B. STORCH.

SKYLIGHT.

APPLICATION FILED MAR. 17, 1910.

981,813.

Patented Jan. 17, 1911.

2 SHEETS—SHEET 1.

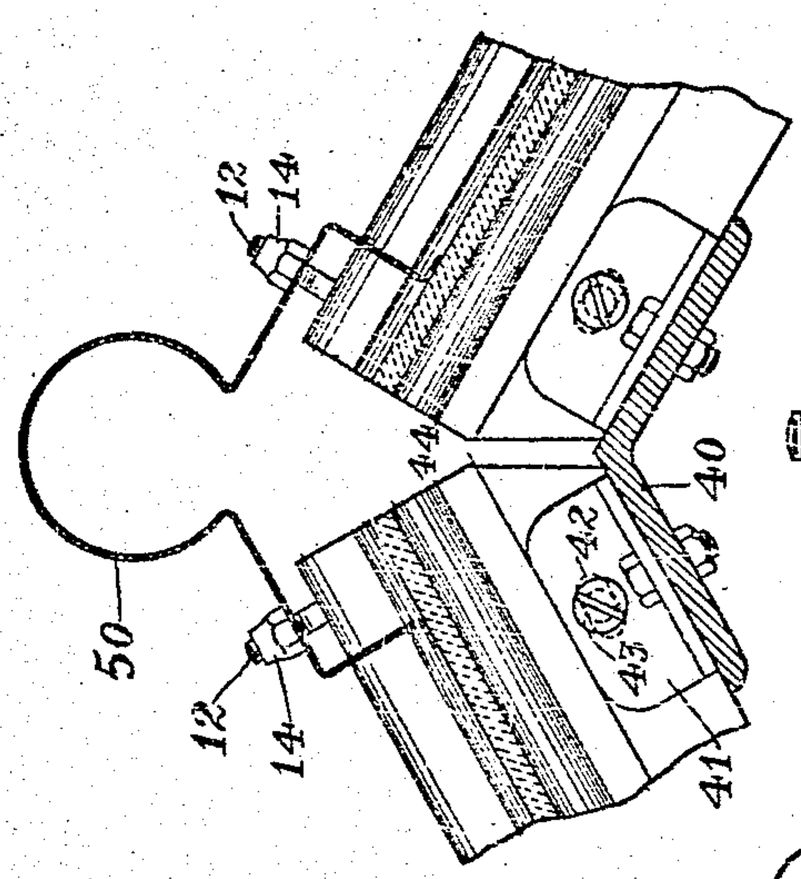


Fig. 1

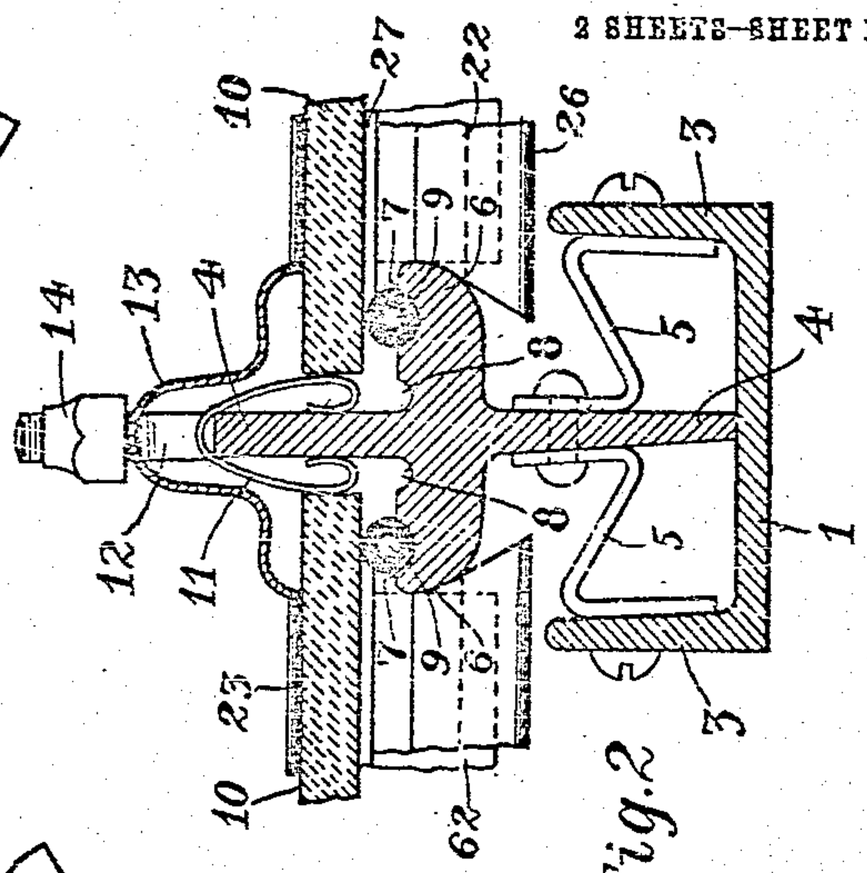
