Dec. 21, 1954 A. T. TYREE 2,697,407

ROOF ASSEMBLY AND ANCHOR CONSTRUCTION

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Fig. 1

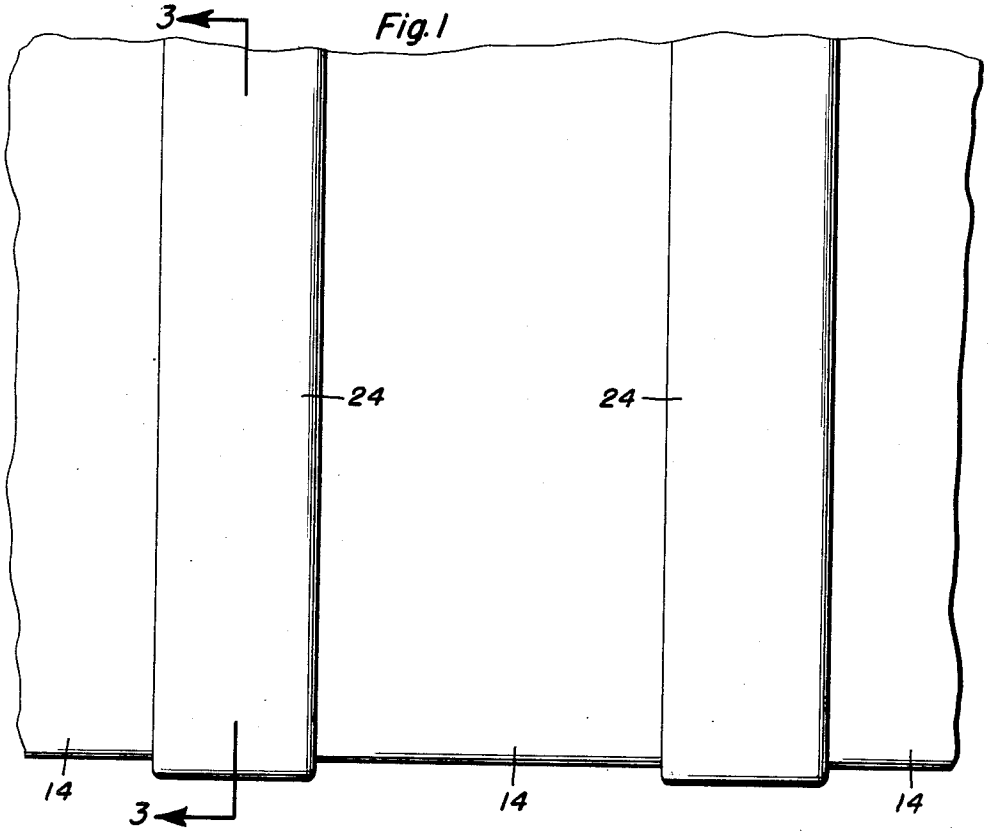
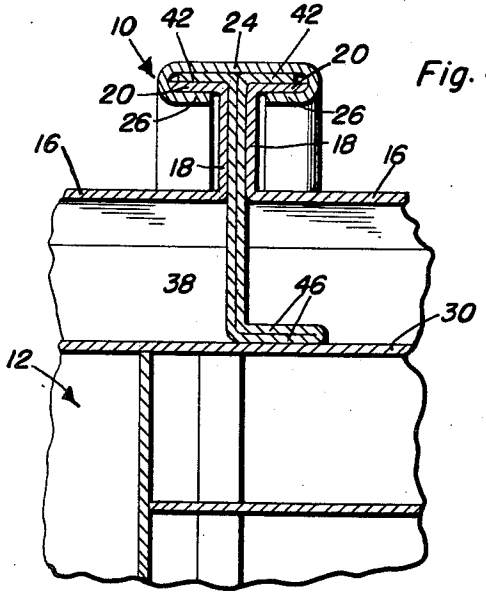


