

Aug. 26, 1941.

J. J. OHLIS

2,253,527

SKYLIGHT CONSTRUCTION

Filed Nov. 18, 1940

2 Sheets-Sheet 1

FIG. 1.

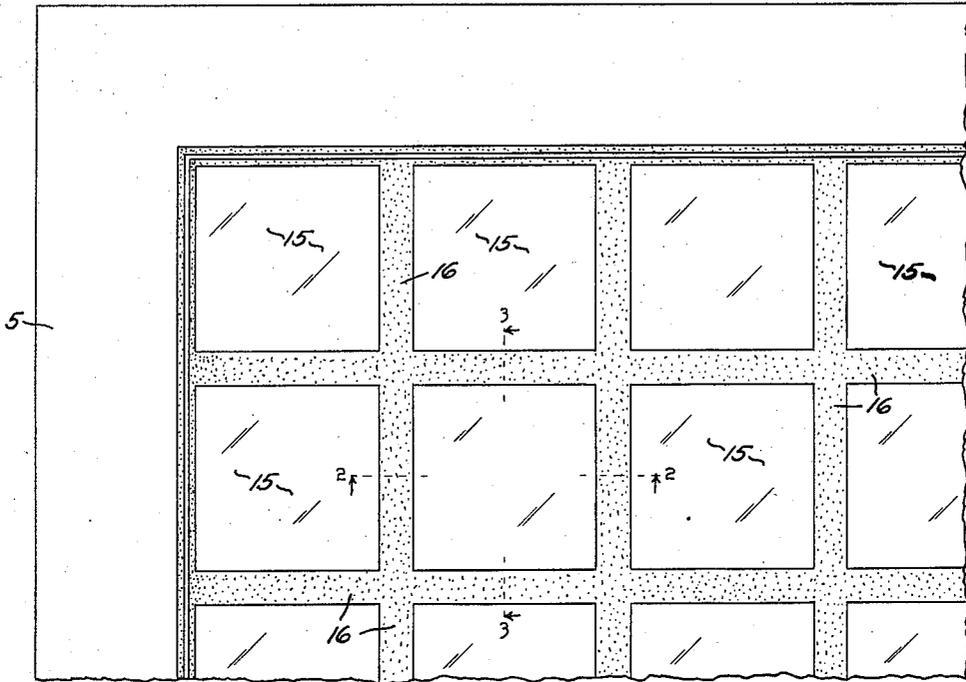
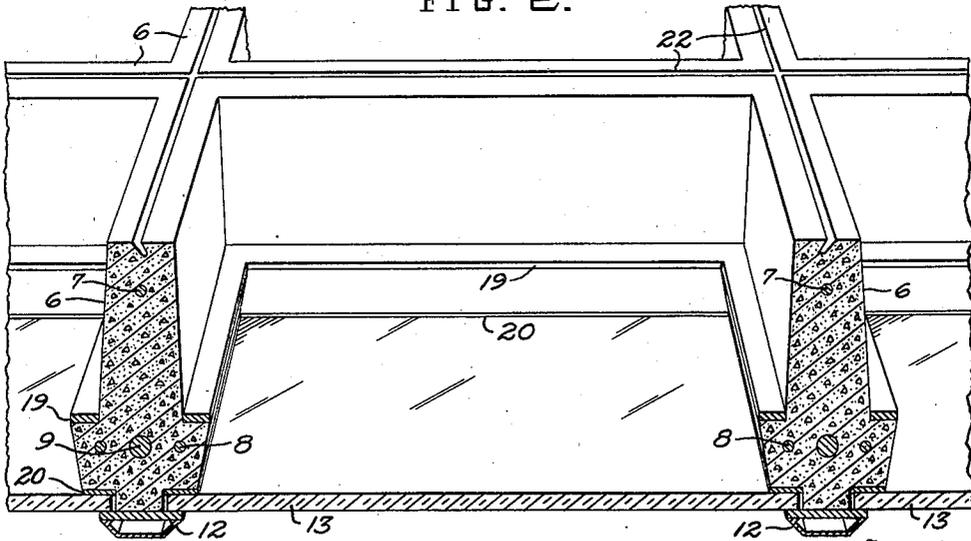


FIG. 2.



