June 20, 1967 D. P. JOHNSON 3,325,951

ADJUSTABLE SKYLIGHT

Filed July 13, 1964 2 Sheets-Sheet 1

Fig-1

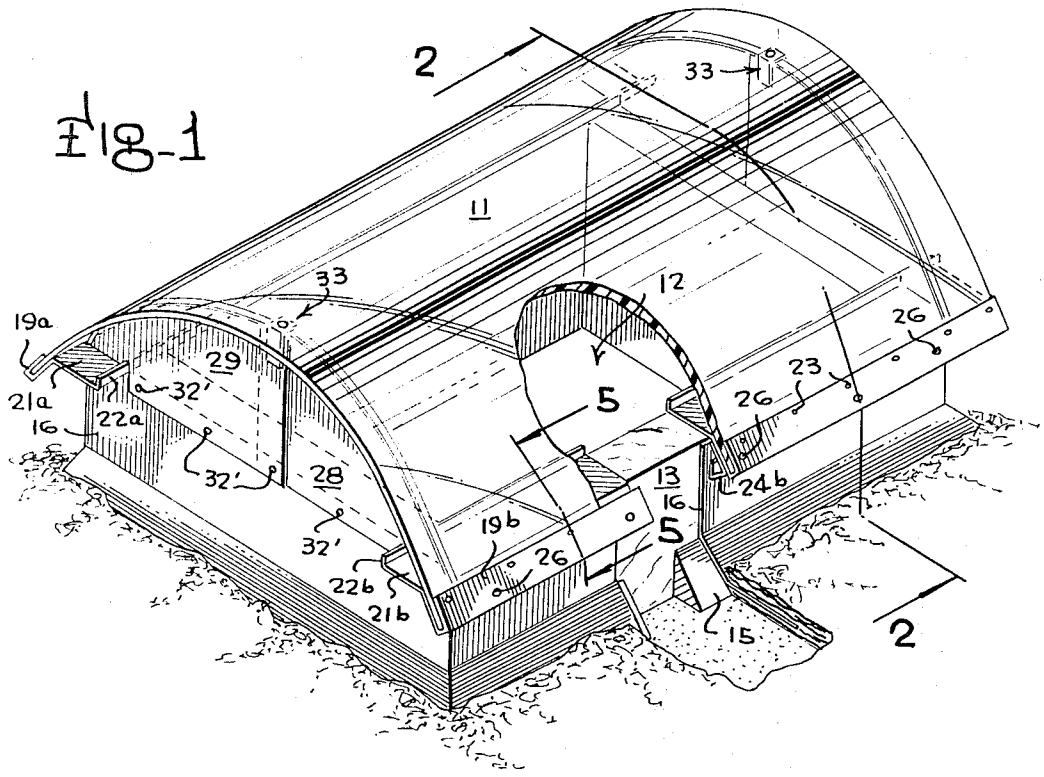
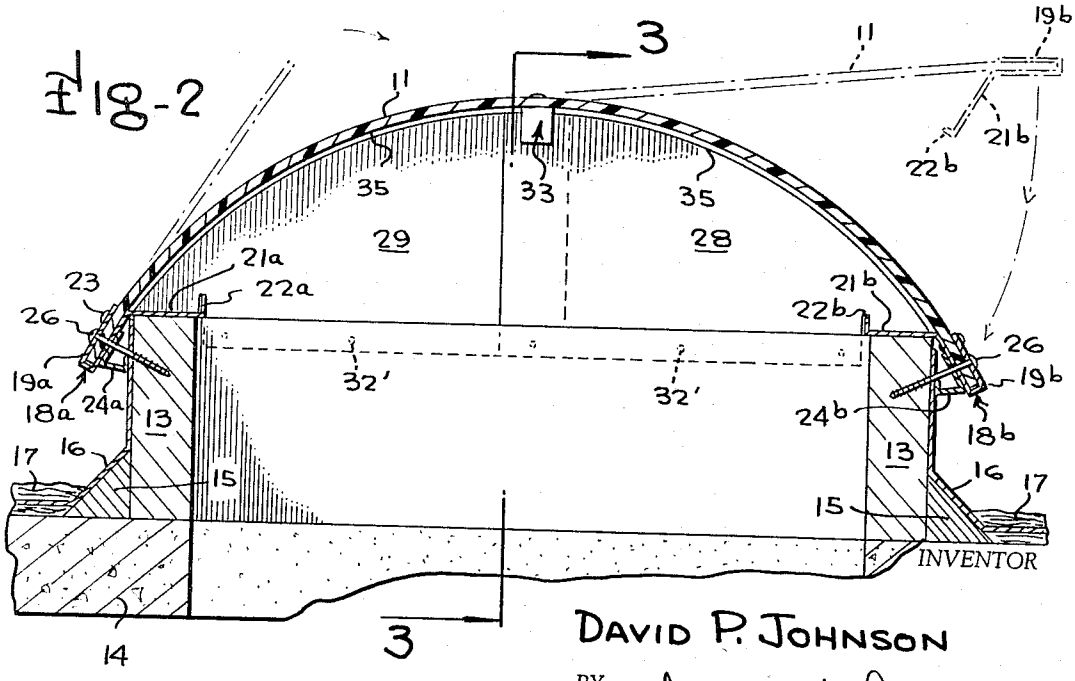