Fig. 4



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Fig.2

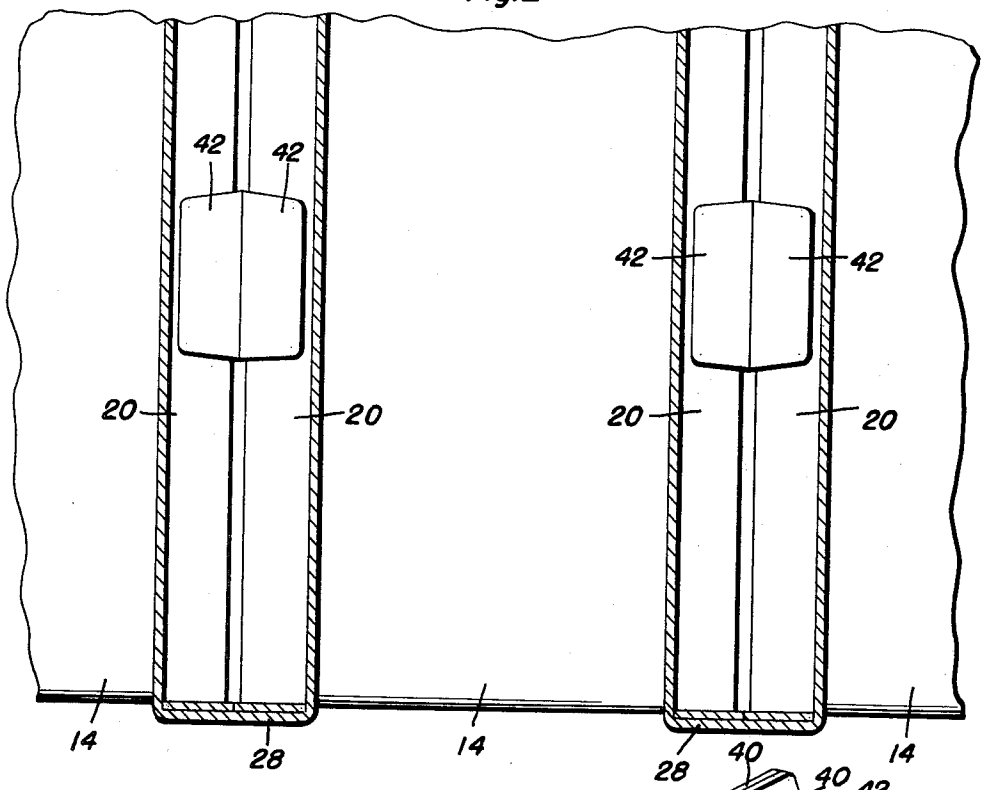


Fig.6

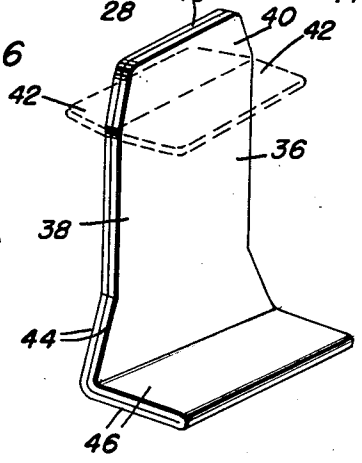
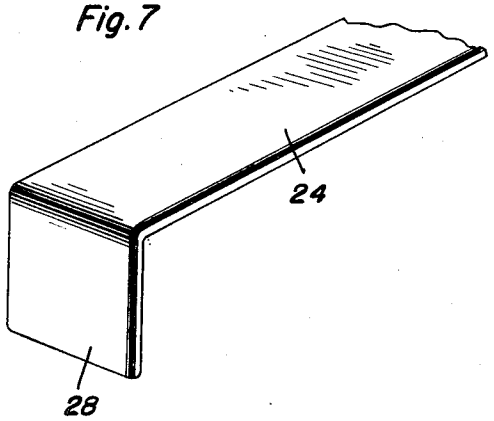


