

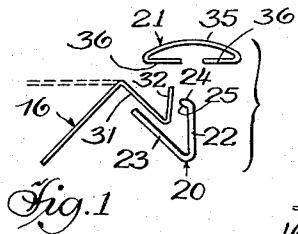
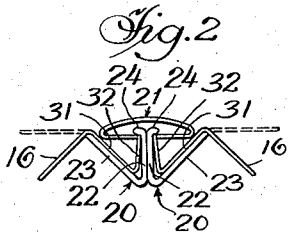
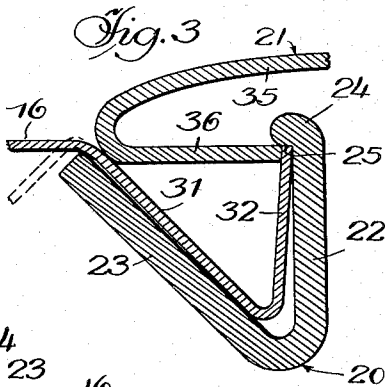
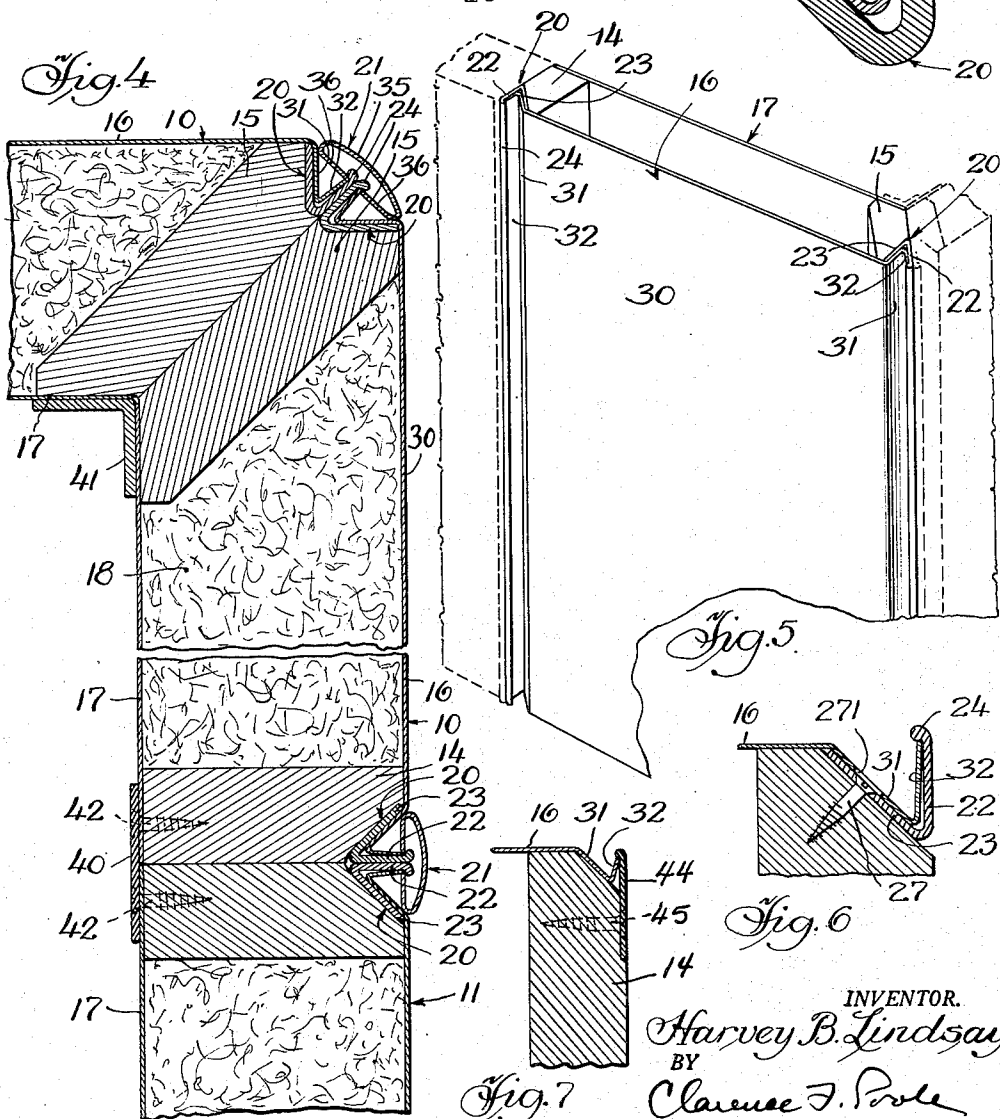
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H. B. LINDSAY

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PREFABRICATED STRUCTURE FOR CONTAINERS AND THE LIKE

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INVENTOR.

