United States Patent

Jureit

[15] **3,696,572**

[45] **Oct. 10, 1972**

[54] **SUPPORT FOR PANELS AND THE LIKE**

[72] Inventor: **John Calvin Jureit,** Coral Gables, Fla.

[73] Assignee: **Automated Building Components, Inc.,** Miami, Fla.

[22] Filed: **Aug. 6, 1968**

[21] Appl. No.: **750,660**

[52] **U.S. Cl.** **52/173,** 52/95, 52/629, 52/735, 206/65

[51] **Int. Cl.**.....**E04b 7/02,** E04d 13/16

[58] **Field of Search**.....52/94–96, 173, 52/629, 735; 287/20.92 LP; 85/13; 206/65, 65 R, 65 K

[56] **References Cited**

UNITED STATES PATENTS

2,101,378	12/1937	Wiskoff	24/85
2,545,048	3/1951	Salmons	206/65 K
3,172,171	3/1965	Knight	287/20.92
3,298,151	1/1967	Jureit	287/20.92 LP
3,415,019	12/1968	Andersen	52/94

FOREIGN PATENTS OR APPLICATIONS

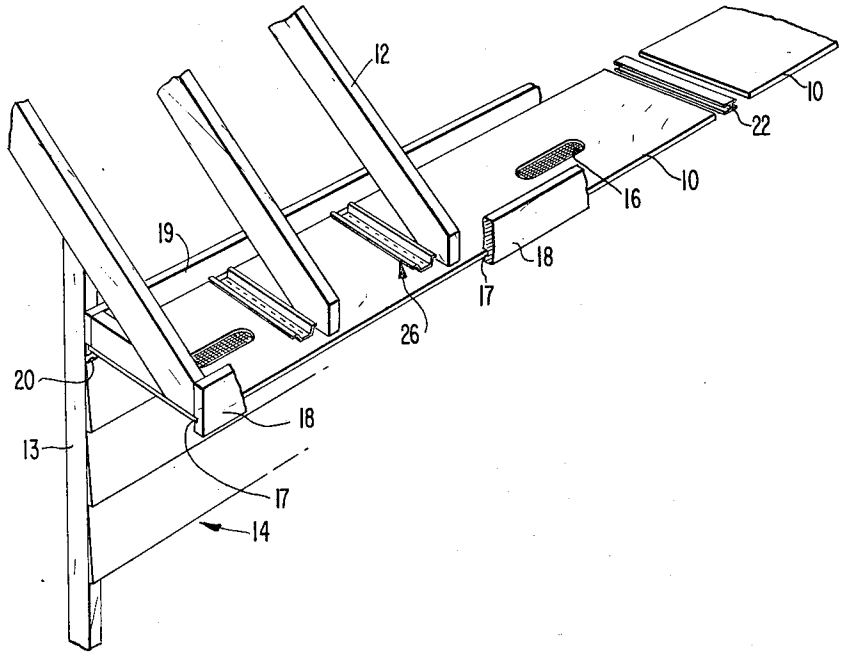
1,082,001	6/1954	France	52/629
508,992	7/1939	Great Britain	52/629

Primary Examiner—Alfred C. Perham
Attorney—LeBlanc & Shur

[57] **ABSTRACT**

The support has an elongated sheet metal plate bent about longitudinal axes to provide a pair of longitudinally extending edge portions upstanding from an intermediate portion. A pair of flanges are bent to extend outwardly from the edge portions. A plurality of teeth are struck from the intermediate body portion to extend normal thereto in a direction generally opposite to the direction in which the edge portions extend from the intermediate body portion. The teeth are embedded into the panel and the support reinforces the panel to preclude sagging, bowing and the like. The edge portions are flared outwardly such that the supports nest, one within the other, to form a packing assemblage. In one form of the packing assemblage, the teeth of each fastener extend through the slots left by the teeth struck in the intermediate portion of the support nested next below.

