Feb. 10, 1970 W. C. ADAMS ET AL 3,494,082

SUPPORTING FRAME OR SUBSTRUCTURE FOR ROOF OR COVER

Filed Nov. 7, 1968 2 Sheets-Sheet 1

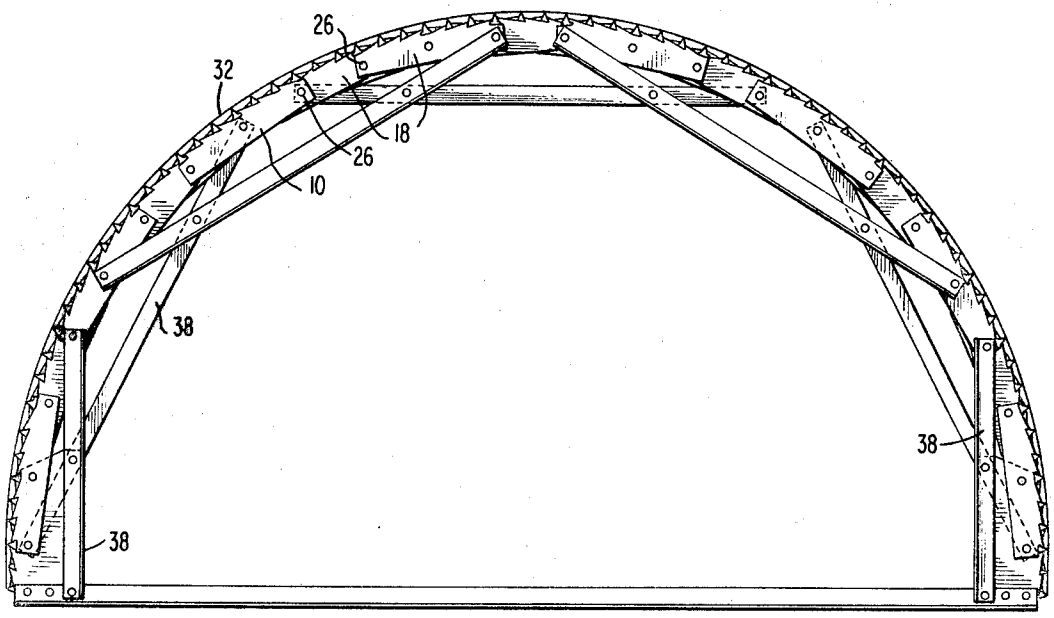