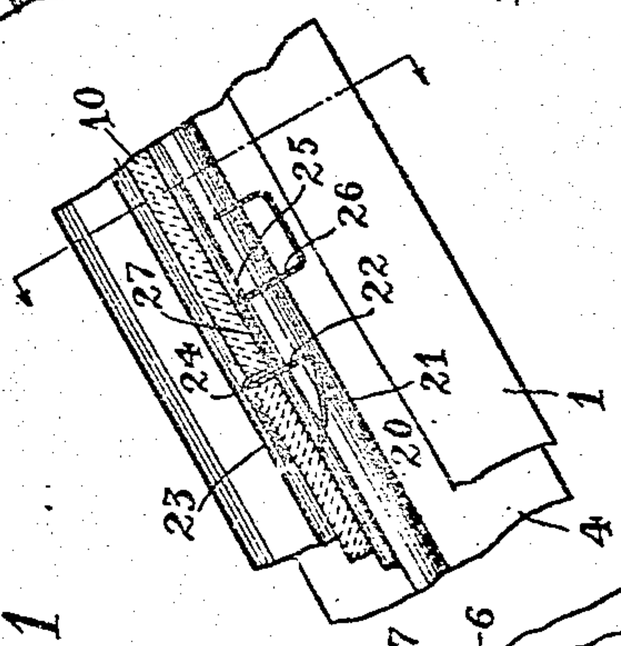
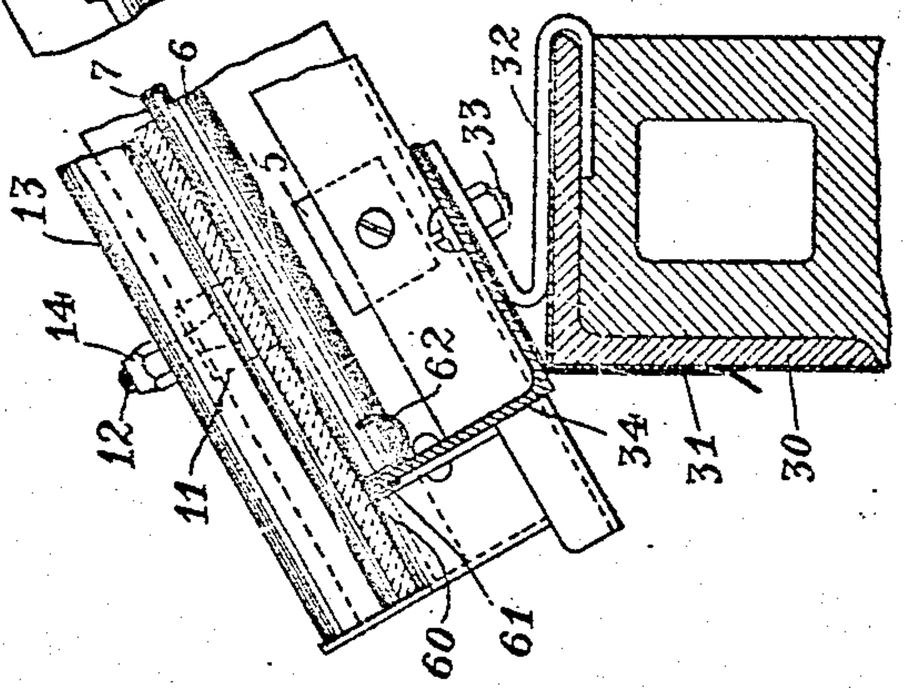


Fig. 2





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2 SHEETS—SHEET 2.

