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ABSTRACT

A building structure is provided having a combination of a support post with a beam having a generally triangular cross-sectional shape with outwardly directed longitudinally extending flanges at the base and a channel formed along the peak of the beam, roofing sheets on the beam which is supported by a support post which is a rolled rectangular cross sectioned sheet metal component each side of which has a centrally located longitudinally extending stiffening channel formed therein. There is also provided a wall plate between the post and the beam, the wall plate comprising a component rolled to generally channel cross-section one flange of which has an outwardly extending step terminating in a section extended parallel to the channel flanges, and for the flanges to be inclined to the web of the channel. The webs of the channel section of the wall plate has punched tongues projecting outwardly therefrom and which engage the flanges on the beam and the free end of the extended section terminates in a rolled glazing channel.

AUSTRALIA

Patents Act 1990

COMPLETE SPECIFICATION

STANDARD PATENT

Applicant(s):

Dalmain Frederick UNTIEDT

Invention Title:

BUILDING STRUCTURE

The following statement is a full description of this invention, including the best method of performing it known to me/us:

"BUILDING STRUCTURE"

FIELD OF THE INVENTION

This invention relates to a building structure using a beam of the kind set forth in my United States Patent No 5,390,453 entitled "Structural members and structures assembled therefrom".

BACKGROUND TO THE INVENTION

The detailed disclosure of the beam described and claimed in the specification of the above patent is to be considered included in this specification and that description will not be repeated here. The beam is of generally triangular cross-sectional shape and has outwardly directed longitudinally extending flanges at the base while a channel is formed along the peak of the beam. Roofing sheets with downwardly bent hook shaped ends engage in the channel which is shaped so that the hooked shaped ends cannot be easily retracted. Ceiling panels can be supported on the flanges and the beams are, in use, secured to wall plates, beams or supporting posts.

The beams are used to act as rafter frameworks and are particularly but not exclusively suited for low cost housing using unskilled labour in the building of such housing. Nevertheless the nature of the materials used for the components are such that care and some skill is required in the erection of building structures therefrom and it is the object of the present invention to provide means whereby not only is erection made easier but also efficiency and aesthetic appearance of the building improved.

SUMMARY OF THE INVENTION

According to this invention there is provided a building structure comprising a combination of a support post with a beam having a generally triangular cross-sectional shape with outwardly directed longitudinally extending flanges at the base and a channel formed along the peak of the beam, roofing sheets on the beam which is supported by a support post which is a rolled rectangular

cross sectioned sheet metal component each side of which has a centrally located longitudinally extending stiffening channel formed therein.

A further feature of this invention provides for the post to have keying tongues punched from the web of each channel. The invention also provides for the combination to include a wall plate comprising a component rolled to generally channel cross-section one flange of which has an outwardly extending step terminating in a section extended parallel to the channel flanges, and for the flanges to be inclined to the web of the channel.

Still further features of this invention provide for the webs of the channel section of the wall plate to have punched tongues projecting outwardly therefrom and which engage the flanges on the beam and also for the free end of the extended section to terminate in a rolled glazing channel.

The invention also provides for the free ends of the flanges to have clips punched therefrom engaging the upper edges of the openings formed by the punching of the tongues from the sides of the posts.

Yet further features of this invention provides for the combination to include a gutter assembly comprising a channel section with one flange longer than the other which flange terminates in an inwardly directed lip engaging under a lip formed on the end of the roofing sheet and the web having a supporting bracket hooked into the base of a beam.

Also the free flange end is rolled to form a strengthening bead along the length of the gutter.

The combination may also include a fascia panel having oppositely directed flanges at each end inclined to the panel one flange secured to the end of the base of the beam and the other engaged by a lip on the end of the roofing sheet.

Another feature of this invention provides for a glazing panel to be included in a structure providing a clear storey lighting arrangement, the glazing panel being rolled from sheet metal with one edge shaped to clip over a lip on the end of a

roofing sheet and provide a glazing channel above and adjacent the end of the roofing sheet with the other end of the panel extending at an inclination away from the bottom of the glazing channel and located on the roofing sheet.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of this invention will become apparent from the following descriptions of examples of the components wherein reference is made to the accompanying drawings in which:

Figs 1 and 2	combined along line A-A show a vertical section through part of a building structure designed to provide clear storey lighting; (ringed inserts depict details of the assembly on an enlarged scale); and
Fig 3	shows a detail of a glazing panel.