FIG. 1

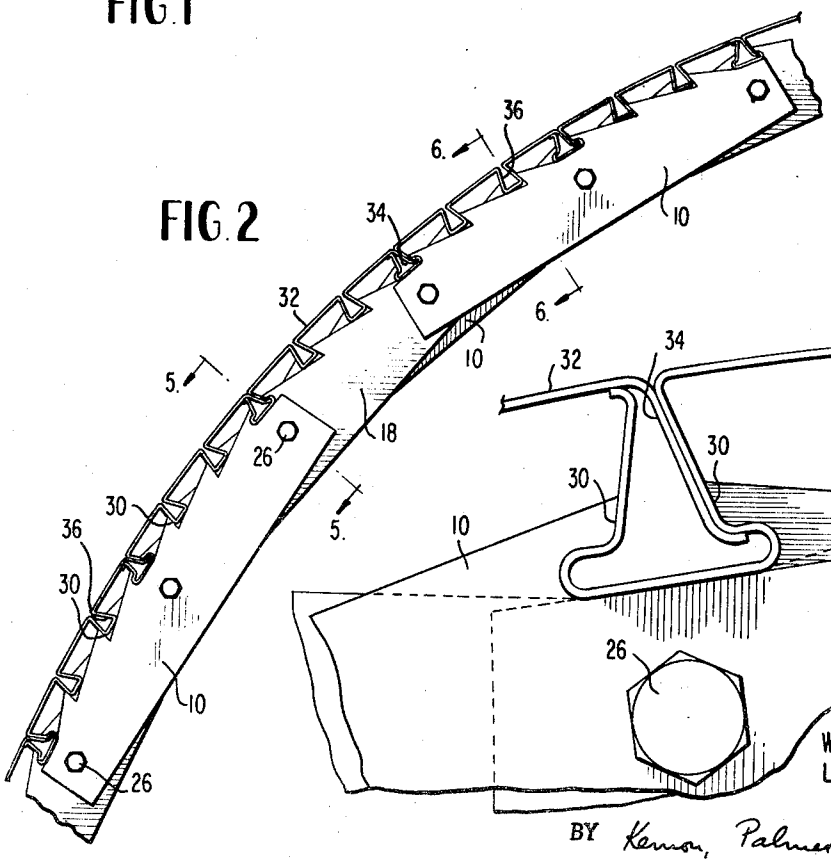


FIG. 2

FIG. 3

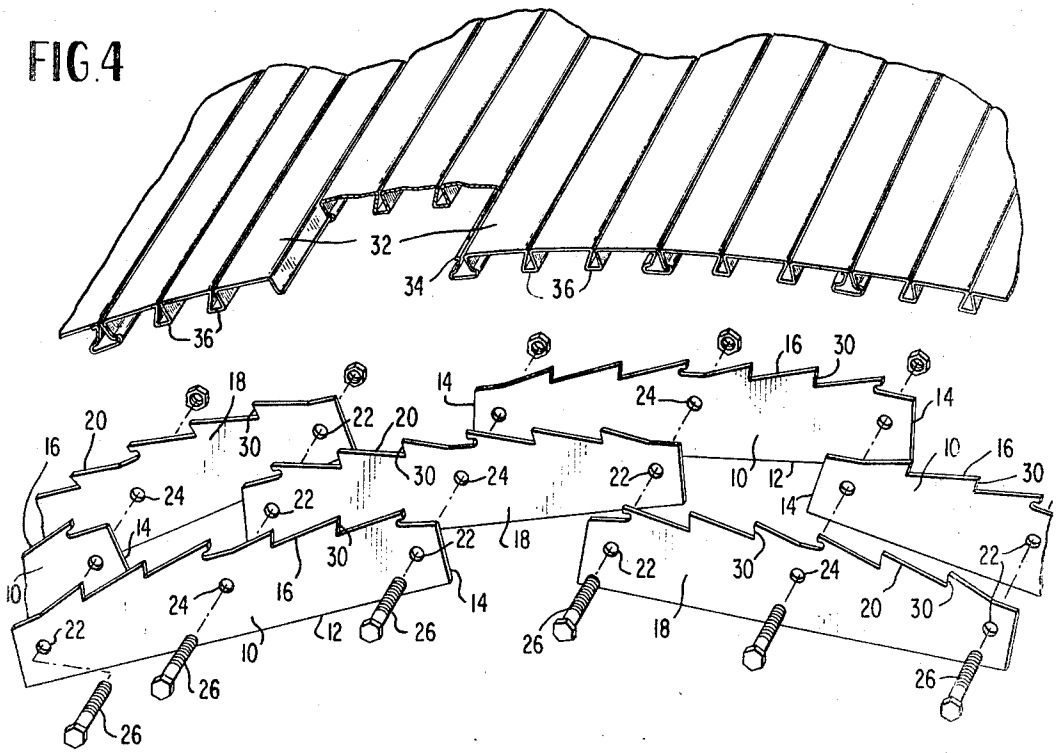
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FIG. 4