11 Claims, 7 Drawing Figures



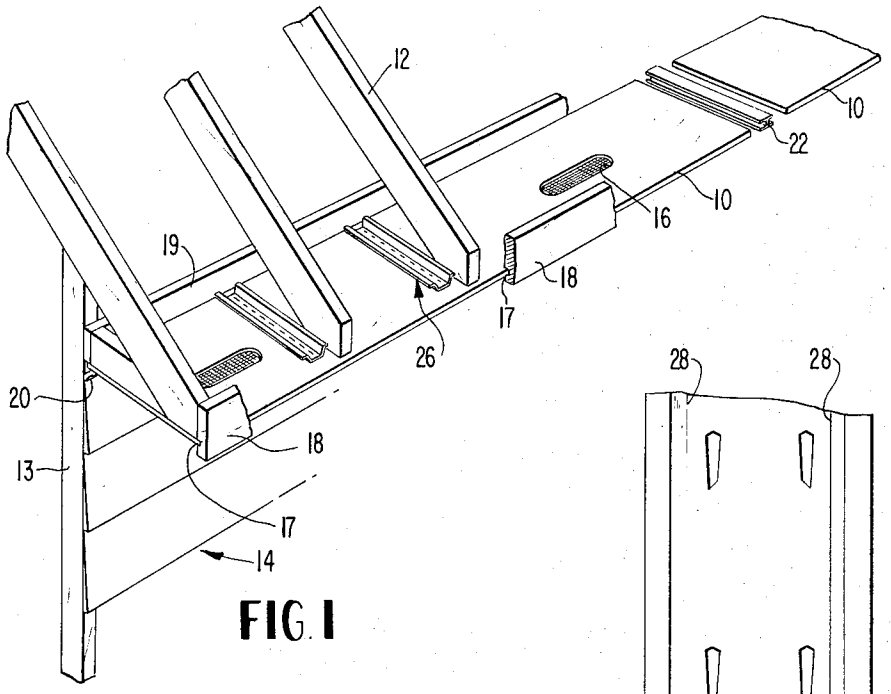


FIG. 1

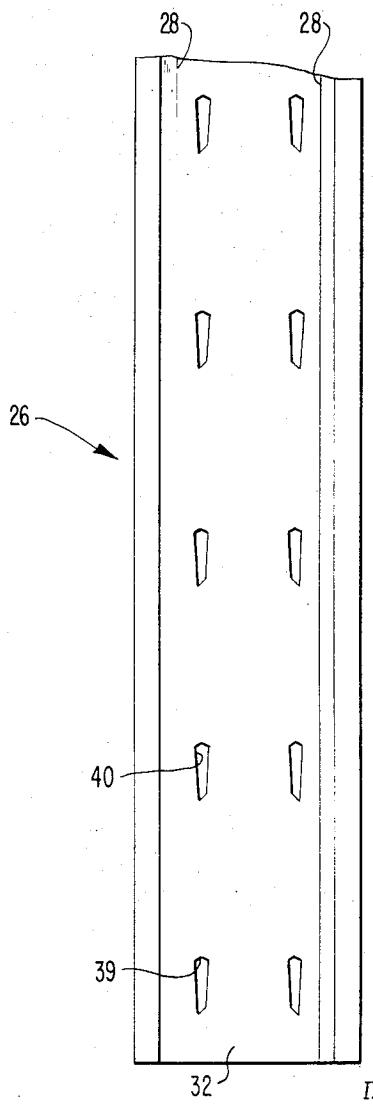


FIG. 2

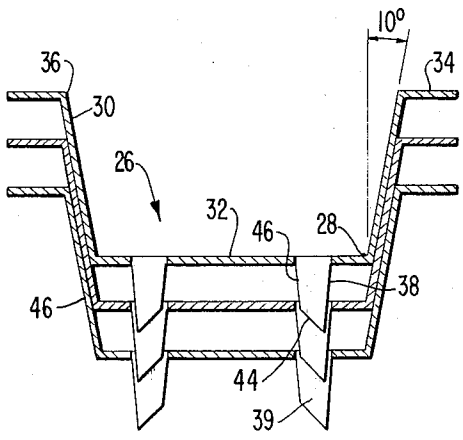


FIG. 3

INVENTOR
JOHN CALVIN JUREIT

BY LeBlanc & Shur
ATTORNEYS

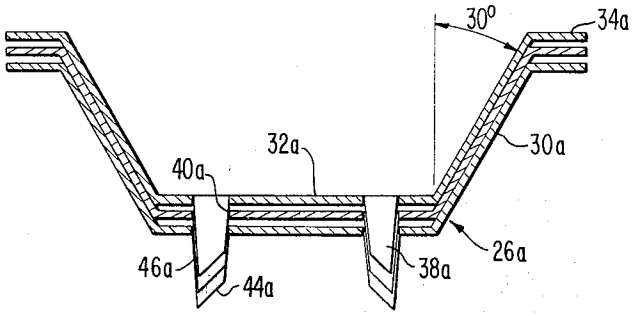
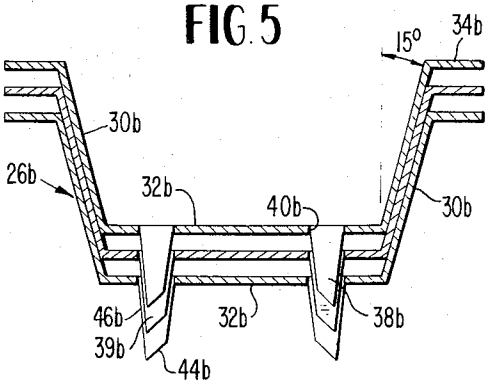


FIG. 4

FIG. 5



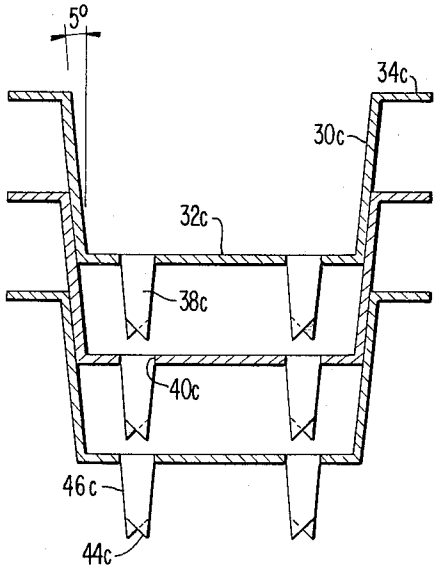


FIG. 6

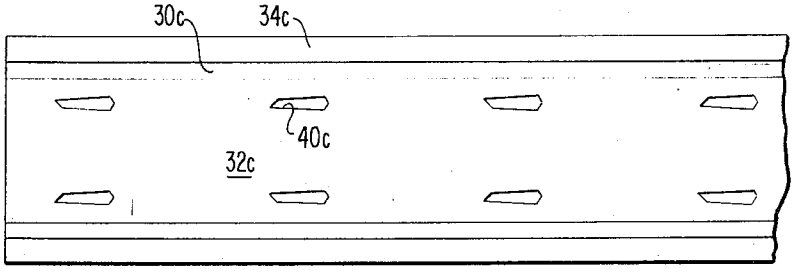


FIG. 7

INVENTOR

JOHN CALVIN JUREIT

BY LeBlanc & Shur

ATTORNEYS

SUPPORT FOR PANELS AND THE LIKE

The present invention relates to a support for reinforcing panels and the like and particularly relates to an improved support for use in reinforcing under-the-eave soffit panels and to a packing assemblage of such supports.

Conventional methods of providing soffit panels under the eaves of residential roofing have required so-called "look-out" members secured to extend horizontally between the ends of diagonal roofing members and the side frame of the house. These look-out members are usually individually cut and nailed into position at considerable cost and labor. The soffit panels would then be nailed or otherwise secured to the undersides of the look-out members, the look-out members preventing bowing, sagging, and other deformation of the soffit panels.