Inventor

J. J. OHLIS

By

Attorney

Aug. 26, 1941.

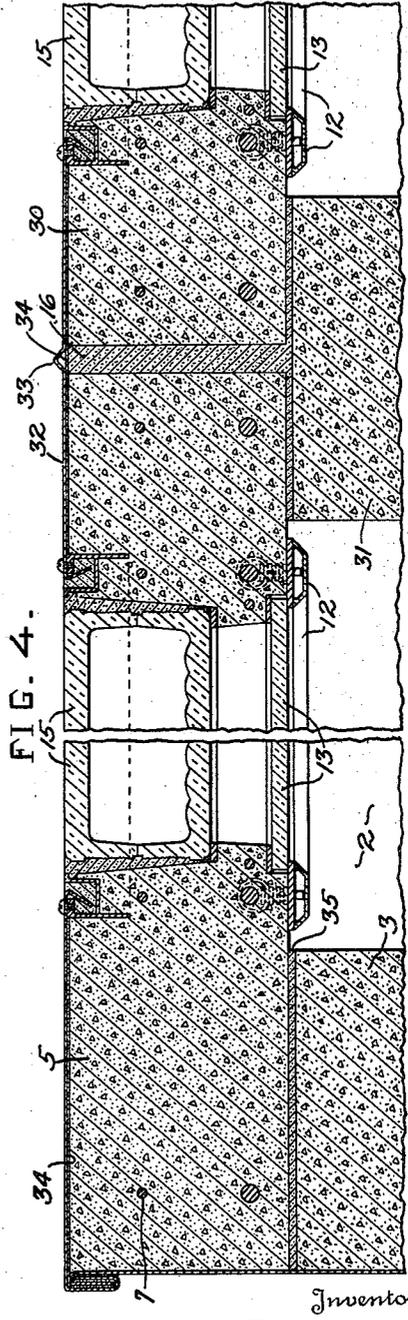
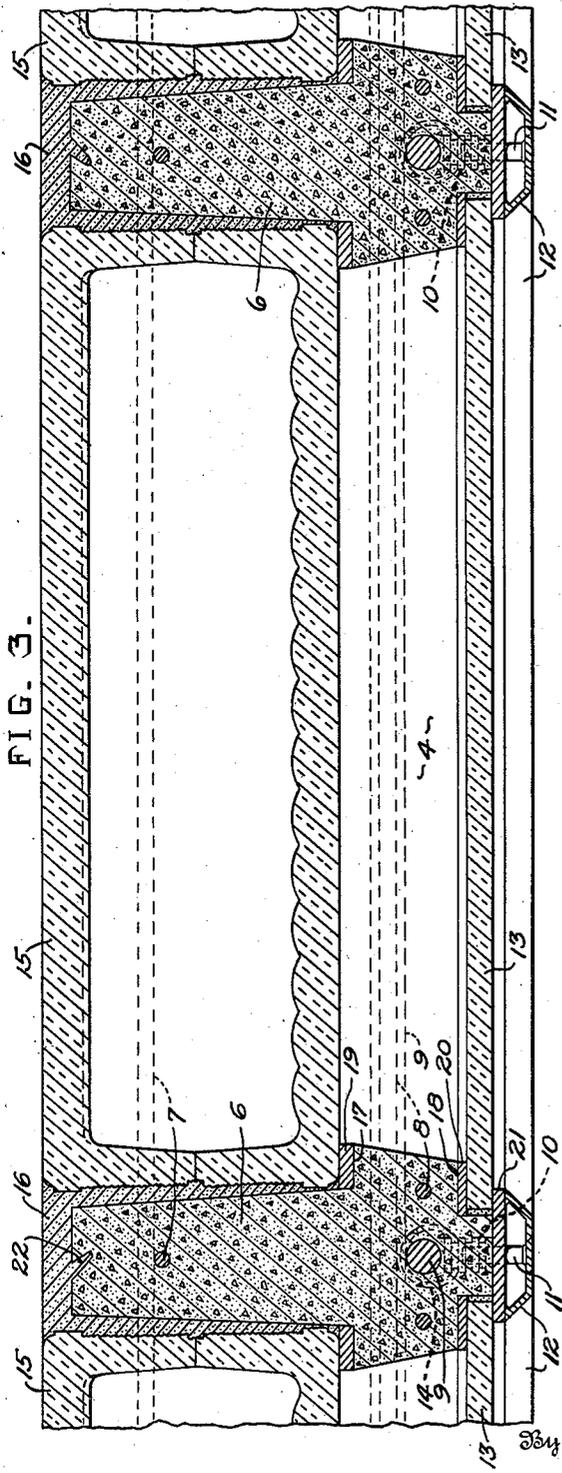
J. J. OHLIS