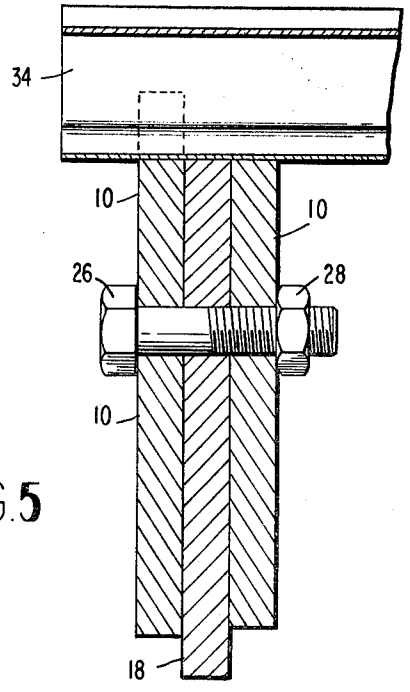


FIG. 5

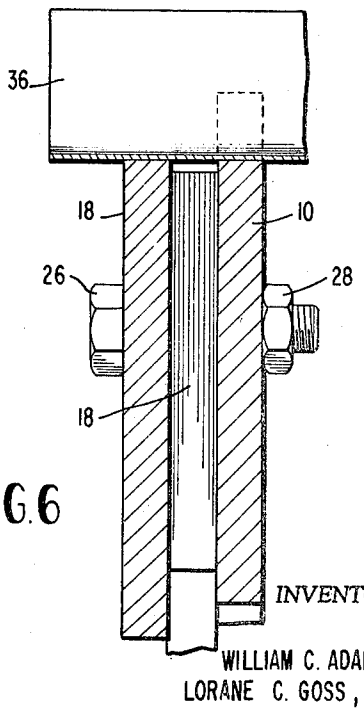


FIG. 6

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SUPPORTING FRAME OR SUBSTRUCTURE FOR ROOF OR COVER

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U.S. Cl. 52—86 5 Claims

ABSTRACT OF THE DISCLOSURE

An elongated relatively thin flat metallic member that is formed with an undulating or ribbed surface on one edge thereof with the diametrically opposite edge surface and ends being substantially flat and smooth. A plurality of said members, when assembled as a unit and connected to adjacent units, tend to define a frame or substructure for supporting a suitable cover. The undulating surface formed on said members constitutes a means by which the cover may be attached thereto in order to form a rigid and sturdy structure .

BACKGROUND OF THE INVENTION

The present invention is readily adaptable to a knock-down type of building or structure which may be readily assembled in the field requiring the use of several conventional wrenches. A building of this type is usually formed from parts that are considered standard and which are capable of being assembled with considerable ease and within relatively short periods of time. Heretofore, certain efforts have been directed to fabricating buildings having an arched roof which is a continuation of the sides and which is typified by the well-known Quonset hut type of structure. In such buildings the substructure could be wooden and the sheathing or panel strips could be secured in place by conventional nails or screws. The efforts that have been exploited in prior art structures have usually dealt with the manner of securing the panels to adjacent panels and to the wooden supporting structure in an effort to produce a rigid and strong structure.

SUMMARY OF THE INVENTION

The supporting frame or substructure of the present invention is formed from a plurality of flat metallic plates that have an undulating or notched surface formed on one edge thereof. A plurality of the plates are arranged in contiguous parallel relation to one another to form what might be considered to be a pack. The plates are provided with a plurality of spaced apertures for the reception of suitable bolts for joining the plates together. The plates are so assembled that the undulating or notched surface of adjacent plates extend or project in opposite directions to one another. This arrangement tends to define a recess or ledge-like abutment that extends transversely of the plates, and constitute the means by which interlocking edges of panel members may be secured to the supporting frame or substructure. The pack or group of plates which constitue the supporting frame or substructure are so joined together that at least one of the plates is arranged in an offsetting relation with respect to the other plates in the pack or group and the offsetting plate or plates become the means by which the plates of one group or pack may be connected to the plates of another group or pack to form a frame member.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is an end elevational view showing a supporting frame with a roof or cover embodying the present invention;

FIG. 2 is an enlarged detailed view of a portion of the structure illustrated in FIGURE 1;

FIGURE 3 is an enlarged detailed view showing a portion of a supporting frame with a portion of a covering panel secured thereto;

FIGURE 4 is an exploded view of a section of the supporting frame and cover illustrated in FIGURE 1;

FIGURE 5 is a cross-sectional view of frame structure and cover of the present invention, the view being taken on the line **5**—**5** of FIGURE 2; and

FIGURE 6 is another view similar to FIGURE 5, the view being taken on the line **6**—**6** of FIGURE 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the FIGURE 4 of the drawings, there is shown an elongated plate member **10** that is formed into substantially flat and smooth bottom and end faces **12** and **14** respectively. The top or upper edge of plate member **10** is formed with an undulating surface **16** that embodies a plurality of spaced notches or rack type of teeth which extend from the left to the right of the plate member as viewed in FIGURE 4. There is also shown in FIGURE 4 an elongated plate member **18** that is formed with relatively flat, smooth bottom and end faces in the same manner as plate member **10**. The top or upper edge of plate member **18** is formed with an undulating surface **20** of the same type as surface **16** on plate member **10** except that the undulating surface **20** extends from the right to the left of the plate member **18** as viewed in FIGURE 4. The plate members **10** and **18** are each formed with an aperture or hole **22** in each end portion and with an aperture or hole **24** in the center portion. The plate members **10** and **18** are not of uniform height throughout their length due to the configuration of the undulating surfaces **16** and **18** so that the center portion of each plate member is of the greatest height with the end portions being of the smallest height.