Harvey B. Lindsay
BY

BY

Clarence F. Poole

Atty

UNITED STATES PATENT OFFICE

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PREFABRICATED STRUCTURE FOR
CONTAINERS AND THE LIKEHarvey B. Lindsay, Evanston, Ill., assignor to
Lindsay & Lindsay, Chicago, Ill., a partnership

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This invention relates to improvements in prefabricated structures adapted to be shipped in knocked down form, and adapted for housings, partitions, containers, boxes, furniture, and similar structures.

More particularly the invention constitutes an improvement involving certain features of my invention disclosed in application Serial No. 489,888, filed June 7, 1943, wherein the principal structural elements consist of metallic frame members and panel sheets adapted for interlocking connection with each other.

One of the main objects of the present invention is to provide an improved interlocking structural element adapted for use as a separate structure or as a part of individual composite panel elements made of different materials such as metal, wood, or the like, and perhaps lined with suitable insulating material, but utilizing the general principles of interlocking connection devices disclosed in my prior application, including metal locking members along the marginal edges thereof.

A further object of the invention is to provide a composite panel structure of the character above described, wherein the metallic locking members or flanges along the margins thereof are arranged so as to be protected from damage during shipment or handling of the panels prior to assembly.

A further object is to provide a method of disassembly of the panels substantially as quick and easy as that of assembly, by means of a snap molding member which is adapted to cooperate with the locking flanges to provide a simple and efficient means for locking and unlocking the flange connections when desired.

The invention may best be understood by reference to the accompanying drawing, in which—

Figure 1 is a transverse section showing in disassembled relation a set of structural elements which form the basic locking members of the present invention;

Figure 2 is a transverse section showing two sets of locking members similar to those shown in Figure 1, but in mutually assembled relation;

Figure 3 is an enlarged detail section showing the parts illustrated in Figure 1 in assembled relation;

Figure 4 is a fragmentary transverse section showing a preferred application of the locking members of the present invention, wherein a building structure is made up of a plurality of composite panels equipped along their marginal

edges with locking members of the kind shown in Figures 2 and 3;

Figure 5 is a perspective view in part section of a single composite panel of the kind shown in Figure 4;

Figure 6 is a detail section showing a modified form of locking member and flange; and

Figure 7 is a fragmentary detail section of a composite building panel showing a modified form of locking member made partially of the wood frame or filler of said panel.

Referring now to details of the embodiment of my invention illustrated in the drawing, a typical building structure to which it is applied is shown in Figure 4, wherein fragmentary, broken-away portions of two panels 10, 10 are joined together at one corner of a building structure, with a portion of an intermediate or side panel 11 connected to one of them.

In the form shown, the body of each panel 10 includes a wooden frame member 14 along its squared side edge, and a wooden frame member 15 at a 45° angle along its diagonal or mitered corner edge. Said frame members are connected by an outer metal panel sheet 16 and an inner metal panel sheet 17, to enclose suitable insulating material 18. The structure of the panel body may vary widely as to the kind and arrangement of material employed, the structure shown and described herein being merely to illustrate the use and application of the exterior panel sheets 16, their interlocking connection with the marginal locking pieces 20, and the snap lock molding strips 21, which form the principal features of the present invention.

The parts which provide the interlocking connection between the exterior panel sheets 16, locking pieces 20, and the molding strips 21, are shown in detail in Figures 1, 2 and 3. The locking pieces 20 are each preferably made of strips of relatively stiff or rigid material, such as sheet metal, which is bent or formed longitudinally upon itself to produce an elongated, substantially V-shaped groove between two acute-angled webs 22 and 23 arranged at approximately 45° to each other. One web 22 is preferably slightly shorter than the other and is provided with an inturned beading 24 along its free outer edge so as to form an overhanging locking shoulder 25, as clearly shown in Figure 3. This usually shorter web, with its locking shoulder, is designed to be set with its outer surface flush with the outer edge face of the panel to which it is attached, while the opposite web 23 is arranged with its outer edge substantially flush with the outer face of the panel

and at an intermediate angle thereto. Thus, in the form of panel indicated at 10 in Figure 4, the locking piece 20 along the mitered corner of said panel is set into the wood frame member 15 with its shouldered web 22 flush with the diagonal end face of said frame member, and with its other web 23 having its outer edge flush with the outer face of said corner frame member and at a 90° angle thereto.