Fig. 3

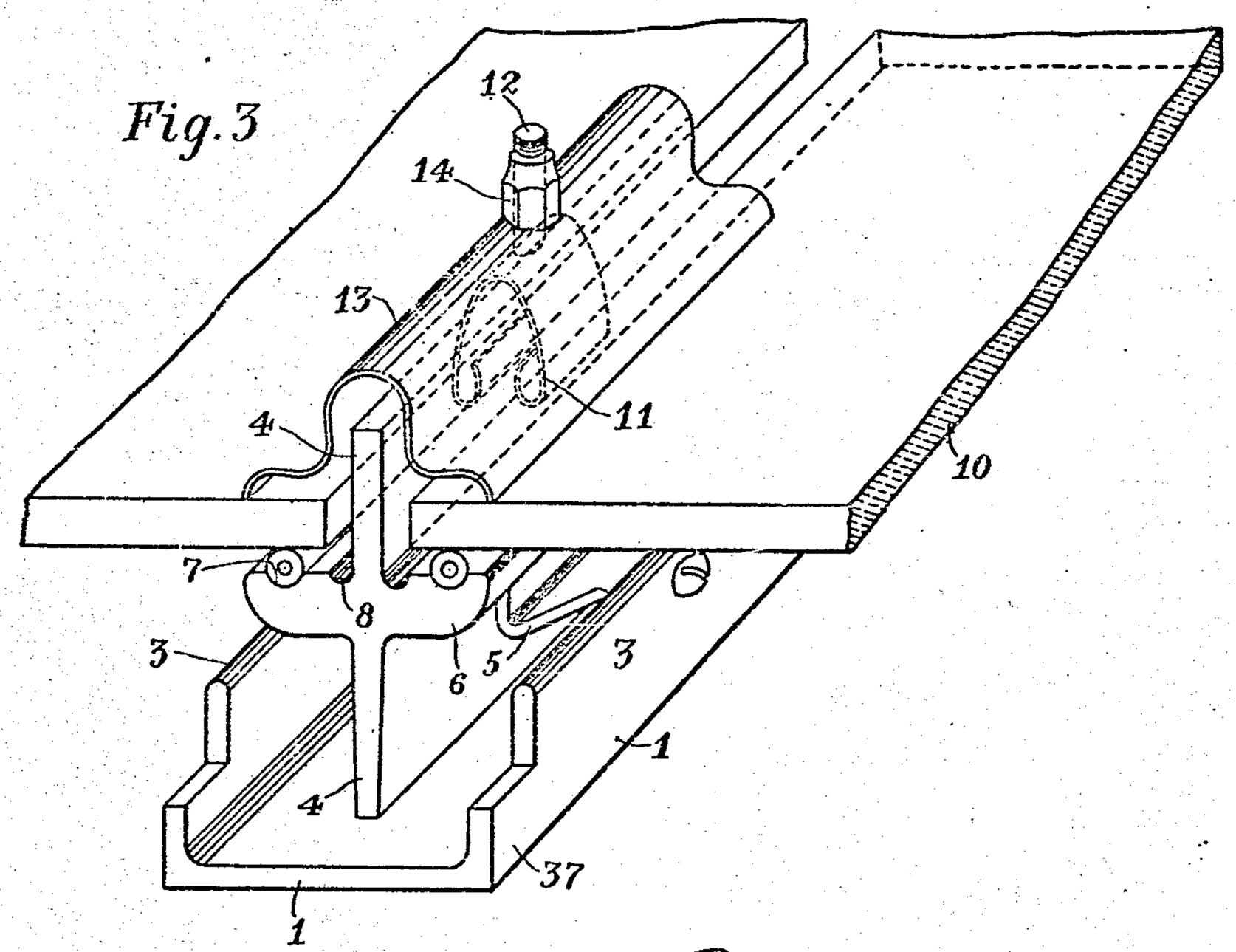