DETAILED DESCRIPTION OF THE DRAWINGS

As illustrated the building structure indicated generally at (1) shows an assembly of beams (2) of the kind referred to mounted on wall plates which are themselves mounted on the ends of support posts (3) to provide a glazed storey lighting arrangement (4).

Each support post (3) has a transverse cross-section conforming to a rectangular and preferably square shape each side of which has a centrally located longitudinally extending channel (5) formed therein. The post (3) is rolled from light gauge steel sheet with the abutting ends of the sheet secured down one corner.

A series of tongues (6) are punched from the web of each panel.

The post (3) of the above design utilises a high proportion of the intrinsic strength of the metal sheet from which it is used and is designed to carry four times the weight of a module of the roof construction.

The tongues (6) are used to key brickwork, plastering and concrete to the posts.

An opening left by the punched tongue adjacent the top of the post is used to locate and secure tongues from a wall plate (7) reducing the risk of the roof being blown off during heavy wind conditions.

The wall plate (7) is a component also rolled from metal sheet. It has a generally channel cross-section (8) with one flange (9) having an outwardly extended step (10) terminating in a section (11) parallel to the channel flanges. The flanges are inclined to the web as shown to accommodate the required pitch of the beams (2) in the roof structure.

The wall plate (7) is designed to fit over the top of a wall and posts (3). This allows a good finish between the wall and ceiling to be obtained. The wall plate (7) could be designed to include a cornice if required.

By appropriately selecting the depth of the vertical section the wall plate can span different spaces between support posts (3) and become load bearing components between the parts of the wall plates positioned over support posts (3). This then allows the roof to be constructed first and the wall later. This procedure enables construction to proceed under the protection of the roof during inclement weather thereby improving productivity and reducing costs.

The space afforded by the channel (8) below the beam facilitates the location and fixing of timber frame or concrete panels and ensures that the wall is straight. The downwardly extending vertical parts of wall plates, being section (11) and flange (12) of channel (8) allow strategically placed clips (13) to be punched from the sheet metal. These clips (13) engage the upper edges of the openings adjacent the top support posts (3) left by the tongue (6) to secure the wall plate to the post.

To locate the beam (2) on the wall plate (7) keying tongues (13) are pressed from the web of the channel (8) to engage the flanges projecting from the base of the beam (2). These lugs (13B) prevent lateral and longitudinal movement of the

beam (2) relative to the post (3) and also retain the beams against lifting from the top of the posts.

By forming narrow reverse channels (13A) at the lower edge of the extended vertical sections (11) provision is made for glazing in the clear storey lighting situation illustrated. Substantial savings are made in that special window frames will not be required to retain the glass panes.

A gutter assembly for the roofing structure is indicated generally at (14). This provides a channel section with one flange (15) longer than the other. The flange (15) terminates in an inwardly directed lip (16) which engages under a lip (17) formed on the end of a roofing sheet (18).

The web of the channel is carried on a supporting bracket (19) which is securely hooked into the base of the beam (2).

A bead (20) is formed along the free end of flange (21) to strengthen the gutter. No bolts or other fastening devices are necessary.

The construction ensures that the gutter not only collects rain water from the roof but also closes the space between the roofing sheets (18) and ceiling panels (not shown) supported between adjacent beams (2) on the flanges of the beams as mentioned above. It also acts as a buttress for ceiling panels so that these panels do not have to be otherwise secured to the sloping beams (2).

The structure also includes a fascia panel (22) consisting of a sheet of metal having oppositely directed flanges (23) and (24) along the edges. These flanges are inclined to the panel (22). Flange (24) is secured to the end of the base of the beam (2) at (25) and flange (23) is engaged by the lip (17) on the end of the roofing sheet (18). During construction of a roof using beams of the kind referred to difficulties are sometimes experienced in locating the roof sheets (18) over the beams (2) accurately and fixing the roof sheets (18) so that the ends are in line.