Fig-2



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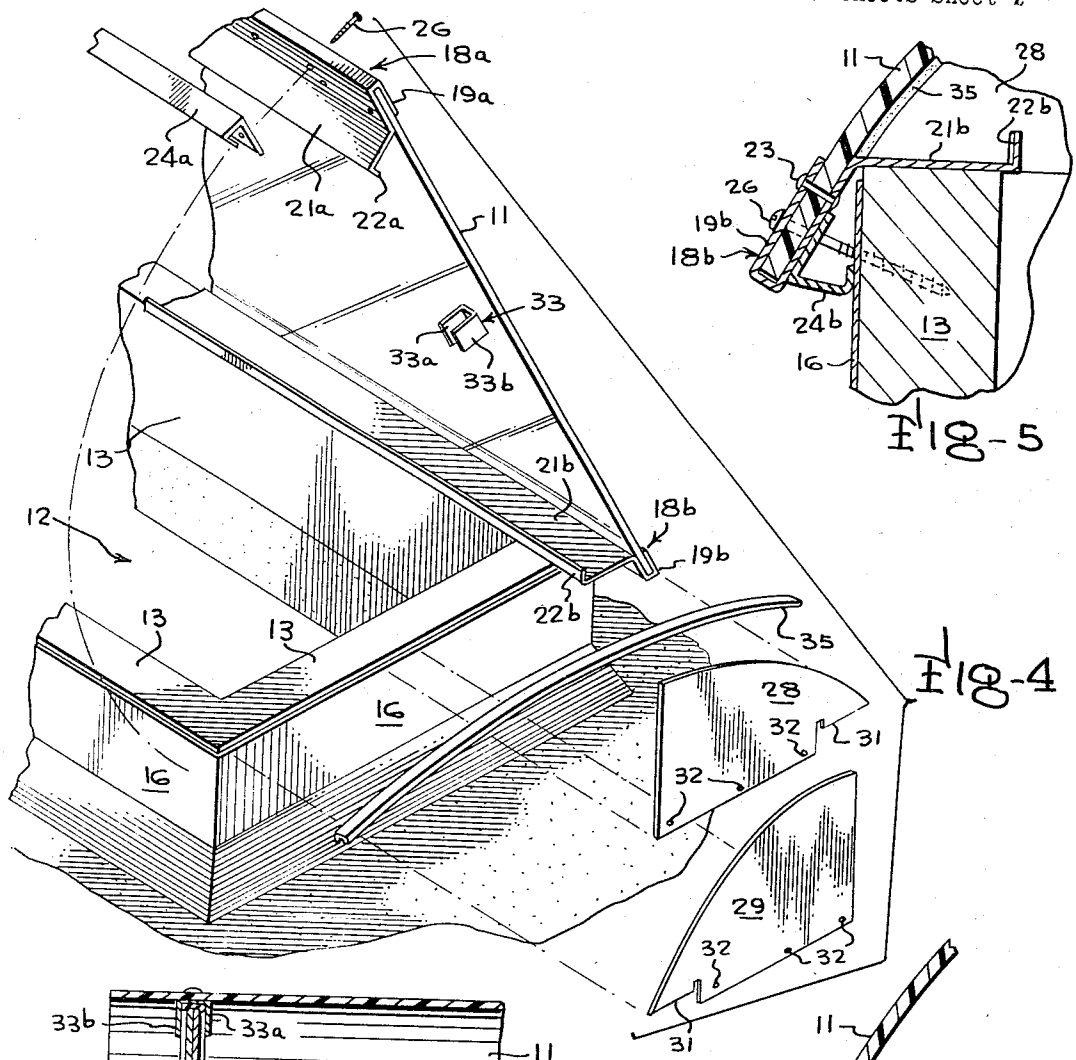


