

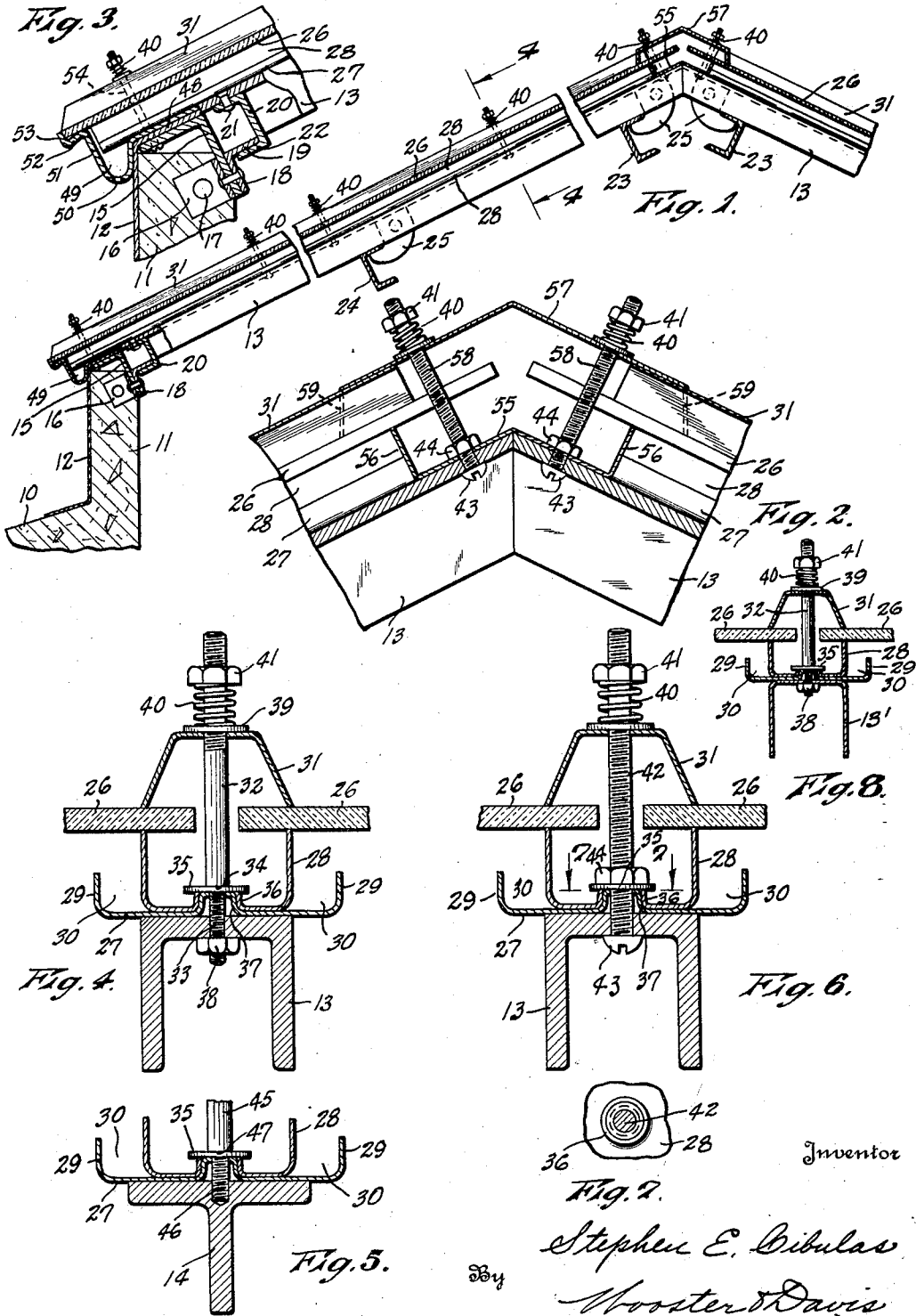
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SKYLIGHT CONSTRUCTION

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# UNITED STATES PATENT OFFICE

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## SKYLIGHT CONSTRUCTION

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This invention relates to a skylight construction, particularly to the construction of the means for supporting the glass of the skylight, and has for an object to provide a construction in which the amount of copper or similar high priced metal required may be reduced over the ordinary constructions.