A known method of eliminating the use of these look-out members employs a plurality of sheet metal supports, fixed to the upper surfaces of the soffit panels by means of triangularly configured teeth struck from the supports and embedded into the soffit panel. These supports are intended to reinforce the soffit panel against bowing, sagging, etc. when the latter are secured between the ends of the diagonal roof members and the side of the house. These supports are provided in short lengths and when the soffit panel is too wide for use of a single support, the supports are combined in a substantially end-to-end relation to span the panel. This has not proved successful and some sagging still occurs. Furthermore, such sheet metal supports as have been provided heretofore have relatively low upstanding flanges which provide a magnitude of moment of inertia insufficient to provide a high resistance to bending moments and thereby such supports do not effectively prevent undesirable sagging or bowing of the soffit panel. Still further, packaging these known supports for shipment has proven to be difficult, laborious and cumbersome due to their channel configuration. The resulting packages are bulky as space saving techniques cannot be employed with supports formed to this configuration and this greatly increases the shipping costs of such supports.

According to the present invention, there is provided an improved support in the form of an elongated sheet metal plate having generally upstanding outwardly flaring sides with the base or intermediate portion therebetween having a plurality of nail-like teeth struck to extend therefrom in the opposite direction for embedment into the panel. Outwardly extending flanges project from the upper edges of the sides whereby the moments of inertia of the support members are greatly increased. This makes it possible for a given cross section of metal to provide far greater support and superior resistance to bending moments than is feasible with the above described known support members.

It is a particular feature hereof that the present support members are formed to nest, one within the other, whereby an efficient packing assemblage from a space saving standpoint is provided. To accomplish this, the sides of the present support are flared outwardly as to permit reception of one or more like and similarly oriented supports in nesting relation therewith. In one form of the packing assemblage hereof, the sides of the supports are flared outwardly such that the intermediate base portions of the supports are spaced, one from the other, whereby the tips of the teeth of overlying supports are spaced from the base portions of the underlying supports. In a further form hereof, sides of the supports are flared to a greater extent such that the supports assume a close nested relation each with the other with the teeth of the overlying supports extending through the slots left in the base portions of one or more of the underlying supports. To facilitate the nesting of the supports, lateral edges of the teeth are slightly tapered in an inward direction so That the teeth of the superposed supports do not interfere with or otherwise engage the lateral edges of the slots of the underlying supports when these latter forms of packing assemblages are employed.

To increase the resistance to withdrawal of the teeth in the panel, the ends of the laterally adjacent teeth are scarfed in opposite lateral directions whereby a clinching action is provided upon embedment of the support into the panel. In a further form, the next adjacent longitudinally spaced teeth are scarfed in opposite directions whereby such teeth also provide a clinching action.

Accordingly, it is a primary object of the present invention to provide an improved support for reinforcing panels and the like and particularly to provide an improved support for under-the-eaves soffit panels.

It is another object of the present invention to provide an improved sheet metal support for reinforcing panels and the like which is characterized by a high moment of inertia for a given cross section of metal.

It is still another object of the present invention to provide the soffit panel and reinforcing support therefor wherein sagging, bowing, and other deformations of the panel are substantially precluded.

It is a further object of the present invention to provide improved supports for reinforcing panels and the like wherein the supports are formed to nest one within the other to provide an efficient packing assemblage.

It is a still further object of the present invention to provide a packing assemblage comprising supports having the foregoing characteristics and wherein a great number of supports can be packaged in a minimum of space.

These and further objects and advantages of the present invention will become more apparent upon reference to the following specification, appended claims and drawings wherein:

FIG. 1 is a fragmentary perspective view of an under-the-eave soffit panel employing a reinforcing support constructed in accordance with the present invention;

FIG. 2 is an enlarged fragmentary plan view of the support hereof;

FIG. 3 is an enlarged cross section of a plurality of supports of the type illustrated in FIG. 2 and shown in nested relation one within the other;

FIGS. 4 through 6 are respective enlarged cross-sectional views of several forms of supports hereof and illustrating a plurality of supports in each form thereof in nested relation one within the other; and

FIG. 7 is a fragmentary plan view of the support illustrated in FIG. 6.