FIG-4

FIG-5

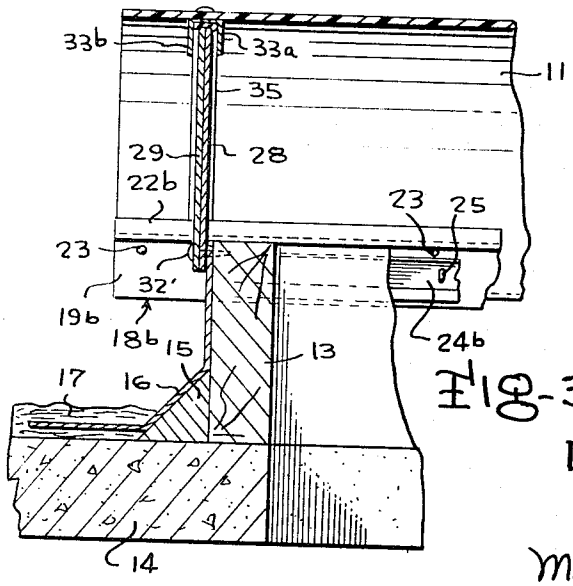


FIG-3

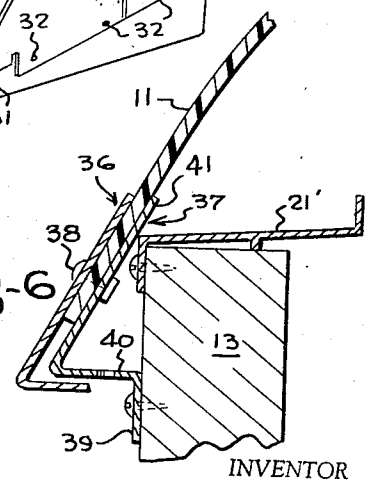


FIG-6

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3,325,951

ADJUSTABLE SKYLIGHT

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8 Claims. (Cl. 52—86)

This invention relates generally to skylights and more particularly to a novel flexible skylight construction capable of fitting roof openings of a range of sizes with a skylight cover member of but one size.

A major problem encountered in the building industry with the construction of skylights on buildings is that while a certain size of skylight may be specified in the building plans, when it becomes time to install the rigid frame skylight a proper fit cannot be obtained. In most cases the roofing contractor is called on to finish the skylight construction after the roof opening has been already provided with the associated skylight curb in place. Generally the building contractor will install the curb with its outer measurements corresponding to those called for in the finished skylight construction. When the roofing contractor arrives upon the job the skylight opening must have normal roof flashing installed around the periphery of the curb and secured to the roof in the normal manner to provide the necessary weatherproofing. However, after the flashing has been installed the outer measurements of the curb have grown somewhat larger than the measurements specified for the entire skylight. With this in mind it is obvious that a rigid-frame skylight will not possibly fit upon the oversized curb, and when this happens the roofing contractor is forced to remove the curbing and reconstruct it.

Therefore, an object of this invention is the provision of an adjustable skylight which may be adjusted for proper size to fit a finished roof skylight opening.

Another object of this invention is the provision of an adjustable skylight having a flexible transparent cover member that may be shaped to a desired curvature at the time it is installed about a finished roof skylight opening.