Fig.7



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Fig.3

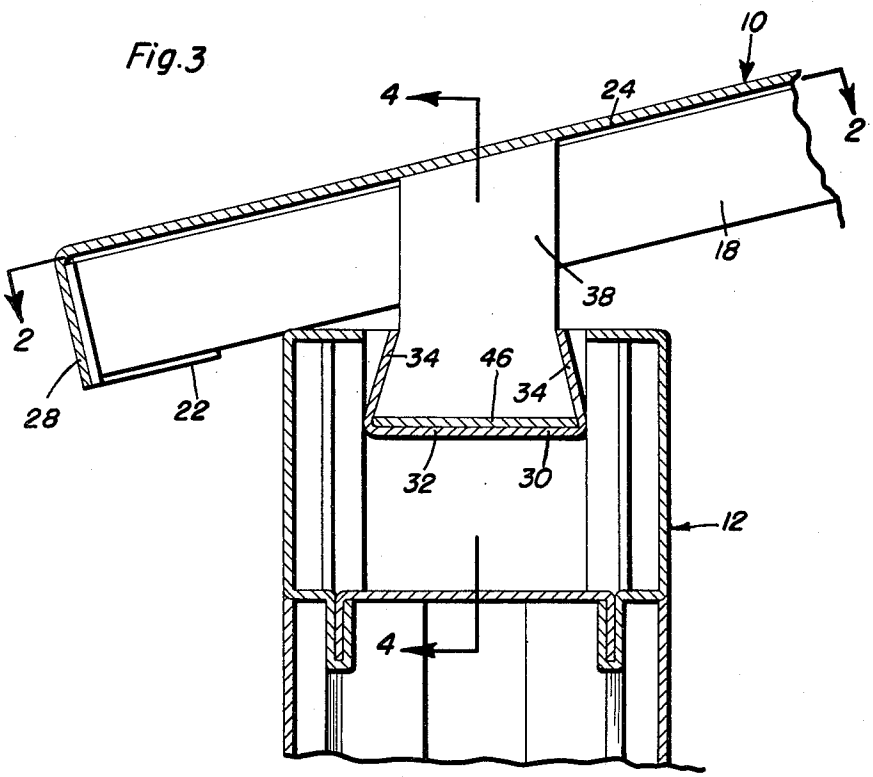
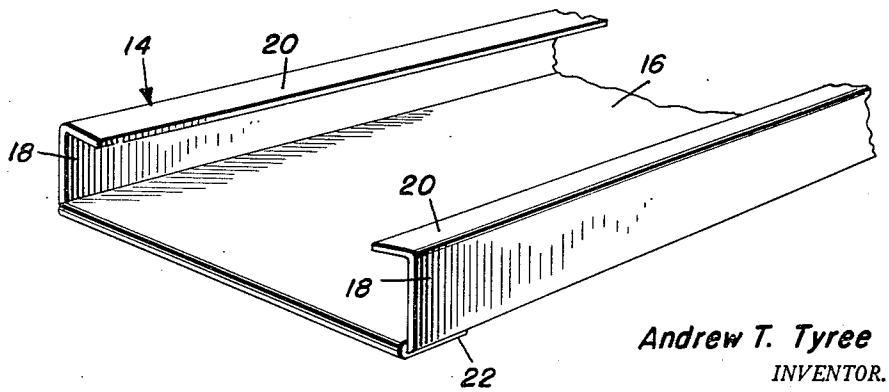


Fig.5



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2,697,407

ROOF ASSEMBLY AND ANCHOR CONSTRUCTION

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Application June 3, 1952, Serial No. 291,500

6 Claims. (Cl. 108—1)

This invention comprises novel and useful improvements in a roof assembly and anchor construction, and more specifically relates to an improved fastening means for retaining the sections of a sheet metal roof to each other and to a wall structure.

The primary object of this invention is to provide an anchor or fastening construction by means of which the components of the roof and wall of a sheet metal building may be quickly, securely and permanently fastened and united to each other in a manner which will admit of ready and quick detachment and disassembly of the various components when desired, which will utilize only inexpensive sheet metal materials, which will eliminate the necessity for employing rivets, bolts or similar fasteners, and which will greatly reduce the amount of labor and effort required to assemble or disassemble a sheet metal building structure having sectional components.

A further important object of the invention is to provide an anchor clip of a very simple and inexpensive construction, which may be readily formed by mass production from sheet metal, which may be quickly and securely applied to the components of a roof assembly and may be readily removed therefrom when desired; and which shall have a secure, but sliding connection with an anchor member carried by a wall structure for securing the roof structure thereto.

Yet another specific object of the invention is to provide a roof anchor clip which may be securely anchored in an anchor channel member carried by a wall structure and while anchored therein may be readily slidable longitudinally thereof in order to position the clip at a desired location; and wherein the clip is secured to a sectional roof construction in an improved manner.