It is also an object of the invention to provide a construction of skylight in which there is nothing to retain water to freeze and break the glass or supporting structure therefor.

Another object of the invention is to provide a construction of this type which will so support the glass that there is no lateral or bending strains which would be liable to break the glass.

With the foregoing and other objects in view, the invention consists in certain novel features of construction, combinations and arrangements of parts as will be more fully disclosed in connection with the accompanying drawing. In this drawing,

Fig. 1 is a vertical section through a skylight showing my improved construction.

Fig. 2 is a vertical section on an enlarged scale of the raised portion of the skylight construction.

Fig. 3 is a detail section through the means for supporting the structure on the top of the curb.

Fig. 4 is a transverse section substantially on line 4—4 of Fig. 1.

Fig. 5 is a detail section showing a different type of supporting beam.

Fig. 6 is a section similar to Fig. 4 showing a different means for securing the glass holding elements to the supporting beam.

Fig. 7 is a detail section substantially on line 7—7 of Fig. 6, and

Fig. 8 is a detail section similar to Fig. 4 showing a slightly different supporting beam.

Referring to Fig. 1 the roof is indicated at 10 with an upright curb 11 surrounding the skylight opening in this roof, the front wall of which is protected by a sheet metal flashing 12 usually of copper. The improved skylight construction comprises longitudinally spaced inclined supporting beams 13 of structural members which may be either steel or

other metal such, for example, as copper or galvanized iron. That shown in Figs. 1, 4 and 6 is of inverted U-shape or channel bar although it may be of any of numerous other structural members such as angle bars, I-beams or T-bars, as shown at 14, in Fig. 5. This structural member or beam 13 is supported at its lower end on the curb 11. It is secured thereto by an inverted angle bar 15 resting on the top of the curb and anchored thereto by angle plates 16 which may have transverse rods 17 molded or build into the wall of the curbing. To the front of this angle bar 15 is secured another angle bar 18 on the upper flange 19 of which the beam 13 may rest, the lower end of the beam abutting against the inner wall of the angle bar 15. The beam 13 may be secured in position by means of a channel member or bracket 20 riveted to the top of the beam 13, as shown at 21, and having its lower flange 22 extending under the upper flange 19, as shown in Figs. 1 and 3. This construction securely mounts the beam 13 on the curbing, and the upper portion of the flashing 12 may be extended up over the angle bar 15, as shown in Fig. 3, to protect it from moisture. The upper end of the beam 13 may engage a similar beam on the under side of the skylight and be supported by a longitudinally extending beam 23 of a channel bar or other suitable shape. If it is a wide skylight there may also be one or more other beams 24 extending longitudinally of the skylight intermediate the ends of the supporting beams 13. The beam 13 may be anchored to the beam 24 by means of a flat plate 25 riveted or bolted to the beam 13 and engaging under the top flange of the beam 24.

The supporting means for the glass 26 is mounted on the top of the supporting structural beams 13 and extend longitudinally thereof. Immediately to the top of the beam 13 is a sheet metal trough shaped member 27 which is ordinarily formed of sheet copper although it may, of course, be of galvanized iron or other suitable metal, and within this trough is mounted a U-shaped member 28 of sheet metal also preferably copper and its side walls are higher than the side walls 29