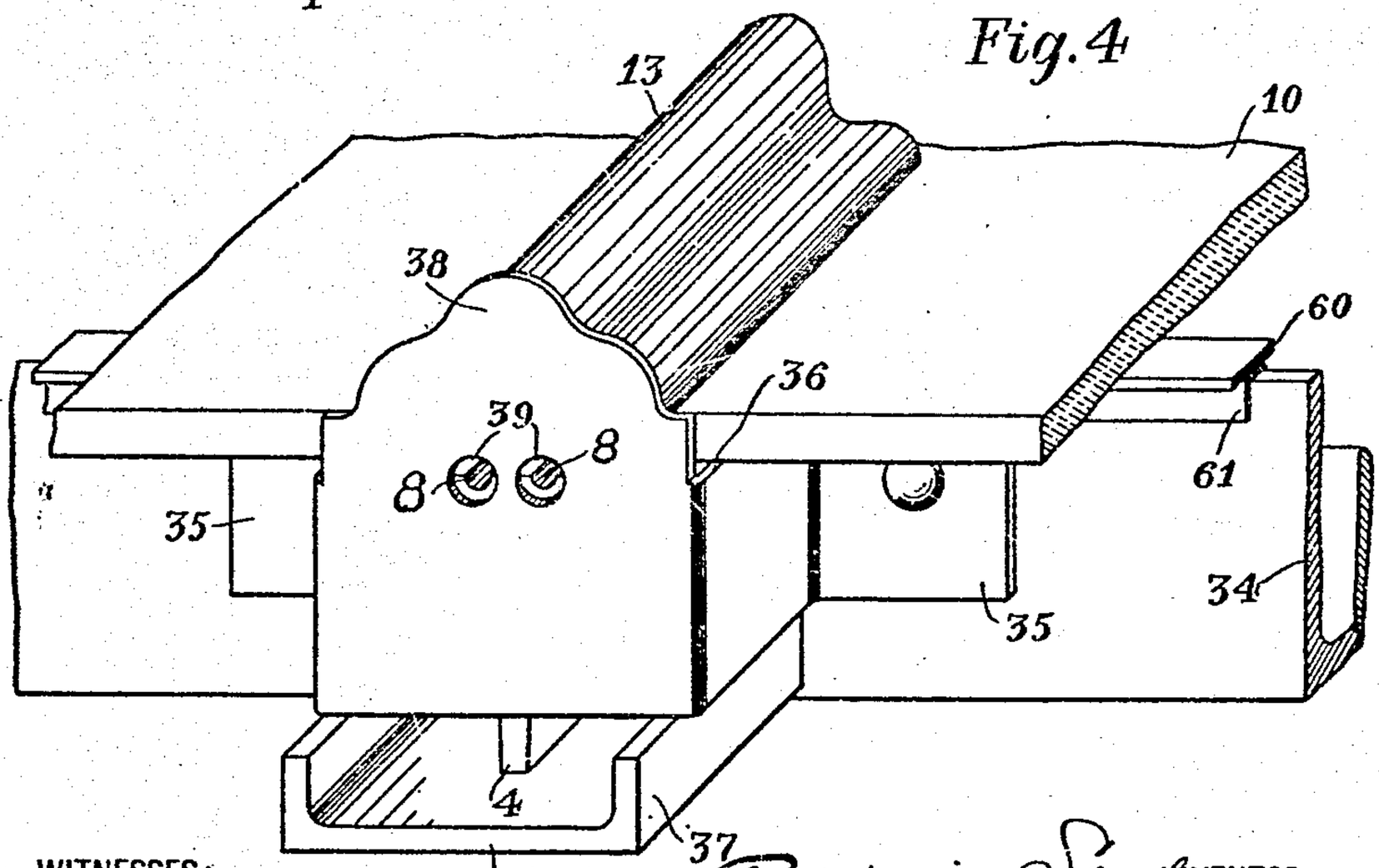