The light metal section fascia is placed onto the ceiling panel supporting flanges of the beam (2) and its base. The higher end butts against the peak of the beam. The roof sheets (18) are then hooked by means of lips (17) over the upper flanges (23) of the fascia (22), manoeuvred to bring the roof sheet (18) over the support post (3) accurately and then clipped into the channel along the peak of the support beam (2) and secured. This is mentioned above and described in detail in United States Patent No 5,390,453.

The fascia (22) designed and utilised in this way has a multiple function. It facilitates the fixing of roof sheets. It helps align and stabilise the structure giving it added strength. Also it closes off the space between roof and ceiling and it enhances the appearance of the roof.

To retain the bottom edges (26) of the glass panes (26A) of the clear storey lighting a glazing panel (27) is provided. As shown in Fig 3 on an enlarged scale the panel (27) is rolled from sheet metal to have one edge (28) shaped to clip over the lip (17) on a roofing sheet (18).

A glazing channel (29) is formed adjacent the clip shaped edge with the channel (29) directed upwardly to receive the bottom edge (26) of the glass panel. The remaining portion of panel (27) extends at an inclination following that of the roofing sheet (18).

The panel (27) thus also acts as flashing preventing the ingress of rain into the building.

The invention thus provides a plurality of components interacting to facilitate erection of a roofing structure and provide increased strength and functionability to the assembly as well as resulting in an improved aesthetic appearance.

In this specification, except where the context requires otherwise, the words "comprise", "comprises", and "comprising" mean "include", "includes", and "including", respectively. That is, when the invention is described or defined as comprising specified features, various embodiments of the same invention may also include additional features.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A building structure comprising a combination of a support post with a beam having a generally triangular cross-sectional shape with outwardly directed longitudinally extending flanges at the base and a channel formed along the peak of the beam, roofing sheets on the beam which is supported by a support post which is a rolled rectangular cross sectioned sheet metal component each side of which has a centrally located longitudinally extending stiffening channel formed therein, a wall plate being included between the post and the beam, the wall plate comprising a component rolled to generally channel cross-section one flange of which has an outwardly extending step terminating in a section extended parallel to the channel flanges, and for the flanges to be inclined to the web of the channel.

2. A building structure as claimed in claim 1 in which the post has keying tongues punched from the web of each channel.

3. A building structure as claimed in claim 1 in which the webs of the channel section of the wall plate has punched tongues projecting outwardly therefrom and which engage the flanges on the beam and also for the free end of the extended section to terminate in a rolled glazing channel.

4. A building structure as claimed in claim 1 in which a gutter assembly is secured to the end of the beam and comprises a channel section with one flange longer than the other which flange terminates in an inwardly directed lip engaging under a lip formed on the end of the roofing sheet and the web.