These, together with various ancillary features and objects of the invention, which will later become apparent as the following description proceeds, are attained by the present invention, a preferred embodiment of which has been illustrated, by way of example only, in the accompanying drawings, wherein:

Figure 1 is a fragmentary top plan view of a sheet metal roof construction in which a plurality of standard roof sections have been locked to each to form a rigid and reenforced roof assembly in accordance with this invention;

Figure 2 is a horizontal sectional view taken substantially upon the plane indicated by the section line 2—2 of Figure 3 and showing the manner in which the sheet metal roof sections are associated with each other, and in which the anchor clip is secured to the roof sections;

Figure 3 is a vertical transverse sectional view through the roof structure, being taken substantially upon the plane indicated by the section line 3—3 of Figure 1 and showing in particular the manner in which the anchor clip is associated with the components of the roof structure and with the roof anchor channel carried by the wall structure;

Figure 4 is a vertical longitudinal sectional view taken substantially upon the plane indicated by the section line 4—4 of Figure 3 and further showing the manner in which the roof anchor clip is received within the roof anchor channel of the wall structure and is associated with and secured to the sheet metal roof components and retained in fixed relation thereto by a locking clip;

Figure 5 is a fragmentary perspective view showing the construction of one of the channel members which forms one of the standardized components of the roof structure for which the present is particularly applicable;

Figure 6 is a perspective view of one of the roof anchor clips, the same being shown in full line in its position prior to assembly, and in dotted lines in its position when applied to the roof components for securing the same to the wall structure; and

Figure 7 is a fragmentary perspective view of the lower end of one of the roof locking strips.

Referring more specifically to the accompanying drawings, wherein like numerals designate similar parts throughout the various views, it will be seen that the present invention as illustrated in the drawings provides a novel and improved means whereby a roof structure indicated by the numeral **10** is detachably but firmly secured to a wall structure indicated generally by the numeral **12**. While it will be appreciated that various features of the invention are readily applicable to different types of roof structures and wall structures than those shown herein, it is thought that the principles of the invention will be readily appreciated and understood by consideration of the roof and wall structures which are illustrated in the drawings as an exemplification of this invention.

In the roof structure shown, the same is composed of a plurality of standard, inexpensive sheet metal components, which may be of aluminum or any other suitable material, each of the roof components as illustrated consisting of channel members **14**, see Figure 5, each of these channel members including an elongated web portion **16** having upstanding marginal side walls **18** which at their upper end are provided with inturned perpendicular flanges **20** which are disposed in parallel relation to and overlie the web portion **16**. In addition, each of the channel members **14** at one of its ends which may be termed its lower end, has the web portion **16** extending beyond the extremities of the side walls **18** and this extending portion is folded back under the web as at **22** to provide a stiffening and reenforcing member for the lower end of the channel member.

As shown best perhaps in Figure 4, the roof structure is formed by placing the plurality of channel members **14** in a side-by-side relation, with the side walls **18** of adjacent channel members being juxtaposed, while an elongated channel member **24** constituting a locking clip and having its marginal edges inturned over the main portion of the clip to provide locking flanges **26** is slid longitudinally over and embraces the oppositely extending inturned flanges **20** of the juxtaposed side walls **18**, for thus locking and securing the side walls and inturned flanges into a fixed but releasable engagement with each other. One end of these locking clips, at what may be termed the lower or outer end of the same, as shown in Figure 7, is downturned in an angular maner to provide an end portion **28**, see also Figures 2 and 3. By this means, the locking strips are slid longitudinally from the lower end of the channel members of the roof upwardly along the same until the end portion **28** abuts against the lower ends of the roof channel members. It will thus be readily seen that the roof channel members are assembled solely by the sliding embracing engagement of the locking clips, and may be disengaged in the same manner. There is thus avoided the heretofore common disadvantage of rivets or bolts which tend to become rusty, corroded or otherwise difficult to apply and remove; and the components of the roof may be readily assembled or disengaged with a minimum of labor and under adverse working conditions as for example when the worker is compelled to handle the strips in windy weather while standing upon a ladder or the like.