Fig. 4



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SKYLIGHT.

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Application filed March 17, 1910. Serial No. 550,055.

To all whom it may concern:

Be it known that I, BENJAMIN STORCH, a citizen of the United States, and whose residence is borough of Bronx, city and State of New York, have invented certain new and useful Improvements in Skylights, of which the following is a specification.

My invention relates to sky-lights and it has for its object to produce a sky-light which will not leak, will not permit the moisture of condensation to drip and one that will protect and prevent the plates from breaking.

It is especially adaptable to buildings in which vibrations occur.

The particular form of the invention shown and described herein has metal supports and means is provided for their expansion and contraction due to changes of temperature.

Means is also provided for draining the condensed moisture that collects on the sky-light and between its parts.

The underlying principles constituting my invention may be embodied in many forms of devices and constructions.

To show that the invention may be generally applied and is operative, I have described a construction involving its use.

The advantages of the invention contained in the construction described and illustrated is hereinafter mentioned, reference to the disadvantages of the sky-lights now known in the art being omitted.

In my invention I use a supporting beam. The beam is also provided with a cross web rolled from iron or steel into a single piece and having a cross-section of a cross. One web is of sufficient width to stand the vertical strain which is brought to bear upon the beam and is the main supporting part of the beam while the other web, namely, the cross web, prevents buckling of the first named web, namely, the main web. The upper portion of the cross web extends up between the plates of the sky-light and underneath a cap which is located over the edges of the plates. The beam is thus strengthened and the plates are supported and drained without raising the plates too high above the main trough, which would occur in the case of a T-beam. A channel or trough having a flat bottom which enables the beam to be placed upon any other beam or part of the building structure in which the sky-light is used, is attached to the main supporting web and the center of the bottom of the trough comes in contact with the lower edge of the main web. The web is provided with lead cushioning devices for supporting the plates and troughs, or channels are located in the cross web and conduct the water condensed in the space formed between the edges of the plates. Troughs extend across the ends of the plates and feed into the channel of the beam. The web is provided with channels which collect the moisture that may be found or occur in between the lead cushioning devices and the edges of the plates. The channels deliver the moisture at the end of the beam and on the outside of the building. The plates rest upon soft metal of either lead or copper, in each case on all four edges. The plates if resting against iron will be fractured if there is any jar. The same is true if one plate rests against another plate. A means is provided for permitting the expansion and contraction of the supporting beam without in any way affecting the tightness or the relation of the parts which coöperate together. The lower end of the beam is supported in the housing. The beam and the housing are movable with respect to each other. The beam may be lifted by expansion of other beams which may be longer which are used in the support of the roof or the housing which is supported on the curb or wall may be moved outward when vibrated. The upper end of the beam is provided with slotted connections which permit movement of the beam with respect to the supporting ridge. The sky-light is especially applicable to buildings where the vibration is more or less violent, such as in engine houses and in factories and the like.

The invention consists in features that are illustrated or may be suggested in the drawings or in the following description and that are covered by the claims.

Referring to the drawings, Figure 1 illustrates a side view of the invention. Fig. 2 illustrates a section of the beam shown in Fig. 1. Fig. 3 is a perspective view of the beam and the plates. Fig. 4 is a perspective view of the housing in which the beam is supported.

1 in Fig. 1 and Fig. 2 is a channel iron having flanges 3. A web 4 is secured to the channel iron by means of the arms 5. The

web 4 is provided with flanges 6 which extend outward on either side. The flanges 6 are provided with two channels 7 and 8. A lead pipe 9 is located in the channel 7 on each flange. 10 are the plates which are supported by the frame-work of the sky-light. The plates 10 rest upon the lead cushioning devices 9. Any soft metallic contrivance may be used for cushioning the plates. Copper may be substituted in place of the lead or an elastic tube may be used. Lead pipes, however, are found to be preferable. A spring 11 extends over the top of the web 4 and extends downward on either side of the web and between the edges of the plates 10 on which they elastically operate tending to move the plates laterally, which will be done if the opposing pressure on the plates 10 is removed. The springs 11 are located along the beams from point to point, the springs of one beam tending to push the flanges against the spring of the adjoining beams where the construction just described is also found. The springs 11 are held in position by means of the threaded rod 12 which is mounted on top of the flange 4. A long spring cap 13 is placed above the web 4 and the edges of the plates and is adapted to elastically press the plates 10 against the cushioning devices 9. The spring cap 13 is held in position by means of the nuts 14 which may be screwed down upon the bolt 12 and compress the top of the spring cap and cause it to slightly spread when it presses against the plates 10. The plates 10 extend from beam to beam of the frame work of the sky-light. Any number of beams and rows of plates may be used according to the size of the area which is to be covered, each beam being made substantially in the same manner as the beam that has just been described.

The plates of any one row and between each successive beam are separated from each other and partly supported by the cross piece. In the preferred form of my invention I use a cross piece of copper plate which not only is not easily affected by the weather, but also forms a cushioned surface against which the edges of the plates may press without breaking.