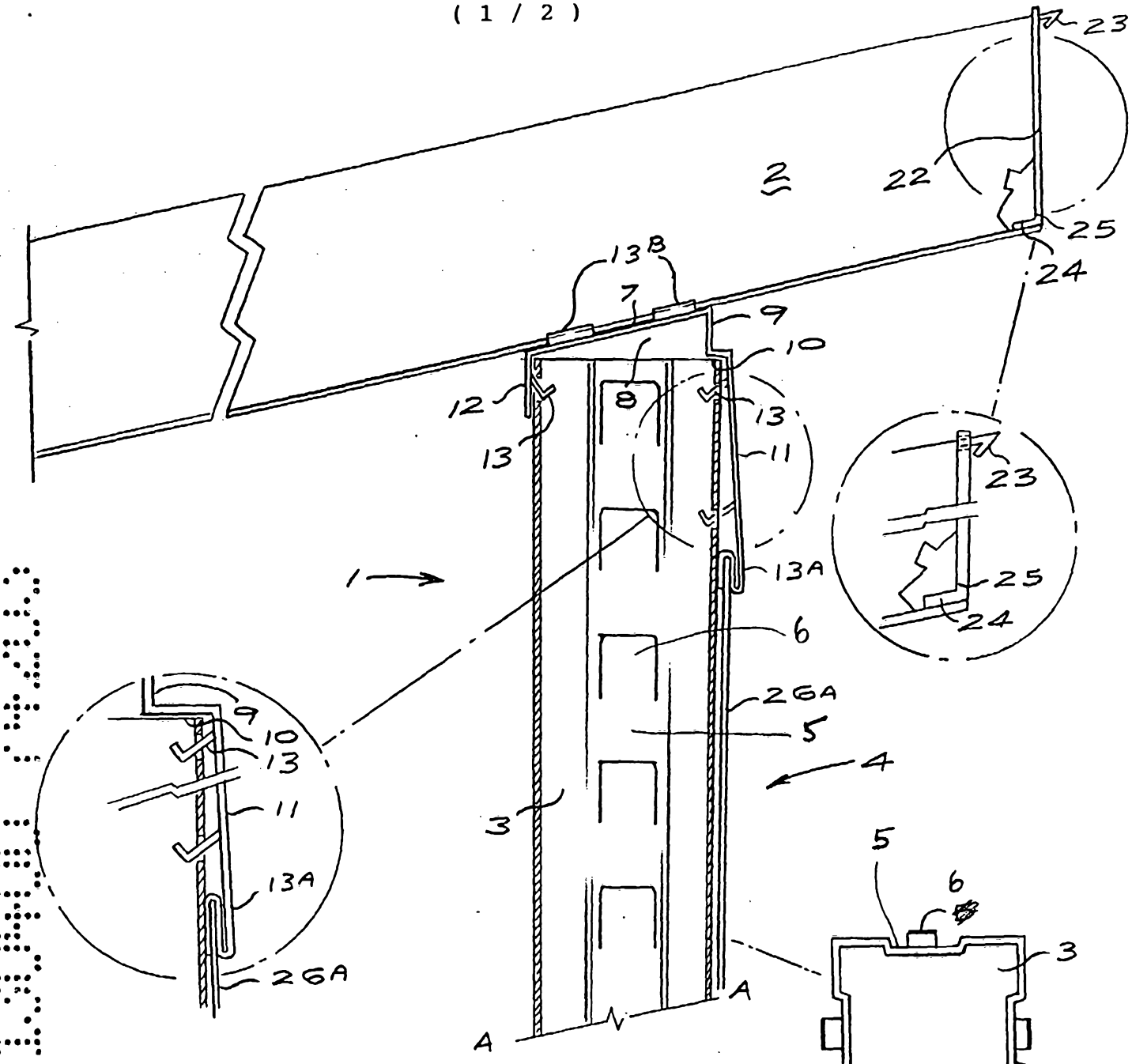
5. A building structure as claimed in claim 4 in which the end of the free flange of the gutter channel is rolled to form a strengthening bead along the length of the gutter.

6. A building structure as claimed in claim 1 including a fascia panel having oppositely directed flanges at each end inclined to the panel one flange secured to the end of the base of the beam and the other engaged by a lip on the end of the roofing sheet.

7. A building structure as claimed in claim 1 in which the structure provides a clear storey lighting arrangement and includes a glazing panel which is rolled to shape from sheet metal to have one end clipped over a lip on the end of a roofing sheet and to provide a glazing channel above and adjacent the end of the roofing sheet with the other end of the panel extending at an inclination away from the bottom of the glazing channel and located on the roofing sheet.