Attention is now directed more particularly to Figures 3 and 4, wherein it will be seen that the wall structure **12** which may be of any desired character such as for example as that set forth in my copending application, Serial No. 296,540, filed July 1, 1952, for Wall and Stud Construction, it being necessary that this wall structure shall have secured in the upper end of the same a roof anchor channel **30**. This anchor channel has a flat bottom wall **32** from the marginal edges of which are provided upstanding inwardly sloping or converging side walls **34**. The upper ends of these side walls terminate in spaced relation from each other to provide a slot or open top for the anchor channel member. The latter may be of any

suitable material and is anchored or secured in the wall structure 12 in any desired manner. When properly installed, however, it is preferred to have the open top wall of the anchor channel member and the upper edges of its side walls disposed in a flush relationship with the top surface of the wall structure.

In order to detachably secure the roof structure to the roof anchor channel and thereby to the wall structure, there is provided an improved and novel fastening means in the form of an anchor clip. It is obvious that this anchor clip could be formed of various desired materials, either metallic or plastic or the like, and might be formed as a unitary rigid block molded or otherwise fabricated into the shape desired; but in the interest of economy of construction, and ease of installation, it is preferred to form the same as an elongated flat strip of bendable material such as galvanized iron, aluminum or the like. This anchor clip, as will be best apparent from Figures 4 and 6, is folded at its mid-portion to provide a double thickness of material, the two ends of the clip being preferably substantially coextensive and coterminus. As shown in Figure 6, the anchor clip 36 as delivered ready for installation consists of an elongated stem portion 38 consisting of two thicknesses of material, this stem portion having its two extremities 40 being adapted to be bent outwardly in opposite directions as indicated in dotted lines at 42 in Figure 6. The base portion of the clip is provided by forming the side edges of the two thicknesses of material constituting the stem 38 in a divergent relationship, these edges being indicated at 44. From the base portion of the clip, the double thickness of material is bent to provide perpendicular horizontally extending flanges 46. The flanges 46 are adapted to rest upon the bottom wall 30 of the anchor channel member, as shown clearly in Figures 3 and 4, while the stem portion 38 extends upwardly through the slot or open top of the roof anchor channel member.

It should be here noted that the base portion of the anchor clip is of the same shape and contour as the cross-sectional shape of the roof anchor channel, as will be apparent from Figure 3. Thus, the edges 44 of the anchor clip base are snugly received within and slidable longitudinally of the anchor channel and along the inner surface of the inclined side walls 34 thereof. Similarly, the stem 38 is of sufficient width to be snugly received in the opening between the upper edges of the side walls, whereby the anchor clip while movable longitudinally of the anchor channel cannot twist therein by virtue of the flanges 46, and cannot be withdrawn therefrom except longitudinally from the end of the anchor channel.

In addition to be slidably connected to the roof anchor channel member of the wall structure, the anchor clips are also detachably but fixedly secured to the roof structure. For this purpose, the stem portion of the clips is extended upwardly between the juxtaposed side walls 18 of adjacent channel members 14 of the roof structure, as shown in Figures 2 and 4, and the bendable end portions 40 of the clips are then bent laterally outwardly therefrom into the horizontal position shown at 42 whereby these laterally extending end portions rest upon the top surface of the inturned flanges 20 of the channel members 14.

It will now be apparent that the locking clip when applied as hereinbefore set forth would embrace the outturned end portions 40 as disposed in the position 42 and the inturned flanges 20 and will lock these parts securely together, will reenforce and brace this joint or connection and will cover and protect the joining elements against the effects of the weather.

It will be particularly noted that this construction eliminates entirely the use of rivets, bolts or equivalent fasteners; eliminates the necessity for punching holes in the components of the roof, wall or the anchoring clips or fasteners; and insures that the components may be readily disassembled even after long usage because of the ease of manipulating the fasteners and engaging or disconnecting the same. It will be further noted that since the anchor clips are readily slidable along the roof anchor channel member, they may be easily positioned at any place necessary in order to engage the roof components. Still further, since the shape of the base portion of the clip conforms to the dove-tailed shape of the roof anchor channel it is evident that a firm lock is provided which will effectively prevent movement of the roof towards or from the wall structure. It will be further observed that the parallel side edges of the flanges 46 on the base of the anchor clip would slide along the inside surfaces of the inclined side walls 34 of the anchor channel member and thus will prevent twisting of the anchor clip in the anchor channel member, and will maintain the stem of the clip in a perpendicular or transverse position with respect to the longitudinal axis of the anchor channel member.

