges of the side gutter flanges 20 and form a series of small air spaces 39 along the upper edges of the flanges 20 for circulation of air beneath the glass. As shown in Figures 3 and 4, the side and upper end edges of the glass panel are spaced from the metal frame to allow for expansion of the glass without danger of breaking. As shown in Figure 2, the lower end of the glass extends beyond the outer wall 34 of the gutter 33 and terminates flush with the lower edges of the side walls 17.

Disposed over the upper edge of each side wall 17 is a retaining cap 40, while disposed over the upper edge of the end wall 24 is a retaining cap 41 which serves to yieldably retain the glass panel 11 in place. These caps 40 and 41 are of substantially inverted V-shape providing a vertical skirt flange 42, and an inclined bearing flange 43 for yieldably engaging the upper side of the glass 11. These caps 40 and 41 are secured in place by means of sheet metal strips 44 having their central portions passed thru openings cut in the folds 18 and 25 for the respective caps and then passed upward thru slots cut in the apex of the caps. The ends of the strips 44 are then turned down over the flanges 42 and 43 for securing the caps in place with the lower edges of the bearing flanges yieldably engaging the glass panel 11 in substantially overlying relation to the gutter flanges 20 and 27. The caps 40 and 41 are removable independent of one another and are not connected at their meeting ends.

As shown in Figures 1 and 2, the lower ends of the caps 40 extend beyond the lower edge of the glass 11, and the bearing flanges 43 are slit to form a retaining lug 45 which is bent or turned down over the lower edge of the glass so as to prevent the glass from sliding out of the frame 10.

Since the flange 32 of the lower end gutter 33 is spaced from the lower side of the glass 11, this gutter 33 serves not only as a means for collecting any condensation which may collect on the under side of the glass, but also permits circulation of air for reducing condensation.

Referring now to the form of skylight B shown in Figures 5 to 8 inclusive, many of the salient features embodied in this form of the invention will also be found embodied in the skylight construction A. The skylight B comprises an open sheet metal frame 50 in which is mounted a glass panel 51 of like construction as that of the panel 11, the panel 51 having ribs 52 on its upper side which are disposed at right angles to ribs 53 on the lower side of the glass. The upper ribs 52 run or extend in the direction of fall or pitch of the skylight.

The frame 50 is of four-piece construction, comprising a pair of side sections 54, an upper end section 55, and a lower end section 56 suitably secured together at their end portions as by soldering, welding or the like. The side sections 54 are each formed with a flat base or mounting flange 57 at the inner edge of which is an upturned inwardly inclined flashing wall 58 which is doubled or folded outwardly upon itself at the upper portion into a closed fold forming a supporting flange 59. Extending upwardly from the lower edge of the flange 59 is a vertical side wall 60 which extends above the upper edge of the flange 59 and co-acts with the latter to form a V-shaped side gutter 61 disposed outwardly of the flashing wall 58. Formed along the upper edge of the vertical wall 60 is an inclined bearing flange 62 which extends inwardly and downwardly over the gutter 61 with its lower edge adapted to yieldably engage the upper side of the glass panel 51. The upper or fold edge of the flange 62 projects outwardly of the wall 60 and forms a lip 63.

The upper end section 55 is substantially similar to the side sections 54, embodying a flat base flange 64 formed with an upwardly and inwardly inclined flashing wall 65 along its inner edge which is doubled outwardly upon itself at the upper portion to provide a supporting flange 66. A vertical side wall 67 extends upwardly from the lower edge of the flange 66 and co-acts with the latter to form a V-shaped upper end gutter 68 disposed outwardly of the flashing wall 65. The ends of this gutter 68 communicate with the upper ends of the side gutters 61. An inclined bearing flange 69 along the upper edge of the wall 67 extends inwardly and downwardly over the gutter 68 for yieldably engaging the glass panel 51. A lip 70 projects outwardly of the wall 67. The meeting edges of the bearing flanges 62 and 69 are not secured together and permit independent yielding of the flanges. As shown, the upper edges of the supporting flanges 59 and 66 align and form a support for the upper and side portions of the panel 51.

The lower end section 56 embodies a flat base

flange 71 having an upwardly and inwardly inclined flashing wall 72 along its inner edge which is doubled or folded outwardly upon itself along the upper portion to form a gutter flange 73 having its upper edge disposed below the plane of the upper edges of the supporting flanges 59 and 66. Extending upwardly from the lower edge of the flange 73 is a vertical side wall 74 which extends above the upper edge of the flange 73 and co-acts with the latter to form a V-shaped lower end gutter 75 disposed outwardly of the flashing wall 72. The upper edge of the side wall 74 extends flush with the upper edges of the flanges 59 and 66 and forms a supporting flange for the lower portion of the glass 51.

As shown particularly in Figures 5 and 6, the side gutters 61 together with the bearing flanges 62, extend beyond the outer wall 74 of the lower gutter 75 and the ends of the gutter 75 do not communicate with the side gutters 61. The bottom of the gutter 75 is below the bottom of the side gutters 61 whereby any water collected in the gutter 75 will drain from the open ends of the gutter 75 directly upon the roof. To allow for mounting the skylight B upon a substantially flat roof, the side gutters 61 may be provided with suitably spaced weep holes 76 which not only serve to permit water to drain from the intermediate portion of the gutters but also permit a circulation of air for preventing condensation forming on the glass panel 51.