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Filed Nov. 18, 1940

2 Sheets-Sheet 2



Inventor
J. J. OHLIS

J. J. Ohlis
Attorney

UNITED STATES PATENT OFFICE

2,253,527

SKYLIGHT CONSTRUCTION

Julius J. Ohlis, Oak Park, Ill.

Application November 18, 1940, Serial No. 366,164

8 Claims. (Cl. 108—16)

This invention relates to skylights and similar devices having for its object to provide a construction which is simple in parts and more efficient in use than those heretofore proposed.

With these and other objects in view the invention resides in the novel details of construction and combinations of parts as will be disclosed more fully hereinafter and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification and in which like numerals designate like parts in all the views—

Fig. 1 is a partial plan view of a skylight made in accordance with this invention;

Fig. 2 is a partial perspective view of the cell construction created by the intersecting ribs extending across the skylight opening, said view taken as on the line 2—2 of Fig. 1 and looking in the direction of the arrows;

Fig. 3 is a vertical sectional view through the skylight taken as on the line 3—3 of Fig. 1 and looking in the direction of the arrows; and

Fig. 4 is a vertical sectional view somewhat similar to Fig. 3 but illustrating a modified form of the skylight construction.

This invention is particularly directed to skylights, vault lights and other similar structures wherein double glazing is employed, such glazing comprising a series of hollow glass blocks disposed in one plane, and a series of solid glass panes disposed in a plane spaced from and parallel to the plane of the hollow glass blocks, whereby there is provided an air space between the glazings for insulation and other purposes. This invention constitutes an improvement over that disclosed in U. S. Letters Patent No. 2,116,838 granted May 10, 1938, to George H. Lenke entitled Double glazed skylight, in that a more efficient construction is provided by this invention due to the employment of the hollow glass blocks comprising one of the glazings.

Referring to the drawings, a skylight opening is generally indicated by the numeral 2 in the roof of a building, which opening is defined by curbs 3 extending slightly upwardly with respect to the upper plane of the roof proper, and the skylight opening is covered by a fabricated skylight preferably of reinforced concrete resting upon said curbs and carrying the glazing, metallic flashing or sheathing being provided over the exposed portions of the concrete skylight structure and extending downwardly over the lateral edges thereof and covering the outer surfaces of the curbs and suitably joined in any convenient

manner to the metallic sheet roofing covering the roof proper, all as will be readily understood in this art.

More specifically the concrete skylight structure is provided with a plurality of light admitting openings or cells generally identified by the numeral 4 which are defined by the lateral portions such as 5 of the skylight structure as well as by the ribs such as 6 extending across the skylight opening. In other words, ribs extend in one direction across the skylight opening in parallel spaced relation to each other from one lateral portion 5 to the opposite lateral portion, and similar ribs extend across said skylight opening in spaced relation to each other but disposed angularly to the first mentioned ribs, intersecting the same and terminating in the other opposite side portions of the skylight structure. Reinforcing rods such as 7 are embedded in the upper extremities of the ribs and the lateral portions or frame of the skylight, and a plurality of similar reinforcing rods such as 8 are disposed in the lower extremities of the ribs and frame of the skylight.