Still further, by virtue of the function of the locking clip 24, the bendable end portions 40 of the anchor clip are prevented from disengaging from the inturned flanges 20 of the roof channel members and consequently the entire anchor clip can be of a relatively thin material.

It is of course apparent that instead of both extremities 40 of the anchor clip being utilized simultaneously as overlying retaining members for the roof channel members, it is possible to utilize only one of these extremities for that purpose, where desired.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. An anchor construction for a wall and roof assembly comprising a roof anchor channel member secured to the top of a wall structure, said anchor channel comprising a channel member whose web constitutes a flat bottom wall and whose side walls converge upwardly from the web and terminate in spaced relation to form an open top for the anchor channel, a roof structure overlying the wall structure and the roof anchor channel, anchor clips slidably retained in said anchor channel and secured to said roof structure, said anchor clips having a base portion conforming in contour to the cross sectional shape of the anchor channel and having a stem extending through said open top of the anchor channel.

2. An anchor construction for a wall and roof assembly comprising a roof anchor channel member secured to the top of a wall structure, said anchor channel comprising a channel member whose web constitutes a flat bottom wall and whose side walls converge upwardly from the web and terminate in spaced relation to form an open top for the anchor channel, a roof structure overlying the wall structure and the roof anchor channel, anchor clips slidably retained in said anchor channel and secured to said roof structure, said anchor clip having a horizontal flange on its base portion resting upon said flat bottom wall.

3. An anchor construction for a wall and roof assembly comprising a roof anchor channel member secured to the top of a wall structure, said anchor channel comprising a channel member whose web constitutes a flat bottom wall and whose side walls converge upwardly from the web and terminate in spaced relation to form an open top for the anchor channel, a roof structure overlying the wall structure and the roof anchor channel, anchor clips slidably retained in said anchor channel and secured to said roof structure, said anchor clip comprising a sheet metal strip folded upon itself to provide a doubled thickness of material, the two ends of said strip being secured to said roof structure, the folded mid-portion of said strip comprising a base portion receivable in said anchor channel.

4. An anchor construction for a wall and roof assembly comprising a roof anchor channel member secured to the top of a wall structure, said anchor channel comprising a channel member whose web constitutes a flat bottom wall and whose side walls converge upwardly from the web and terminate in spaced relation to form an open top for the anchor channel, a roof structure overlying the wall structure and the roof anchor channel, anchor clips slidably retained in said anchor channel and secured to said roof structure, said anchor clip comprising a sheet metal strip folded upon itself to provide a doubled thickness of material, the two ends of said strip being secured to said roof structure, the folded mid-portion of said strip comprising a base portion receivable in said anchor channel, said base portion conforming in contour to the cross

sectional shape of the anchor channel and having a stem extending through said open top of the anchor channel.

5. An anchor construction for a wall and roof assembly comprising a roof anchor channel member secured to the top of a wall structure, said anchor channel comprising a channel member whose web constitutes a flat bottom wall and whose side walls converge upwardly from the web and terminate in spaced relation to form an open top for the anchor channel, a roof structure overlying the wall structure and the roof anchor channel, anchor clips slidably retained in said anchor channel and secured to said roof structure, said anchor clip comprising a sheet metal strip folded upon itself to provide a doubled thickness of material, the two ends of said strip being secured to said roof structure, the folded mid-portion of said strip comprising a base portion receivable in said anchor channel, said base portion conforming in contour to the cross sectional shape of the anchor channel and having a stem extending through said open top of the anchor channel, said anchor clip having a horizontal flange on its base portion resting upon said flat bottom wall.

6. The combination of claim 2 wherein said roof structure comprising a plurality of channel members each having marginal side walls with inturned flanges, said channel members being disposed in side-by-side relation with the side walls of adjacent members being juxtaposed, said anchor clips having stems interposed between the juxtaposed side walls, said stems having their ends bent to overlie and rest upon said inturned flanges, a locking clip slidably embracing and retaining in fixed relation the inturned flanges of said juxtaposed side walls and said ends of said stems.

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