The lower end of the glass 51 extends beyond the lower gutter wall 74 but terminates short of the lower end of the bearing flanges 62. The lower ends of the flanges 62 are slit to form retaining lugs 77 which are bent or turned down over the lower edge of the glass panel 51 for retaining the glass in place in the frame 50.

Thus, in both forms of the invention, the construction is such as to permit ventilation and eliminate dripping due to sweating. The gutter arrangement is such as to eliminate flooding of the lower gutter since the side gutters do not discharge to the lower gutter but have a clean wash-out directly upon the roof. The integrally formed gutters provide for economical construction of the skylight frame, as well as reinforcing the upper portion of the frame. Since the bearing flanges 43 or 62 have yieldable contact along one edge with the glass panel, panels of different thicknesses may be placed in the frame and the pressure exerted by the bearing flanges easily varied by merely springing the flanges as is believed will be readily apparent.

Changes in detail may be made to the forms of the invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. A puttyless ventilated skylight comprising an open frame unit provided with marginal gutters each having an upstanding supporting flange, a glass panel unit resting on the supporting flanges, one of said units having a series of recesses at the zone where the glass panel unit rests on said supporting flanges of the frame unit, forming a series of small air spaces at the under side of the panel along the upper edges of the flanges, and a yieldable retaining flange engaging the upper surface of the panel at the sides and one end of the frame.

2. A skylight comprising a frame including side sections and upper and lower sections, an upper gutter across the upper section embodying a supporting flange having a straight upper edge, a side gutter along each side section communicating with the ends of the upper gutter and each embodying a supporting flange having a straight upper edge, said side gutters opening thru the lower section, a lower gutter across the lower section beneath the side gutters and embodying a supporting flange, said lower gutter opening at its ends at the side sections, a ribbed glass panel resting on the straight upper edges of said supporting flanges and having ribs disposed in right angular relation on opposite sides thereof with the ribs on the under side of the panel extending transversely of the side gutters and providing a series of air spaces along the straight upper edges of the side flanges, and a bearing flange on the side and upper end sections for yieldably urging the panel down upon the supporting flanges.

3. A puttyless skylight comprising an open frame having a gutter about its sides and upper end, a lower gutter across the lower end of the frame, a glass panel having a ribbed under side seating on the gutters and having its lower edge extending beyond said lower gutter, bearing flanges engaging the panel above the gutters at the sides and upper end of the frame and extending beyond the lower edge of the panel, and a retaining lug bent from the ends of the bearing flanges at the sides of the frame to extend over the lower edge of the panel for securing the panel in the frame.

4. A skylight comprising a frame including side and upper and lower end sections, said sections each having a gutter formed along its inner side with the gutters along the side sections communicating at one end with the ends of the gutter along the upper section and at their other ends opening thru the lower section, and the gutter along the lower section being disposed below the side gutters and opening thru drain openings in the side sections below the side gutters, a louver struck from each side section and shielding the drain openings, and a glass panel secured in place resting upon said gutters, said panel having an irregular under surface at its zones of contact with the gutters.

5. In a skylight, a frame including side and upper and lower end sections, an upper gutter formed along the upper end section, a side gutter formed along each side section and communicating at one end with the ends of the upper gutter, said upper and side gutters each having a supporting flange along the inner edge thereof, a lower gutter formed along the lower end section to extend beneath the side gutters, said lower gutter having a supporting flange along its outer edge aligning with the supporting flanges of the upper and side gutters and a flange along its inner edge of less height than the supporting flange, said side gutters opening at one end thru the lower end section, and the lower gutter opening at its ends thru the side sections of the frame, a ribbed glass panel supported on said flanges, and yieldable retaining means for the panel.

6. In a skylight construction, an open frame comprising side sections and upper and lower end sections, a V-shaped side gutter formed along the outside of each side section and opening at the lower end of the frame, spaced apart weep holes provided in the bottom of each side gutter, a V-shaped upper gutter formed along the outside of the upper section and communicating at its ends with the upper ends of the side gutters, a V-shaped lower gutter formed

along the outside of the lower section below the side gutters and opening at its ends at the sides of the frame, said gutters each providing a supporting edge, a ribbed glass panel resting on the supporting edges, and means for retaining the glass panel in place resting on said edges of the gutters.

7. In a skylight construction, a one piece sheet metal frame section comprising a flat base flange, an inclined flashing wall extending upwardly and inwardly from the inner edge of the base flange, a side wall extending vertically from the flashing wall and doubled inward and downward upon itself at its upper portion, a horizontal wall extending inward from the downturned wall portion, and an upstanding supporting flange extending upward from the horizontal wall and terminating below the upper edge of the side wall, a glass panel having a ribbed under side resting on the upper end of said supporting flange and providing a series of air spaces therealong, and a retaining flange engaging the upper side of the glass panel in substantial alignment above the supporting flange.

8. In a skylight construction, a one piece sheet metal frame section comprising a flat base flange, an inclined flashing wall extending upwardly and inwardly from the inner edge of the base flange and doubled outward and downward upon itself at its upper portion, a vertical side wall extending upward from the downturned flashing wall portion and extending above the upper edge of the flashing wall, and a lip inclined outwardly from the upper edge of the side wall and doubled inwardly upon itself forming a bearing flange extending inwardly beyond the side wall and terminating in substantial alignment above the upper edge of the flashing wall, and a ribbed glazing panel disposed between the upper end of said flashing wall and the lower end of said bearing flange with the crowns of the ribs resting on the former to provide a series of small air spaces therealong to permit ventilation of the skylight.

THADDEUS C. FOWLER.