The other locking piece 20 along the squared frame member 14 is arranged with its shouldered web 22 flush with the end face of said frame member, and with its other web 23 having its outer edge flush with the outer face of said frame member, and at an angle of 45° thereto. The locking web 22 is preferably made relatively short as shown, so that the beading 24 which forms the locking shoulder 25 does not project substantially beyond the outer face of the panel when the locking piece is used on a squared edge, as shown in the lower part of Figure 4.

The locking pieces 20, 20 may be secured to the panel in any suitable manner. When wood frame members are employed as shown, said pieces may be secured to the latter by screws 27 passing through the webs 23. If for some reason it be desired to remove the sheet 16 with locking members 20 still attached thereto, registering holes 271 may be previously punched in the sheet flange 31, through which screws 27 may be withdrawn and sheet 16 then removed with members 20 still locked around its edges, as shown in Figure 6.

Each of the metal panel sheets 16 may be substantially similar to the panel sheets disclosed in my prior application Serial No. 489,888 previously referred to, and consists of a flat body 30 of sheet metal, which is surrounded by an inner flange 31, and an outer flange 32 arranged at a reverse acute angle to flange 31. The inner flange 31 is disposed at a considerable angle to the body 30—usually at approximately 90° or more; and the flanges 31 and 32 are normally disposed at an angle of slightly more than 45° to each other. The two flanges 31 and 32 are preferably formed by press drawing the margins of the sheet metal panel in the usual manner.

The panel sheets 16 are interlocked with the marginal locking pieces 20 by inserting the two flanges 31, 32 in wedge-fitting engagement in the V-shaped groove formed between the webs 22 and 23 of said locking pieces, as shown in detail in Figures 2 and 3. The outer flange 32 is substantially flat, and is of such length that its free outer edge engages snugly beneath the overhanging shoulder 25 of web 22, and is normally held in such position by slight compression between said flanges, due to the fact that the webs 22 and 23 have a slightly less normal angle of divergence (45°) than that of the flanges 31 and 32, as previously described. Thus when said flanges are inserted in a V-shaped groove under moderate pressure, the free edge of flange 32 will push or even spring into place immediately and will become locked therein under tension beneath the shoulder 25, as shown in Figures 3 and 4.

It should be noted that under stresses tending to drag the sheet flanges 31 and 32 of the grooved locking piece 20, it is important that the flanges (particularly flange 32) and groove walls (particularly web 22) be substantially flat. When an outward tension is exerted on the flange 31, a compressing or wedging action is exerted on the flange 31, a compressing or wedging action is exerted on the flange 32 between the inner face of web 23 near its bottom, and the shoulder 25. Since the

flange 32 is in the same plane as the compressive action thereon, said flange will stand enormous stresses without bending or collapsing. Moreover, tension on the panel sheets 16 may be directed at a wide variety of angles relative to the locking piece, as indicated, for instance, in dotted lines in Figures 1, 2 and 3, without materially affecting the locking action.

The panel sheets 16 and locking pieces 20 above described are especially adapted to be assembled on building panels 10 or 11 to form the exterior faces thereof, as shown in Figure 4, while the locking pieces also provide means for interlocking connection between adjacent panels in conjunction with the molding strips 21, as will now be described.

As will now be described, the molding strips 21 each consists of a length of spring sheet metal, bent longitudinally upon itself so that it resembles in cross-section a vertically elongated letter C, with an outwardly bowed center section 35, and with opposed, inwardly extending free ends 36, 36, preferably flattened so as to lie in the same plane, as clearly shown in Figures 1, 2 and 4.

Each molding strip is formed so that its bowed portion 35 extends substantially twice the distance from the outer face of web 22 to the inner extremity of web 23 of a locking piece 20. Also, the opposed ends of its flattened portions 36, 36 are normally spaced from each other a distance closely approximating twice the combined thickness of web 22 and flange 32, but less than twice the thickness of bead 24. With these proportions, the molding strip can be snapped or clamped under tension over the meeting ends of a pair of webs 22, 22 when the edges of adjacent panels are in juxtaposed position, so as to hold said panels together, as shown in Figures 3 and 4.

It will be understood that before applying this molding strip (of the type known in the sheet metal trade as a "snap-on molding") the sheet and its flanges 32 have already been placed in locked position as described. Consequently after the snap-on molding 21 has been applied and the edges 36, 36 thereof have snapped over the bead 24, 24, said edges come to rest (under tension in the bow part of 21) abutting against edges of sheet flanges 32, as shown in detail in Figure 3. Such abutment under pressure tends to add to the security of the retention of sheet flange 32 under the bead 24 under all conditions and stresses.