Another object of this invention is the provision of skylight having adjustable end closure panels to mate with various arched cover member curvatures thereby providing a weather tight construction.

A still further object of this invention is the provision of a skylight having a flexible transparent cover member and adjustable end closure panels which may be easily placed upon a prepared roof opening in addition to having the necessary qualities of being simple in manufacture, of low cost and providing ease of transportation.

Other objects, advantages and capabilities of the invention will become apparent from the following description, taken in conjunction with the accompanying drawings showing only a preferred embodiment of the invention.

In the drawings:

FIGURE 1 is a perspective view of a skylight contemplated in the present invention with parts of the skylight broken away to illustrate the internal arrangement thereof;

FIGURE 2 is a section view of the skylight taken on lines 2—2 of FIGURE 1;

FIGURE 3 is a partial vertical section view of the skylight taken on lines 3—3 of FIGURE 2;

FIGURE 4 is a partial exploded perspective view of the skylight with portions broken away showing especially the relationship of the side closure panels with respect to other parts of the structure;

FIGURE 5 is a partial section view showing only the details of the juncture of the flexible skylight with the curb taken on lines 5—5 of FIGURE 1; and

FIGURE 6 is a fragmentary section view similar to FIGURE 5 but illustrating a modified construction.

Referring to the drawings wherein like reference characters designate corresponding parts throughout the several figures, the skylight of the present invention is denoted generally by the reference character **10**. The skylight **10** comprises a flexible plastic sheet material cover member **11** which is preferably a thermal plastic acrylic resin of clear or white translucent properties to allow the desired amount of light to enter through the skylight. The flexible cover member **11** should obviously be of such thickness and strength to support a designed load without the possibility of failure. The skylight **10** is adapted to be placed over a roof opening generally indicated by numeral **12** about which is formed a curb **13** on all sides to permit the skylight **10** to be placed thereon. At the juncture of the curb **13** with the roof structure **14** is an elongated triangular shaped cant strip **15** which provides a proper slope immediately adjacent the curb **13** to permit the rapid dispersal of moisture that may tend to collect upon the roof about the skylight **10**.

As is normal, roof flashing **16** is placed about the entire periphery and external face of curb **13** and extended in a unitary manner over the cant strip **15** and then extended generally parallel to the roof structure **14** a sufficient distance to be integrated into the roof structure itself. Normally the flashing **16** is integrated to the roof structure **14** by a composition roofing material or in some cases by built-up roofing material **17** which provides complete weatherproofing qualities to the juncture of the flashing **16** with the roof structure **14**.

Affixed to the flexible cover member **11** along two opposite edges are unitary condensation gutter and support frames, generally indicated by numerals **18***a* and **18***b*, each of which are identical in construction. The combination gutter and support frames **18***a*, **18***b* are each formed of elongated U shaped channel members **19***a*, **19***b* having parallel legs which flank both surfaces of the cover member sheet **11** for a distance adjacent the ends thereof and encompass the adjacent edge of the sheet material **11**. Extending inwardly toward the center of the skylight from the inner leg of the U shaped channel members **19***a*, **19***b* are condensate gutters **21***a*, **21***b* having at their free ends an upturned gutter lip **22***a* and **22***b* to provide a trough shaped cross-section so as to maintain any accumlated condensate within the gutter. The combination condensate gutter and support frames **18***a*, **18***b* are secured to the cover member **11** by suitable fasteners **23** which preferably are rivits extending through the sheet material **11** and both sides of the U shaped channel members **19***a*, **19***b*.

To provide the angular disposition of the channel members **19***a*, **19***b* and to help provide the correct curvature to the skylight flexible sheet cover member **11**, there are provided spacers **24***a*, **24***b* of truncated wedge shaped configuration, each of which will have a length normally extending to the outside measurement of the adjacent curb **13**. Each spacer **24***a*, **24***b* has a plurality of elongated screw slots **25** which provide the spacers with the ability to be adjusted vertically with respect to the curb **13** in order to provide the desired curvature to the cover member **11** in a manner to be discussed hereinafter.