Referring now to the drawing, particularly to FIG. 1, there is shown a plurality of under-the-eave soffit panels indicated at 10 finally secured in end-to-end relation and extending transversely between the lower

ends of the overhanging diagonal members **12** of a roofing structure and the side frame **13** of, for example, a house, generally indicated at **14**. Panels **10** are provided with conventional screened vents **16**. The panels **10** may be secured to the members **12** by nailing through the outer edge portions thereof into the lower ends of members **12** by use of molding, not shown, or preferably by rabbeting them as at **17** to fascia panels **18** which, in turn, are nailed to the outwardly facing ends of member **12**. The inner edge portions of panels **10** may be secured to housing frame **13** by nailing to a strip **19** secured to housing frame **13** or may be supported on a molding **20** secured to housing frame **13**. Suitable spacers **22** are provided between longitudinally adjacent panels **10**. A plurality of longitudinally spaced, transversely extending supports, generally indicated at **26**, are secured along the upper faces of panels **10** and provide reinforcement to the panels whereby bowing, sagging and other deformations thereof are effectively precluded. It will be appreciated that supports **26** may be employed with other types of panels and that the under-the-eaves soffit panel system herein described and illustrated with reference to FIG. **1** is to be considered as exemplary only and not a limitation on the use of supports **26**.

Referring now to FIGS. **2** and **3**, each of supports **26** comprises an elongated strip of sheet metal, preferably **28** U.S. standard gauge, bent about longitudinally extending laterally spaced fold lines **28** to form a pair of laterally spaced upstanding sides or edge portions **30** defining a base or intermediate plate portion **32** therebetween. For reasons as will presently become clear, sides **30** are bent to incline or flare outwardly in a lateral direction from base portion **32** such that the included angle between sides **30** and base portion **32** is greater than **90** degrees. Upper edge portions **34** of sides **30** are bent about longitudinal fold lines **36** in opposite directions to form a pair of upper flanges which project laterally of support **26** and preferably in a plane parallel to the plane containing base portion **32**.

A plurality of nail-like teeth **38** are struck downwardly from base portion **32** to extend substantially normal to and from the underside of base portion **32**. Teeth **38** are struck such that the slots **40** left thereby extend from the teeth in like longitudinal directions. As illustrated in FIGS. **2** and **3**, teeth **38** are struck to form a pair of longitudinally extending, transversely spaced, rows of teeth with the teeth in each row lying laterally adjacent the corresponding teeth in the other row. The teeth **38** are preferably struck to provide a shallow V-shape cross section as at **39** whereby the teeth are reinforced along their lengthwise extending axes. As best seen in FIG. **3**, teeth **38** have scarfed ends **44** with the ends of laterally adjacent teeth being scarfed in opposite directions to provide a lateral clinching action upon embedment of such teeth into a panel. For reasons as will become clear, the lateral edges **46** of teeth **38** are tapered slightly inwardly as to converge in a direction away from the base of the teeth.

In a preferred form hereof, supports **26** are formed of 28 U.S. standard gauge galvanized sheet metal having a nominal thickness of 0.018 inch. It will, of course, be appreciated that sheet metal having other thicknesses, for example, 24 U.S. standard gauge, may also be utilized. The width of base portion **32** is preferably 1 inch and the height from the lower face of base **32** to the upper face of flanges **34** is preferably 0.6 inch. The respective sides **30** form included angles with bease portion **33** of 100°. The teeth are longitudinally spaced one from the other along support **26** on 1½ inch centers but may be spaced 2 inches apart if desired. Teeth **38** are 0.1 inch wide at their base and have a length about 0.375 inch. The included angle of the V-shaped teeth is preferably 120° and the ends of the teeth are scarfed preferably at 45° angles. The supports are provided in lengths depending on their use so that the supports span the associated panels from edge to edge to avoid a splice intermediate the panel edges.

In use, supports **26** are pressed into a panel face, for example, upper face of panel **10** shown in FIG. **1**. This can be accomplished by inserting, for example, a 1-inch wide board between the sides **30** and hammering along the outer edge of the board thereby driving nails **38** into the panel. As will be readily appreciated, the scarf pointed ends **34** of teeth **38** tend to bend the teeth **38** laterally outwardly upon embedment into the panel whereby a lateral clinching action is effected, thus assuring retention of the supports **26** on the face of the panel and providing a high resistance to withdrawal of the teeth from the panel.