8. A roofing structure substantially as described and illustrated in the accompanying drawings.

Dated this 12th day of April 2000
DALMAIN FREDERICK UNTIEDT
By his Patent Attorneys:
GRIFFITH HACK
Fellows Institute of Patent
Attorneys of Australia.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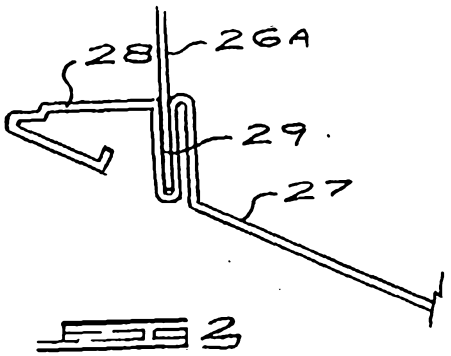
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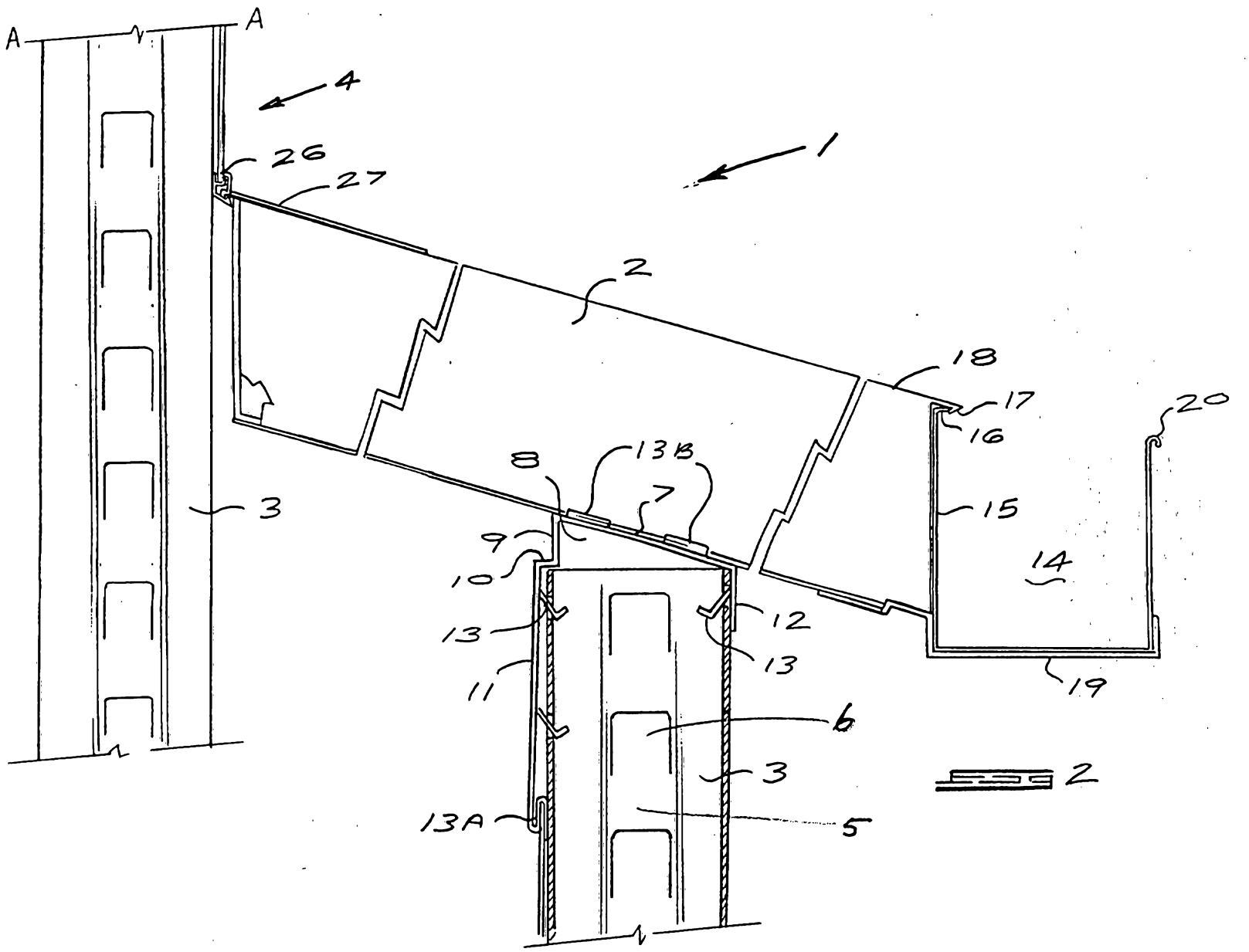

Fig. 2