In addition to the reinforcing rods 7 and 8, there is preferably provided in the central lower extremity of each rib a heavier rod or bar such as 9 which not only additionally reinforces the rib but provides a support for spaced sockets such as 10 terminating in the lower surface of the rib and adapted to threadingly receive a bolt such as 11 by which strips indicated at 12 may be secured in place for holding the lower glazing panes 13 in position. These sockets may conveniently be provided with a ring such as 14 encircling the bar 9 for positioning the socket at the time the concrete is poured to ultimately form the rib, but it will be understood that other means may be employed for positioning such sockets. The spacing of the sockets in the ribs may also be as desired though preferably there will be a socket at the intersection of the central vertical planes of two intersecting ribs, and one or more additional sockets may be provided if necessary between the rib intersections, according to the dimensions of the glasses comprising the glazing. The reinforcing rods such as 7 and 8 as well as the larger bars 9 will be continuous across the skylight with their ends terminating somewhere in the lateral portion or frame of the skylight and, as particularly shown in Fig. 3, these rods and bars will be positioned to avoid the similar rods and bars embedded in the intersecting ribs.

As hereinbefore stated the skylight comprises a reinforced concrete construction provided with

cells to receive the glazing, and therefore it may be fabricated on or away from the job, in the latter instance it being hoisted into position upon the curbs defining the skylight opening of the roof. It is to be understood that the skylight may be rectangular or of any other suitable perimetric shape, wherefore square, oblong, or other perimetrically formed glasses may constitute the glazing. In any instance, the lateral portions or frame and the ribs will be of a homogeneous and/or unitary concrete construction forming in effect a grid, with the light admitting openings or cells 4 bounded by the intersecting ribs, said cells of course of a shape corresponding to the perimetric shape of the glasses to be used. In the exemplification illustrated in the drawings, the cells have been indicated as substantially square for simplicity.

Each rib is substantially of the shape of a cross in vertical cross section, with the head of the cross at the lower portion of the rib. The leg or upper portion of the rib is of a vertical extent in accordance with the thickness (from top to bottom) of the hollow glass block such as 15 to be used, and the opposite vertical sides of this leg are inclined convergently or toward each other in the upward extent of the rib as clearly illustrated, the hollow glass block substantially snugly fitting such sides in the region of the bottom face of the block, thereby leaving a substantial space between the sides of the block and the upper extremity of the rib into which space a suitable cement indicated at 16 may readily be pressed to seal the block in its cell. By this construction it will be seen that the ribs provide a ready means for centering the glass block in its cell, wherefore no adjustment of the block is necessary in order to provide substantially equal spaces therearound for the cementitious sealing material.

The cross shape of each rib provides a head which defines the spacing between the upper and lower glazings, and also defines or provides the upper shoulder such as 17 and the lower shoulder such as 18, which shoulders constitute seats for the hollow glass blocks and the solid glass panes respectively, with gaskets such as 19 and 20 of cork or other suitable cushioning material interposed between said shoulders and the surfaces of said glasses. The opposite vertical sides of the head portion of this cross shaped rib are inclined convergently or toward each other in the downward extent of the rib as illustrated, so as to make possible the admission of the maximum quantity of light passing through the cell into the room beneath the skylight. The extreme bottommost portion of each rib has a downward extension disposed centrally of the rib and of an extent in accordance with the thickness (from top to bottom) of the solid glass pane such as 13 constituting the lower glazing so that, when the lower glazing is secured in place, the bottom surface of the solid glass pane will lie substantially in the plane of the bottom surface of the rib, a gasket such as 21 of cork or other suitable cushioning material being interposed between said surfaces and the securing strip 12, with suitable cement disposed around the lateral edges of the glass pane to provide a sealed joint as will be readily understood.