Referring to Fig. 1, 20 is the copper plate which is bent over in the form of a clip and back again and below the adjoining plate and into a trough. A plate 20 extends downward as at 21 and upward as at 22 and over the end of the lower plate and downward as at 23 over the top of the plate and back again as at 24 and between the edges of the lower and the upper plate upward along the bottom of the upper plate as at 25 and then into a trough 26. The cross piece is placed upon the lower plate. It may be sprung into position. The upper plate is placed above the portion 25 and because of the angular position of the beam its lower edge presses against the copper at 24 which cushions the glass and prevents breaking thereof. The portion 21 collects any rain that may be driven upward under 23 while the trough 26 collects any moisture that may be condensed on the lower side of the upper plate. The plates extend to the beams on either side and are supported by the flanges 6 and they may be supported in part by the channel iron 1. The troughs 21 and 26 extend over into the channel or trough 1 and the moisture that is collected in the cross troughs will flow into the troughs of the beams, from thence they will be conducted down and away from the building. Furthermore the channel 8 of the flanges 6 will collect and discharge in the same manner any moisture that may occur beneath the cap 13 and between the edges of the plates. A strip of lead or other soft material 27 may be also placed between the supporting plate 20 and the upper glass plate in order to cushion the upper glass plate.

The beam 1 may be supported in any manner well known. 30 is a curb having an apron 31 which is secured to the beam and to the top of the building by means of the bracket 32 and the bolt 33. An angle iron 34 is also attached to the building by means of the bolt and bracket. A housing 35 is secured to the angle iron 34. The housing 35 has a recess 36 in which the end of the beam 1 is inserted. The beam 1 is flat and rests on the bottom of the housing. A beam may be rested upon any other beam if desired, the flat bottom of the beam 1 making it convenient for that purpose. Channel iron 1 extends through the housing 36 as shown in Fig. 4. The flanges 3, 3 of the channel iron is cut downward a short distance at their ends as shown in Fig. 3. The remaining portion 37 of the channel iron extends outward through the housing which permits delivery of the collected moisture away from the building. The housing is provided with an end plate 38 which is provided with two openings 39 that register with the channels 8 of the flanges 6. The moisture which is collected by the channels 8 is delivered through the openings 39 and on to the protruding channel 1 and away from the building. Furthermore the openings and channels ventilate the interior of the caps.

The beam is supported so that the support and itself may be moved with respect to each other. This is to provide for changes in temperature and also to provide for any vibration that may occur, such as is common in very high buildings and in factories and the like. The beam rests on the angle iron 34 and extends through, in each case, an opening. A portion of the beam rests against the

housing placed over the opening, while another portion of the beam extends through or under the housing. The portion that extends through or under the housing is the lower part of the trough of the beam and by reason of the outwardly extending trough and housing, the moisture is discharged free of the structure. The extension of the trough beyond the housing causes the discharge of the moisture from the openings in the housing, which register with the channels of the flanges of the beam, since the moisture therefrom will drip down upon the trough and be carried away by the free flow of discharge of condensations coming through the trough. If desired the housing may be extended downward so as to completely inclose the beam except for the extended portion of the trough, but I find it preferable to strap the upper portion of the beam to the angle iron, in the manner shown. The beam is moreover movable with respect to the housing 36. The upper end of the beam is supported on the ridge 40 which may be supported in any manner well known in the art. The angle iron 41 is secured to the ridge 40. The angle iron 41 is provided with a slot 42. A bolt 43 passes through the slot and is secured to the beam 1. This permits the ridge to rise or fall allowing free play in case of expansion or contraction and also it allows the beam to move up and down relative to the slotted iron 41. A space is allowed between the ends of the beams at the ridge or between the ends of the beam supporting the skylight and any frame-work that may be located in that portion of the construction. The ends of the beams are covered with a cap 50 which extends along the ridge. The cap 50 is secured in position by means of the screws and bolts 12 and 14.

The ends of the lower plate in each row are supported in parts on the soft metal strip 60 which is provided with two flanges 61 that clip over the angle iron 34. The strip 60 may be also provided with a trough 62 which is adapted to collect the moisture of the plate and direct it to the channels 1 located at the ends of the trough 62.

The invention may be modified by those skilled in the art without departing from the spirit thereof.

The ideas here suggested may be contained in structures of many kinds and differing very materially from each other and erected for different purposes and yet being within the scope of what I claim to be new and for which I make application for Letters Patent.

What I claim as new and desire to secure by Letters Patent is as follows:—

1. In a sky-light the combination of a supporting beam comprising cross webs formed from a single piece of sheet steel, glass plates having their edges supported by one of said webs, a cap attached to another of the said webs, and adapted to cover the edges of the said plates, springs located intermittently along the said web and between the edges of the said plates for elastically holding plates away from the said web, the first named web having channels located on opposite sides of the second named web and adapted to drain the space formed between the caps and the edges of the plates.