The flexible sheet cover member **11** and the spacers **24***a*, **24***b* are affixed to the curb **13** by means of suitable screw fasteners **26** which project through suitably registered apertures in both legs of the U shaped channel members **19***a*, **19***b* and adjacent portions of cover member **11** lying within the support frames. In addition, the screws **26** also project through the elongated screw slots **25** in spaces **24***a*, **24***b* and thence into the curb **13** to securely fasten the cover member **11** thereto.

Once the cover member **11** is in place and curved to a degree sufficient for the skylight **10** to perform its intended function, the open segment-shaped areas between the lateral edges of the arched cover member **11** and the portion of curb **13** that lies immediately beneath must be closed to complete the skylight. To close these lateral open segment areas, there is provided for each such open segment area an adjustable side closure **27** of generally circular segment configuration formed of a pair of relatively adjustable closure halves **28, 29**. The base of each closure half is provided with a cut-way portion **31** which is designed to closely fit about the condensate gutters **21***a*, **21***b*. Along the bottom edge of the closure halves are located a plurality of screw apertures **32** through which screw fasteners **32'** are inserted to secure the closure halves to the curb **13** at such time as proper fit is obtained between closure halves and the cover member **11**. To maintain the closure halves **28** and **29** in fixed relation with the cover member **11**, a U shaped end closure cleat **33** is affixed to the interior of the cover member **11** and located near each side of the arched cover member whereby the closure halves **28, 29** are held against lateral displacement relative to the cover member **11** by the downwardly projecting arms **33***a*, **33***b* of the cleat which are adapted to flank the closure halves when in place.

The closure halves **28, 29** are designed so that when the skylight is in place over a roof opening and curbing of correct size, there will be a certain amount of overlap between the closure halves at the center of the segment shaped side openings. However, the degree of overlap of the end closure halves **28, 29** depends directly upon the amount of arch in the cover member **11** which in turn varies directly with the finished size of the roof opening and the curbing placement.

The procedure for installing the present skylight upon already installed curbing is to place one end of the cover member **11** upon the curb **13** in the proper manner as has been described. For the purpose of the description let it be assumed that the first end of the cover member **11** to be placed in position is the end having integral therewith the combination condensate gutter and support frame **18***a*. The gutter **21***b* would first be placed upon the top face of curb **13** and positoned as far inwardly toward the skylight opening as possible so that the juncture of the gutter **21***b* and the U shaped channel member **19***a* lies adjacent the outside peripheral edge of the curb **13**. At this point, the spacer **24***a* is inserted between the support frame **18***a* and curb **13** in the manner more fully shown in FIGURES 2 and 5. To firmly mount the combination gutter and support frame **18***a* in position, the screws **26** are inserted through their respective apertures within the support frame **18***a* and the registered apertures in the cover member **11** and thence inserted through the elongated screw slots **25** of the spacer **24***a*. The screws **26** would then be driven into the curb **13** to a point where sufficient looseness is left so that spacer **24***a* may be later positioned in the plane to give the degree of arch to the cover member **11** that may be needed.

When the one end of the cover member **11** is fastened in position, it is merely necessary to flex the cover member **11** in the manner shown in FIGURE 2 and bring the combination condensate gutter and support frame **18***b* into proper position at the opposite end of the skylight opening and position it on top of the curb **13** in the same manner as has been described for the previously secured end of the cover member **11**. This necessarily involves placing spacer **24***b* between channel member **19***b* and curb **13** and then securing these parts in fixed position by means of screws **26** driven into the curb. Such a procedure of flexing the sheet cover member **11** over the skylight opening produces a symmetrical curvature for the arched cover member and requires only that the spacers **24***a* and **24***b* be moved in such a manner that they substantially fill the wedge shaped cross sectional area between the channel members **19***a* and **19***b* and the adjacent curb **13** at which

time it is only necessary to tighten the screws **26** in order that the cover member **11** is secured to the curb **13**. At this time, only the open sides below the arched cover member are uncovered and, therefore, it is an easy matter to position the side closure halves **28, 29** in the proper manner to close the side openings to the weather.