The extreme upper surface of each rib is provided substantially centrally thereof with a groove such as 22 of such shape as to keyingly receive and hold the cementitious material 16 provided to fill the space between the upper portions

of the hollow glass blocks, and in this connection it is an important feature of this invention that the top surface of each rib will lie in a plane disposed below the plane of the upper surfaces of the hollow glass blocks, so that there will be an appreciable amount of such cementitious material over the top of each rib connecting and uniting with the same material along the sides of the glass block, to establish a substantially permanent seal, not readily nor easily broken as by accident or cracking. The hollow glass blocks contemplated in this construction are well known in the market and form no specific part of this invention except in their relation to the ribs of the skylight and the solid glass panes constituting the lower glazing, such hollow glass blocks having a vacuum or semi-vacuum interior space which renders them admirable in installations wherein insulation against heat and cold is desired. The lateral side surfaces of such blocks are generally provided with irregularities comprising either grooves or ribs, or both grooves and ribs, for establishing a better bond between the surface of the block and the cementitious material used so that, once a block is cemented in place, it cannot be displaced accidentally but requires the removal of the cementitious material to loosen and remove the block.

In the modification shown in Fig. 4 the construction is generally the same as hereinbefore described except that in this figure of drawings two similar skylights 5 and 30 are illustrated disposed adjacent each other with their adjacent edges supported on a supporting concrete beam 31. This construction is provided where the skylight opening in the roof is too large for a single skylight structure, or, where the member 31 instead of a beam may be the upper extremity of a wall between two adjoining rooms. The space between the adjacent sides of the skylights 5 and 30 is filled with a suitable cementitious material such as 16 and the metallic flashing such as 32 extending across this joint is preferably formed with a ridge or upward bend 33 over said joint for expansion purposes and/or drainage.

In either construction, i. e. single or plural skylights, there is provided a suitable elastic membrane 34 between the metallic sheathing or flashing and the upper surface of the skylight construction, which may be the usual asphaltic roofing paper or other suitable medium and which may protect the under surface of such flashing from the relatively rough upper surface of the concrete skylight. In addition, felt, mastic or other suitable material may be interposed as at 35 between the bottom surface of the skylight structure and the upper surface of the curb 3 or beam 31 to provide a complete closure between such rough surfaces as well as to provide adhesion therebetween.

A distinct advantage resides in utilizing the hollow glass blocks for the upper glazing because the vacuum or semi-vacuum space therein provides insulating qualities against the transmission of heat and cold, and this insulation is augmented by the dead air space between the upper and lower glazing. In addition, the hollow glass blocks have greater individual strength than the solid glass panes and hence may support greater weights than said panes where this type of construction is particularly used in vault lights subjected to traffic. Also, if the solid panes were used for upper glazing, there would be a positive tendency for the formation and collection of condensation on the under surfaces thereof due

to the differential in the temperatures above and below the skylight, but when the hollow glass blocks are employed for the upper glazing, the vacuum or semi-vacuum space contained therein constitutes an insulation against the passage of heat and cold through the block and therefore there is a decided avoidance of such formation and collection of condensation either within the hollow block or on the under surface thereof.

Whereas, in the foregoing, it has been stated that the cell sides of each rib are converged toward each other in the upward extent of the rib so that the cell width in the region of the bottom portion of the glass block is substantially equal to the width of said block, and the width of the cell in the region of the upper portion of said block is materially greater than the width of said block, whereby this convergent construction causes the block to be centered in the cell, it is evident that the entire cell side of the rib need not have such convergency, but rather the rib could be formed with tapering beads at spaced intervals, with the remaining portions of the rib surface perpendicular, to accomplish the same result and to provide a greater area for receiving the cementitious material or sealing compound which secures the block in its cell. Therefore this invention contemplates any means associated with the rib for centering the block in its cell. The gasket 21 interposed between the locking strip and the under surfaces of the rib and the solid glass panes, provides the means for securing such locking strip under tension, since said gasket is of cork or other yieldable substance.