2. In a sky-light the combination of a beam comprising cross webs rolled into a single piece from steel and a square trough attached to the bottom portion of one of the said webs, plates adapted to be supported by the other of the said webs, a cap adapted to be supported by the first named web and for covering the edges of the said plates, the other of the said webs having channels adapted to drain the space formed between the edges of the said plates, the said cap and the said webs, springs located at intervals along the first named web and adapted to elastically hold the plates away from the said named web, cross troughs located on the ends of the said plate and adapted to feed into the trough of the said beams.

3. In a sky-light the combination of a beam comprising cross webs rolled into a single piece from sheet steel, a trough secured to the lower end of one of the said webs, a housing for supporting the said trough and adapted to extend around the sides of the said trough and over the bottom of the trough whereby the water is conducted away from the building and from beneath the said housing.

4. In a sky-light the combination of a beam comprising cross webs rolled into a single piece from steel, a trough attached to one of the webs, a housing adapted to support the said beam, the said housing forming a socket extending around the sides of the said trough, the said cross web and a portion of the end of the said trough adapted to rest against the said housing, the bottom of the said trough extending underneath and away from the said housing adapted to deliver the moisture in the trough away from the said housing.

5. In a sky-light the combination of a beam comprising cross webs, one of the said webs adapted to support the plates, a cap located on the other of the said webs and adapted to cover the edges of the said plates, the first named web having flanges located on opposite sides of the second named web and adapted to drain the space between the said plates, the said webs and the said cap, a trough having a rectangular cross section attached to the second named web and adapted to collect the moisture condensed on the said plates, a housing located around the end of the said cross web and around the end of a portion of the said trough and adapted to close the end of the said cap, the said hous-

ing having openings adapted to register with the said channels, cross trough extending along the ends of the said plates and adapted to feed into the first mentioned trough.

6. In a sky-light the combination of a beam comprising cross webs and a trough having a rectangular cross section, plates adapted to be supported by one of the said webs, a ridge having angle irons on opposite sides of said trough, the upper end of the said beam being provided with a slot, a bolt located in the said slot and in the said angle irons, and a housing forming a socket located around the end of the said web and a portion of the end of the said trough and over the bottom of the trough, whereby the supporting ways may vibrate without causing vibration of the said sky-light.

7. In a sky-light the combination of glass plates, a beam having a vertical web and side flanges, a trough adapted to support the said web and the said flanges, one edge of the said web resting upon the bottom of the said trough, brackets for securing the said web to the sides of the trough, lead pipes located between the said plates and the said flanges, springs located between the edge of the said plates and adapted to hold the said plates away from the said web, a cap adapted to cover the said web and the edges of the said plates, a housing and an angle iron for supporting the said beam, the said beam extending through the said angle iron and resting against the said housing, a portion of the said beam extending beyond the said housing, the said housing having openings adapted to register with the said channels.

8. In a sky-light the combination of glass plates, a beam having a vertical web and side flanges, cushion devices located between the said flanges and the said plates, a cap adapted to cover the edges of the said plates, springs having re-curved ends, the said ends being located between the edges of the plates and the said web and adapted to elastically hold the said plates.

9. In a sky-light the combination of plates, a beam having a trough adapted to support a plurality of plates, metallic troughs located along the edges of the plates transverse to the said beam, the said transverse troughs having a portion located on the upper side of the said plates and a portion located on the under-side of the said plates and adapted to elastically compress the under-sides of the said plates, the said troughs also having a cushion device located on the under-sides of the said plates for cushioning the lower edge of the said plates, the said transverse troughs adapted to feed into the said trough of the said beam.

10. In a sky-light the combination of a plurality of plates, a beam for supporting the said plates having a trough, a plurality of transverse troughs located transverse the said beam and at the transverse edges of the said plates, each trough being supported by an elastic edge portion adapted to compress the lower side of a lower contiguous plate and a returned portion located on the upper side of the said lower plate and a portion extending between the said plates and underneath the lower side of the upper plate, the said last named portion having a cushion device adapted to press against the lower side of the upper plate and support the said plate, the said trough adapted to collect the moisture drained from the lower side of the said upper plate and feed into the trough of the said beam.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

BENJAMIN STORCH.

Witnesses:
F. F. CRAMPTON,
M. A. BUTLER.