of the trough 27, while this member is of less width than the trough 27 so that the side walls 29 of the trough 27 are spaced outwardly from the side walls of the member 28. The upper edges of the side portions of the member 28 form rests on which the glass 26 is supported, and as these side walls are higher than the side walls 29 the glass is supported above the trough 27 so that condensation on the lower or inner surface of the glass may run down into the gutters 30 formed by the trough 27 on opposite sides of the member 28. Above the glass is a clamping member 31 of substantially inverted U or V-shape with its free edges resting on the top surface of the glass. This member is also of sheet metal preferably copper, and all three of the members 27, 28 and 31 are secured to the supporting beam 13 by means of any suitable number of upright bolts 32. In the form shown in Fig. 4 this bolt has a reduced threaded portion 33 at its lower end passing through the member 13 and provided with a shoulder 34 resting against the lead washer 35 on top of the upwardly extending bosses 36 and 37 on the members 28 and 27 respectively. These upwardly extending bosses prevent moisture which may get into the trough 27 of the member 28 from leaking through the opening surrounding the bolt 32. A nut 38 clamps the members 28 and 27 as well as the washer 35 between the shoulder 34 and the member 13 and securely fastens the members 13, 27 and 28 together. At its upper end the bolt 32 passes through a suitable opening in the clamping bar 31 which is closed by a lead washer 39, and a spring 40 embraces the bolt above this washer and between it and the nut 31 threaded on the bolt. The member 31 is more or less resilient, and therefore, yielding and the spring 40 also yields to allow for expansion and contraction of the glass as well as the other elements of the construction, and therefore, prevent undue strains on the glass which might break it. This construction, however, tightly clamps the glass 26 between the upper edges of the side portions of the member 28 and the lower edges of the clamping bar 31.

In the arrangement shown in Fig. 6 the sheet metal members are the same, as shown in Fig. 4, but the securing bolt 42 instead of being reduced at its lower end to form the shoulder 34 is threaded for its entire length and is provided with a lower head 43. The elements 27 and 28 are clamped to the member 13 by a nut 44 threaded onto this bolt.

In case the supporting beam 13 is an I-beam or T-bar, as shown in Fig. 5, the lower end of the bolt 45 corresponding to the bolts 32 and 42 is tapped into the top of the beam, as shown at 46, Fig. 5, the threaded portion being reduced in diameter to provide a shoulder 47 corresponding to the shoulder 44 so that the members 27 and 28 are clamped to

this beam between this shoulder and the top wall of the beam.

Referring to Fig. 3, it will be seen that there is a sheet metal trough member 48, ordinarily made of copper, secured on the top of the curbing over the upper part of the flashing 12. It extends downwardly on the outer surface thereof and then upwardly to form a trough 49 from which there may be discharge openings 50. The upwardly and outwardly extending portion 51 is outside the end of the members 27 and 28, and therefore, moisture from the gutters 30 goes into the trough 49. The upper end of the wall 51 is bent laterally outwardly at 52 and then upwardly, as shown at 53, to provide a stop wall for the lower edge of the glass 26, and these elements, including the elements 27, 28 and 31, are all secured to the angle bar 15 by a bolt 54, as shown in Fig. 3.

At the ridge of the skylight construction there is provided a sheet metal substantially double angular shaped member 55 resting on the upper ends of the beams 13. This member is usually constructed of sheet copper and has upwardly extending side walls 56 extending to the under side of the glass and against which the upper ends of the members 27 and 28 abut. A sheet metal ridge cover 57, also preferably of copper, is clamped to the top side of the glass over the member 55 by means of the bolts 58, which also serve to clamp the member 55 to the top of the supporting beams 13. The springs 40 are provided on these bolts the same as the other bolts 32, 42, and 45 just described. The upright side walls 59 of the member 57 have openings corresponding in shape to the members 31 so that the upper ends of these members 31 pass through these walls, as shown in Fig. 2, to prevent entrance of moisture.

The supporting beams 13 and 14 of Figs. 4, 5, 6 are shown as of structural steel shapes and they may be of any of the special or standard shapes and, of course, may be made of different metals. When structural steel shapes are used for these beams the amount of copper required is greatly reduced, and therefore, the cost of the skylight construction is greatly reduced. Some architects and builders, however, require a skylight construction of all copper. Under these circumstances in order to reduce the amount of metal the supporting beam or structural member may be made of sheet metal, as shown at 13', in Fig. 8. This also gives a somewhat lighter construction.