It is obvious that those skilled in the art may vary the details of construction and arrangements of parts without departing from the spirit of this invention wherefore it is desired not to be limited to the exact foregoing disclosure except as may be required by the claims.

What is claimed is:

1. A skylight structure comprising a grid and glazing, the grid consisting of intersecting ribs and a circumscribing frame, the ribs defining light admitting cells for the glazing, the glazing comprising a plurality of glasses, a glass in each cell, the cell sides of each rib converging in the upward extent of the rib and terminating at their lower extremities in a shoulder extending into a cell and supporting the lower edge portion of a glass, the upper surface of each rib disposed in a plane disposed below the plane of the top surfaces of the adjacent glasses, the upper portion of each rib having a groove formed inwardly thereof for keyingly receiving a cementitious material, and cementitious material covering the upper portions of said ribs and extending into said grooves and into the spaces between the ribs and glasses to seal each glass in its cell.

2. A skylight structure comprising a grid and glazing, the grid consisting of intersecting ribs and a circumscribing frame, the ribs defining light admitting cells for the glazing, the glazing comprising a plurality of glasses, a glass in each cell, each rib having a shoulder extending into a cell and supporting the lower edge portion of a glass, each rib having means for centering a glass in its cell, the upper surface of each rib disposed in a plane disposed below the plane of the top surfaces of the adjacent glasses, the upper portion of each rib having an indentation formed inwardly thereof for keyingly receiving a cementitious material, and cementitious material covering the upper portions of said ribs and extending into said indentations and into the spaces be-

tween the ribs and glasses to seal each glass in its cell.

3. A skylight structure comprising a grid and glazing, the grid consisting of intersecting ribs and a circumscribing frame, the ribs defining light admitting cells for the glazing, the glazing comprising a hollow glass block in the upper portion of each cell and a solid glass pane in the lower portion of each cell, each rib having a shoulder supporting the lower edge portion of a block and another shoulder against which is fitted the upper edge portion of a pane, said shoulders spaced vertically from each other and connected by a side portion of the rib the surface of which is inclined in its downward extent toward the central vertical plane of the rib, the upper and lower glazing thereby providing an air space therebetween in each cell, cementitious material covering the top surface of each rib and extending downwardly into the spaces between the ribs and blocks to seal each block in its cell, and a locking strip secured under tension to the bottom of each rib and underlying the lower edge portions of the adjacent panes.

4. A skylight structure comprising a grid and glazing, the grid consisting of intersecting ribs and a circumscribing frame, the ribs defining light admitting cells for the glazing, the glazing comprising a hollow glass block in the upper portion of each cell and a solid glass pane in the lower portion of each cell, each rib having a shoulder supporting the lower edge portion of a block and another shoulder against which is fitted the upper edge portion of a pane, said shoulders spaced vertically from each other and connected by a side portion of the rib the surface of which is inclined in its downward extent toward the central vertical plane of the rib, the upper and lower glazing thereby providing an air space therebetween in each cell, each rib having means for centering a block in its cell and comprising a side portion the surface of which is inclined in its upward extent toward the central vertical plane of the rib, cementitious material covering the top surface of each rib and extending downwardly into the spaces between the ribs and blocks to seal each block in its cell, and a locking strip secured under tension to the bottom of each rib and underlying the lower edge portions of adjacent panes.