By forming a relatively narrow base or intermediate portion **32** and forming the flanges **34** along the upper edges of sides **30**, a substantial moment of inertia about the neutral axis of the support is provided. This is a significant increase as compared with supports previously employed for this purpose. It will therefor be appreciated that the present support, by developing this relatively high moment of inertia, can resist substantial bending moments and thus is effective to prevent sagging, bowing, and other deformation of the panels, such as for example, the soffit panels **10** illustrated in FIG. **1**.

It is a feature of the present invention that supports **26** are particularly formed whereby the same may be located in nested relation, one with the other, as to provide a space-saving, packing assemblage. To this end, the sides **30** flare outwardly and, in the form of support illustrated in FIGS. **2** and **3**, respectively, form included angles of about **100** degrees with base portion **32**. By flaring sides **30**, supports **26** may be nested or inserted one within the other with the outer faces of the sides **30** of each support engaging the inner faces of the sides **30** of the support next below. In the packing assemblage illustrated in FIG. **3**, the sides **46** of teeth **38** taper inwardly as to be receivable within the slots **40** left by the teeth struck in the support **26** packaged next below. Thus, when lying in the nested packing assemblage with the teeth **38** of each support **26** engaging through the slots **40** of the support **26** next below, it will be seen that the teeth **38** do not interfere with the nesting arrangement forming the packing assemblage hereof. The support strips **26** can thus be packaged one within the other whereby considerable savings in space is effected. Also, with the side walls of the nested supports **26** engaging and forming a friction fit with one another and the teeth of the superposed supports extending through the underlying supports, it will be seen that a stable and orderly array of supports can be provided in the packing assemblage. Note that with a flare angle of 100°, the base portions **32** of the next adjacent nested

supports are spaced one from the other whereby the teeth of the superposed supports extend only through the slots of the supports next below.

Referring now to FIGS. 4 through 7, there are illustrated three additional forms of supports hereof, each form being similar to the form illustrated in FIGS. 2 through 3 and having like reference numerals assigned succeeded by the letter notation *a–c*, respectively to designate like parts. As seen in FIG. 4, the sides **30***a* of support **26***a* flare outwardly at a greater angle than the sides **30** of the support **26** illustrated in FIGS. 2 and 3, and, in this form, flare outwardly to form included angles of about 120° with base portion **32***a*. By providing this large flare angle, supports **26***a* can be disposed in close, nesting relation, each with the other, and, in this form, the teeth **38***a* of the superposed supports **26***a* extend through each of the slots **40***a* left by the teeth struck from the next four underlying supports **26***a*.

Another form of support is illustrated in FIG. 5 and, in this form, the sides **30***b* of supports **26***b* flare outwardly to form included angles of 105° with base portion **32***b*. The teeth **38***b* extend through the slots **40***b* of the two next lower supports **26***b* in this packing assemblage and it will be seen that the bases **32***b* of the respective supports **26***b* are spaced closer together than the corresponding spacing illustrated in the packing assemblage of FIG. 3 and are spaced further apart than the packing assemblage illustrated in FIG. 4.

In the form of support illustrated in FIGS. 6 and 7, the sides **30***c* of supports **26***c* flare outwardly to form included angles with base portion **32***c* of 95°. It will be seen that in this packing assemblage, tips of the teeth **38***c* are spaced from the base portions **32***c* of the next underlying support **26***c* when supports **26***c* lie in nested relation one to the other. In this form, the side edges of the teeth **38***c* need not be tapered inwardly and may lie in parallel relation, one with the other, although such sides are preferably slightly inwardly tapered toward one another to provide for easier insertion. The ends **44***c* of teeth **58***c* of each laterally spaced pair of teeth are, as before, scarfed in opposite lateral directions. However, the ends of teeth **38***c* comprising longitudinally adjacent pairs of teeth are scarfed in opposite directions as seen in FIG. 6 and as indicated by the oppositely scarfed ends of the slots **40***c* left by the struck teeth (FIG. 7); alternating laterally inward and outward clinching actions are provided along the length of the support upon embedment into the panel member.