It will be seen from the above described constructions that the weight of the glass is supported by the structural beams (13, 13' and 14) and that the members 27 and 28 as well as adding strength to the construction form gutters under the glass to carry off moisture and support the glass above the beams 13 in such a manner that strains in-

cident to expansion and contraction do not break the glass as the members 28, 31 and 40 are yieldable. Therefore, as a large part of the weight of the structure may be carried by the steel beams 13 and their supporting beams 18, 24, and 23 it is not required to make the members 27 and 28 of sufficient size or shape to carry this weight by themselves. Therefore, these members 27 and 28 which are ordinarily made of sheet copper and are, therefore, expensive require much less metal, and therefore, the amount of the expensive metals, such as copper, required in this construction of skylight may be greatly reduced over the old structures where the glass was carried wholly by the sheet metal copper supports. It is also apparent that there are no crevices or other structures which will retain moisture and might, therefore, later freeze to break the glass or spring the metallic structure to cause leakage.

Having thus set forth the nature of my invention, what I claim is:

1. A skylight construction comprising a structural supporting member extending upwardly from the curb, a substantially U-shaped sheet metal member mounted upon and extending longitudinally of the supporting member with its longitudinal side edges forming seats for glass, an inverted trough shaped sheet metal member above the glass and resting at its lower edges on the top surface thereof, and a securing bolt passing through the sheet metal members and secured to the supporting member.

2. A skylight construction comprising a structural member forming a supporting beam extending upwardly from the curb, a sheet metal substantially trough shaped member mounted on the beam and extending longitudinally thereof, a substantially U-shaped sheet metal member mounted in the trough shaped member and extending longitudinally thereof, said U-shaped member being of less width than the trough shaped member and having higher side walls than those of the trough shaped member to form seats at their upper edges for glass and support it above the trough shaped member, an inverted substantially trough shaped sheet metal member mounted with its lower edges resting on the top surface of the glass, and a connecting bolt extending between the beam and the inverted member to clamp the members together.

3. In a skylight construction, a structural member forming a supporting bar, a sheet metal trough shaped member mounted on the bar, a glass support comprising a substantially U-shaped sheet metal member mounted in the trough shaped member, the U-shaped member being of less width than the trough shaped member to provide condensation gutters on the opposite sides thereof, the side walls of the U-shaped member being higher

than those of the trough shaped member so that their edges provide rests for the glass above the gutters, an inverted substantially trough shaped sheet metal clamping member resting at its edges on the top side of the glass, and means for clamping the sheet metal members to the supporting bar.

4. In a skylight construction, a structural member forming a supporting bar, a substantially U-shaped sheet metal member mounted upon said bar with the top edges of its side walls forming seats for the glass, an inverted sheet metal clamping bar resting at its free edges on the top of the glass, and means for clamping the clamping bar to the supporting bar to secure the members together and clamp the glass between the edges of the clamping bar and the U-shaped member.

5. In a skylight construction, a structural member forming a supporting bar, a substantially U-shaped sheet metal member mounted upon said bar with the top edges of its side walls forming seats for the glass, an inverted sheet metal clamping bar resting at its free edges on the top of the glass, and a clamping bolt secured to the supporting bar and including means for clamping the U-shaped member to the bar and the glass between the free edges of this member and the clamping bar.

6. In a skylight construction, a curb, one or more longitudinal supporting members mounted above the curb, structural members forming supporting bars extending upwardly from the curb, means for securing said supporting bars to the curb and the supporting members, a sheet metal trough shaped member mounted on each supporting bar and extending longitudinally thereof, a substantially U-shaped sheet metal member mounted in each trough shaped member with its upright free edges extending above the sides of the trough shaped members to provide seats for glass, an inverted substantially trough shaped sheet metal clamping member above each U-shaped member arranged with its free edges resting on the top of the glass, bolts secured to the supporting bar and passing through the sheet metal members, and means on the bolt for clamping the sheet metal members in position.

In testimony whereof I affix my signature.  
STEPHEN E. CIBULAS.

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