5. A skylight structure comprising a grid and glazing, the grid consisting of intersecting ribs and a circumscribing frame, the ribs defining light admitting cells for the glazing, the glazing comprising a hollow glass block in the upper portion of each cell and a solid glass pane in the lower portion of each cell, each rib having a shoulder supporting the lower edge portion of a block and another shoulder against which is fitted the upper edge portion of a pane, said shoulders spaced vertically from each other and connected by a side portion of the rib the surface of which is inclined in its downward extent toward the central vertical plane of the rib, the upper and lower glazing thereby providing an air space therebetween in each cell, each rib having means for centering a block in its cell and comprising a side portion the surface of which is inclined in its upward extent toward the central vertical plane of the rib, the upper surface of each rib provided with an indentation for keyingly receiving a cementitious material, cementitious material covering the top surface of each rib and extending downwardly into such indentation as well as into the spaces between the ribs and blocks to seal

each block in its cell, and a locking strip secured under tension to the bottom of each rib and underlying the lower edge portions of adjacent panes.

6. A skylight structure comprising a grid and glazing, the grid consisting of intersecting ribs and a circumscribing frame, the ribs defining light admitting cells for the glazing, the glazing comprising a hollow glass block in the upper portion of each cell and a solid glass pane in the lower portion of each cell, each rib having a shoulder supporting the lower edge portion of a block and another shoulder against which is fitted the upper edge portion of a pane, said shoulders spaced vertically from each other and connected by a side portion of the rib the surface of which is inclined in its downward extent toward the central vertical plane of the rib, the upper and lower glazing thereby providing an air space therebetween in each cell, each rib having means for centering a block in its cell and comprising a side portion the surface of which is inclined in its upward extent toward the central vertical plane of the rib, the upper surface of each rib disposed in a plane appreciably below the plane of the top surfaces of the adjacent blocks, such upper surface of each rib provided with an indentation for keyingly receiving a cementitious material, cementitious material covering the top surface of each rib and extending downwardly into such indentation as well as into the spaces between the ribs and blocks to seal each block in its cell, and a locking strip secured under tension to the bottom of each rib and underlying the lower edge portions of adjacent panes.

7. A skylight structure comprising a grid and glazing, the grid consisting of intersecting ribs and a circumscribing frame, the ribs defining light admitting cells for the glazing, the glazing comprising a hollow glass block in the upper portion of each cell and a solid glass pane in the lower portion of each cell, each rib having a shoulder supporting the lower edge portion of a block and another shoulder against which is fitted the upper edge portion of a pane, said shoulders spaced vertically from each other and connected by a side portion of the rib the surface of

which is inclined in its downward extent toward the central vertical plane of the rib, the upper and lower glazing thereby providing an air space therebetween in each cell, each rib having means for centering a pane in its cell and comprising a central downward extension of the rib, cementitious material covering the top surface of each rib and extending downwardly into the spaces between the ribs and blocks to seal each block in its cell, and a locking strip secured under tension to the downward extension of each rib and underlying the lower edge portions of adjacent panes.

8. A skylight structure comprising a grid and glazing, the grid consisting of intersecting ribs and a circumscribing frame, the ribs defining light admitting cells for the glazing, the glazing comprising a hollow glass block in the upper portion of each cell and a solid glass pane in the lower portion of each cell, each rib having a shoulder supporting the lower edge portion of a block and another shoulder against which is fitted the upper edge portion of a pane, said shoulders spaced vertically from each other and connected by a side portion of the rib the surface of which is inclined in its downward extent toward the central vertical plane of the rib, the upper and lower glazing thereby providing an air space therebetween in each cell, each rib having means for centering a block in its cell and comprising a side portion the surface of which is inclined in its upward extent toward the central vertical plane of the rib, the upper surface of each rib disposed in a plane appreciably below the plane of the top surfaces of the adjacent blocks, such upper surface of each rib provided with an indentation for keyingly receiving a cementitious material, each rib having means for centering a pane in its cell and comprising a central downward extension of the rib, cementitious material covering the top surface of each rib and extending downwardly into such indentation as well as into the spaces between the ribs and blocks to seal each block in its cell, and a locking strip secured under tension to the downward extension of each rib and underlying the lower edge portions of adjacent panes.

JULIUS J. OHLIS.