The plate members **10** and **18** are assembled into supporting frame or rib structures by arranging a plurality of said plate members in contiguous parallel relation to one another. The plate members are arranged in odd number of rows and while FIGURE 4 shows three rows of plate members this is by way of illustration as it may be determined that the load to be supported would require an assembly of additional rows. The plate members of any one row are so arranged that the ends thereof are spaced from the ends of the plates immediately preceding as well as trailing said plate members. As shown in FIGURE 4 the two ends of one plate member are spaced from the ends of the immediately preceding and immediately trailing plate member a distance equal to one-half the length of a plate member. While all of the plate members **10** and **18** are arranged in spaced parallel relation to one another no one plate member overlies another plate member as each plate member is arranged in staggered relation with respect to its adjacent plate member. The plate members **10** and **18** are joined to one another in the aforementioned staggered and overlapping arrangement by suitable bolts **26** that are inserted through the apertures **22** and **24** and suitable nuts **28** are threaded on the bolts **26** to lock the plate members in their assembled position such as shown in FIGURES 1 and 2.

In assembling the plate members **10** and **18** so as to form a supporting frame or rib structure which may be in the form of an arch, as shown in FIGURE 1; it is to be noted that in each row the plate members **10** and **18** are alternated with respect to one another. This alternate arrangement produces undulating surfaces that extend in opposite directions in adjacent plate members in each row. However, as regards the undulating surfaces of the

various plate members in the several rows that are assembled together there is formed a recess or notch **30** that extends transversely to the longitudinal axis of the plate members **10** and **18**. The securing together of the several rows of plate members **10** and **18** to form the rib structure or supporting frame results in the undulating surface on the next adjacent plate member so as to form recesses or notches **30** which facilitate the securing or anchoring of sheet panelling **32** to the rib structure as a cover member. The edge formations **34** of adjacent sheet panelling **32** are readily secured to the plate members as shown in FIGURE 3 while at the same time grooves or ridges **36** formed in said cover members **32** are also secured or anchored in the recesses or notches **30** as illustrated in FIGURE 2. The recesses or notches **30** formed by the undulating surfaces **16** and **20** of the plate members tend to exert pressure from two directions against the edge formations **34** and grooves **36** of the cover member **32** to insure the locking and retention of the cover member upon the supporting rib structure. Such an arrangement provides for a rigid structure that is sturdy and capable of bearing a relatively heavy load. The panel members **10** and **18** may have brace members **38** secured thereto by the bolts **26** if additional strengthening is deemed necessary as illustrated in FIGURE 1 although it is to be noted that the plate members **10** and **18** when assembled in the aforementioned manner and with the cover members connected thereto produce a structure or unit that is sturdy and rigid and readily susceptible of many uses without requiring any braces.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

What is claimed is:

1. A supporting frame for a panel type covering member comprising a plurality of flat elongated plate members arranged in spaced parallel relation to one another, means, securing said plate members together in staggered relation to one another defining a frame member, said plate members having an undulating surface formed on a common edge thereof, said undulating surfaces including a plurality of spaced recesses having relatively sharp abutments, with the abutments of contiguous plate members extending in opposite directions and defining with contiguous plate members recesses extending transversely of the longitudinal axis of said plate members, and a cover member having flanged edge formations positioned within certain of said recesses for securing said cover members to said plate members.

2. A supporting frame as defined in claim **1** wherein said cover member is also formed with depending grooves for engagement by the abutments of said plate members.

3. A supporting frame as defined in claim **2** wherein said undulating surfaces comprise a plurality of saw-like teeth forming recesses having relatively sharp abutments for engaging the flanged edge formations and grooves of said cover member.

4. A supporting frame as defined in claim **1** wherein said plate members are arranged in parallel rows with the plate members of each row being spaced from one another a distance approximately one-half the length of one of said plate members.

5. A supporting frame as defined in claim **1** wherein said plate members are secured to one another in angular relation to form a frame member having an arch configuration.

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52—478, 483, 520