Upon inserting the side closure halves, the cut-away portions **31** are positioned in conjunction with the gutters **21***a* and **21***b* and then each side closure is inserted within the cleat **33** which maintains the side closures in proper vertical position. If it is desired to weatherstrip the cover member **11**, a suitable gasket **35** may be placed between the side closures and the cover member to prevent the entry of moisture to the interior of the skylight. Once the side closure halves **28, 29** are in proper position, the screw fasteners **32'** are placed through apertures **32** and are driven into the curbing **13** to maintain the side closure halves in a permanent position. Each closure half **28, 29** has been elongated somewhat to provide a certain amount of overlap at the juncture of the side closure halves so as to compensate for any variation in the size of the skylight opening. While the side closure halves are said to be adjustable, it should be noted that in actuality the side closure halves are automatically adjusted to fit the arch of the cover member **11** when cut-away portions **31** are placed within the gutters **21***a*, **21***b*. This properly locates the side closure halves and it is then merely necessary to position them in a vertical plane to fit closely adjacent the cover member **11** wherein no further adjustment of the closure halves should be necessary.

It will be apparent that the condensation gutter and support frame portion of the assembly need not be constructed precisely in the manner hereinbefore described. One exemplary variation is illustrated in FIGURE 6, wherein the condensation gutter is formed as a separate extruded member indicated by the reference character **21'** adapted to be affixed to the curb **13** by suitable fasteners, and the support frames for the flexible cover member **11** are each formed of a pair of extruded strip members **36, 37**, secured to the flexible cover member **11**, for example, by pop rivets **38**. The outer strip member **36** may have an acute angle profile as shown while the inner member **37** may have a lower mounting flange portion **39** adapted to be affixed to the side of the curb **13** by screws, surmounted by an acute angle portion conforming substantially to the configuration of strip member **36** providing an outwardly projecting horizontal web **40** which is perforated to provide drip openings and an inclined portion **41** adapted to parallel the corresponding portion of strip member **36** and abut the under surface of the flexible cover member **11**.

The foregoing description has shown a new and novel skylight construction in which a roofing contractor may compensate for any relatively small differences in the size of the finished skylight opening and curb and the sizes called for in the construction specifications. Such a novel construction as is embodied in the present skylight obviously has advantages over the previously known rigid dome skylights.

While I have particulary shown and described one particular embodiment of the invention, it is distinctly understood that the invention is not limited thereto but that modifications may be made within the scope of the invention, and such variations as are covered by the scope of the appended claims.

What is claimed is:

1. In a skylight for covering a building opening surrounded by a curb, a skylight covering comprising a flexible sheet formed over the building opening in an upwardly arched convex configuration providing open segment side areas, means for adjustably fastening the sheet along two opposite marginal edges thereof to the skylight curb to conform to variations in the dimensions of the skylight curb, and variable length adjustable side

closure means positioned between the arched sheet and the curb wherein a unitary weatherproof structure is maintained.

2. In a skylight for covering a building opening surrounded by a curb, a skylight covering comprising a flexible plastic sheet formed over the building opening in an upwardly arched convex configuration providing open segment shaped side areas, securing means for adjustably fastening the sheet along two opposite marginal edges thereof to the skylight curb to conform to variations in the dimensions of the skylight curb, said securing means including a substantially U shaped channel attached to to each of said marginal edges of said sheet with a flanged condensate gutter extending inwardly from each channel, and variable length adjustable side closure means positioned between the arched sheet and the curb wherein a unitary weatherproof structure is maintained.

3. In a skylight for covering a building opening surrounded by a curb, a skylight covering comprising a flexible plastic sheet formed over the building opening in an upwardly arched convex configuration providing open segment shaped side areas, securing means for adjustably fastening the sheet along two opposite marginal edges thereof to the skylight curb to conform to variations in the dimensions of the skylight curb, said securing means including a U shaped channel member having parallel legs flanking both surfaces of the flexible sheet along said marginal edges to encompass each marginal edge, the channel members each having a flanged condensate gutter extending inwardly to rest upon the curb to provide support to the flexible sheet, and variable length adjustable side closure means positioned between the arched sheet and the curb wherein a unitary weatherproof structure is maintained.