It will be appreciated that the nested supports **26***a* are offset longitudinally one from the other, in the forms of supports hereof illustrated in FIGS. 2 through 5, at least a distance equal to the thickness of the metal sheet from which the supports are formed. The supports in the form hereof illustrated in FIGS. 6 through 7, may be nested, one within the other, without regard to the relative locations of the teeth of the next adjacent supports as their teeth need not register through the slots of the next adjacent supports whereas the supports comprising the packing assemblages illustrated in FIGS. 2 through 5 must be aligned such that the teeth thereof engage through the slots of the next adjacent supports. The latter type supports are accordingly prevented from substantial longitudinal movement when in the packing assemblage due to the engagement of the teeth through the slots of the underlying support(s) and thus provide a stable, substantially non-slipping packing assemblage.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A support for a panel member comprising an elongated sheet metal plate having an intermediate portion and a pair of edge portions bent about laterally spaced longitudinally extending axes to extend from said intermediate portion on one side thereof, a pair of flanges bent about longitudinally extending axes to extend from said edge portions in opposite lateral directions and in a direction generally parallel to said intermediate portion, and a plurality of nail-like teeth struck from said intermediate plate portion about transverse axes and at longitudinally spaced positions along said support, said teeth being struck to extend substantially normal to and from the opposite side of said intermediate portion and being adapted for embedment into the panel member with said intermediate portion overlying the panel to reinforce the same.

2. A support according to claim 1 wherein said edge portions are bent to incline laterally outwardly to form with an intermediate portion respective included angles greater than right angles.

3. A support according to claim 1 wherein said teeth are struck to form a pair of laterally spaced, longitudinally extending rows thereof, said teeth having scarfed ends.

4. A support according to claim 2 wherein said teeth are struck to form a pair of laterally spaced, longitudinally extending rows thereof, the teeth in each row having scarfed ends, the ends of the teeth of one row being scarfed in a direction opposite to the direction in which the ends of the teeth of the other row are scarfed to provide a lateral clinching action.

5. A support according to claim 2 wherein said teeth are struck to form a pair of laterally spaced longitudinally extending rows thereof, the longitudinally next adjacent teeth in each row having their ends scarfed in opposite directions to provide a lateral clinching action.

6. A support member packing assemblage comprised of a plurality of support members, each of said support members including an elongated sheet metal plate having an intermediate portion and a pair of edge portions bent about laterally spaced longitudinally extending axes to extend from said intermediate portion on one side thereof, each of said edge portions being laterally outwardly inclined to form an included angle with said intermediate portion greater than a right angle, and a plurality of nail-like teeth struck from said intermediate portion at longitudinally spaced positions therealong leaving a plurality of slots in said plate extending longitudinally of said plate from said teeth, said members being nested one within the other such that inner face portions of said edge portions associated with the un-

derlying member engage outer face portions of said edge portions associated with the overlying nested member.

7. A packing assemblage according to claim 6 wherein the teeth associated with the overlying member extend through the slots associated with the underlying member.

8. A packing assemblage according to claim 7 wherein the opposite sides of said teeth are tapered inwardly toward one another.

9. A packing assemblage according to claim 6 wherein each of said support members include a pair of flanges bent about longitudinally extending axes to extend from said edge portions in opposite lateral directions and in a direction generally parallel to said intermediate portion.

10. A reinforced panel assemblage comprising a panel member, an elongated sheet metal plate having an intermediate portion and a pair of edge portions bent about laterally spaced longitudinally extending axes to extend from said intermediate portion on one side thereof, a pair of flanges bent to extend from said edge portion in opposite lateral directions about longitudinally extending axes and in a direction generally parallel to said intermediate portion, and a plurality of nail-like teeth struck from said intermediate plate portion about transverse axes and at longitudinally spaced positions therealong, said teeth being struck to extend substantially normal to and from the opposite side of said intermediate portion for embedment into a face of said panel member, said support plate overlying the panel face to reinforce the panel.

11. A support assemblage according to claim 10 including a plurality of said plates extending in parallel spaced relation along said panel member face.

* * * * *