4. In a skylight for covering a building opening surrounded by a curb, a skylight covering comprising a flat flexible plastic sheet adapted to be formed over the building opening in an upwardly arched convex configuration providing open segment shaped side areas, means for adjustably fastening the sheet along two opposite marginal edges thereof to the skylight curb to conform to variations in the dimensions of the skylight curb, the two opposite marginal edges each having a substantially U shaped channel member having parallel legs flanking both surfaces of the flexible sheet and to encompass the adjacent edge thereof, the channel members each having a flanged condensate gutter extending therefrom, a spacer positioned between each channel member and the curb for movement adjacent the curb in a vertical plane to vary the effective spacing between the channel member and the curb, and variable length adjustable side closure means positioned between the arched sheet and the curb wherein a unitary weatherproof structure is maintained.

5. In a skylight for covering a building opening surrounded by a curb, a skylight covering comprising a flat flexible plastic sheet formed over the building opening into an upwardly arched convex configuration providing open segment shaped side areas, means on the flexible sheet adjustably securing the sheet along two opposite marginal edges thereof to the skylight curb to conform to variations in the dimensions of the skylight curb, the two opposite marginal edges each having a substantially U shaped channel member having parallel legs flanking both surfaces of the flexible sheet and encompassing the adjacent edge thereof, the channel members each having a flanged condensate gutter extending inwardly therefrom, the condensate gutters resting upon the curb to provide support to the flexible sheet, a spacer of truncated wedge shape configuration positioned between each channel member and the curb and adapted to be moved adjacent the curb in a vertical plane to vary the effective spacing between the channel member and the curb, and adjustable side closure means positioned between the arched sheet and the curb wherein a unitary weatherproof structure is maintained.

6. In a skylight for covering a building opening surrounded by a curb, a skylight covering comprising a flexible plastic sheet formed over the building opening in an upwardly arched convex configuration providing open segment shaped side areas, means for adjustably securing the sheet along two opposite marginal edges thereof to the skylight curb to conform to variations in the dimensions of the skylight curb, and adjustable side closure means positioned between the arched sheet and the curb, the side closure means being of generally circular segment configuration and comprising interfitting closure halves located at each open segment shaped side area, and being adjustable parallel to the top of the curb toward and away from said marginal edges so that a unitary weatherproof structure is maintained.

7. In a skylight for covering a building opening surrounded by a curb, a skylight covering comprising a flexible plastic sheet formed over the building opening in an upwardly arched convex configuration providing open segment shaped side areas, means for adjustably securing the sheet along two opposite marginal edges thereof to the skylight curb to conform to variations in the dimensions of the skylight curb, and adjustable side closure means positioned between the arched sheet and the curb, the side closure means being of generally circular configuration and comprising longitudinally relatively movable closure halves located at each open segment shaped side area to vary the overall length of said closure halves to effect closure of open side areas of variable lengths to provide a unitary weatherproof structure.

8. In a skylight for covering a building opening surrounded by a curb, a skylight covering comprising a flexible plastic sheet formed over the building opening in an upwardly arched convex configuration providing open segment shaped side areas, securing means for adjustably fastening the sheet along two opposite marginal edges thereof to the skylight curb to conform to variations in the dimensions of the skylight curb, said securing means including a substantially U shaped channel member having parallel legs flanking both surfaces of the flexible sheet and to encompass the adjacent edge thereof, the channel members each having a flanged condensate gutter extending inwardly therefrom, the condensate gutters resting upon the curb to provide support to the flexible sheet, a spacer of truncated wedge shape configuration positioned between each channel member and the curb for movement adjacent the curb in a vertical plane to vary the effective spacing between the channel member and the curb, and adjustable side closure means positioned between the arched sheet and the curb, the side closure means being of generally circular segment configuration and comprising interfitting closure halves located at each open segment shaped side area, the closure halves being adapted for selective longitudinal adjustment with respect to one another to effect closure of the open side areas wherein a unitary weatherproof structure is maintained.

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