It will be observed further from Figure 4, that the molding strips 21 can be applied with equal facility either along an exterior corner joint, or an intermediate squared joint, as desired. In either instance, said molding strip serves to secure adjacent panels together along their abutting outer faces; assists in locking both panel flanges 32 and 33 in their groove, and finally acts as a filler piece to conceal the locking joint and provide the desired continuity of appearance of the outer surface of the structure, as may be seen in Figure 4.

The inner faces of the panels 10, 11 may be finished and connected together in any suitable manner. In the form shown herein, the inner sheet metal panels 17, 17 have their margins lapping over the marginal frame members 14 and 15, and the adjacent panels are connected along their inner faces by batten strips 40, 41 fastened as by screws 42 to the frame members 14 and 15.

It will be further understood that the construction wherein the molding strips are interlocked with the panel sheets and locking pieces, as above described, may be used independently of other panel structures, such as the body portions of the

panels 10 and 11, in order to provide a particularly light metallic structure consisting only of the panel sheets, locking pieces, and molding strips.

Such a type of structure would be very similar to that disclosed in my prior application Serial No. 489,888 previously described, excepting that the twin-grooved locking pieces of the previous structure would in effect be cut in half, and connected together in the final structure by the molding strip. The construction of the present invention, wherein separate locking pieces are employed, affords considerably more latitude in combining the flange locking feature with other structural forms when desired.

A modified form of locking piece is illustrated in Figure 7, wherein said locking piece consists of a flat plate 44 secured along the margin of a frame member made of wood or other material, as by screws 45 and projecting beyond a beveled surface 46 formed on said frame member at an angle of substantially 45° to the plate 44. The arrangement is such that the projecting portion of the plate 44 and the beveled surface 46 of the frame member together form a groove which is of substantially the same shape as that formed by webs 22 and 23 of the metal locking piece 20 shown in the preceding figures. This modified form of locking piece can be used as a substitute for the locking piece 20, when desired.

Although I have shown and described certain embodiments of my invention, it will be understood that I do not wish to be limited to the exact construction shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In a prefabricated structure, a pair of separable locking pieces, each having a longitudinal groove formed therealong of generally acute angular cross-section, and with one wall having an inwardly facing, overhanging shoulder along its outer edge for engaging the free outer edge of two acute angled marginal flanges of a panel sheet when said flanges are inserted in wedge-fitting engagement in said groove, said grooved locking pieces being disposable with the outer faces of their shouldered walls in mutual supporting engagement, and clamping means for spanning the outer edges of said walls and engaging beneath said shoulders for securing said pair of locking pieces together.

2. In a prefabricated structure, a pair of separable locking pieces, each having a longitudinal groove formed therealong of generally acute angular cross-section, and with one wall having an inwardly facing, overhanging shoulder along its outer edge for engaging the free outer edge of two acute angled marginal flanges of a panel sheet when said flanges are inserted in wedge-fitting engagement in said groove, said grooved locking pieces being disposable with the outer faces of their shouldered walls in mutual supporting engagement, and an arched molding strip spanning the outer edges of said walls and having inwardly facing terminal edges for engagement beneath the shoulders thereof for detachably securing said pair of locking pieces together.

3. In a prefabricated structure, a pair of separable locking pieces, each having a longitudinal groove formed therealong of generally acute angular cross-section, and with one wall having an inwardly facing, overhanging shoulder along its

outer edge for engaging the free outer edge of two acute angled marginal flanges of a panel sheet when said flanges are inserted in wedge-fitting engagement in said groove, said grooved locking pieces being disposable with the outer faces of their shouldered walls in mutual supporting engagement, and an arched spring metal molding strip for spanning the outer edges of said walls and having inwardly facing terminal edges for engagement beneath the shoulders thereof for detachably securing said pair of locking pieces together under spring tension.

4. In a composite structure, a pair of separable locking pieces, and panel sheets detachably securable thereto, each of said locking pieces having a groove formed therealong of generally acute angled cross-section and with one wall having an inwardly facing locking shoulder overhanging the outer edge of said groove, said panel sheets each having two flat oppositely bent flanges formed along its margin at an acute angle to each other for wedge-fitting engagement in the groove in one of said locking pieces, with the free edge of the outermost flange engaged beneath the locking shoulder thereof, said locking pieces being disposable with their shouldered walls in mutual supporting engagement, and clamping means for spanning the outer edges of said shouldered walls in engagement with the free edges of the outermost panel flanges beneath said shoulders for securing said pairs of locking members and their respective panel sheets together.

5. In a composite structure, a pair of separable locking pieces, and panel sheets detachably securable thereto, each of said locking pieces having a groove formed therealong of generally acute angled cross-section and with one wall having an inwardly facing locking shoulder overhanging the outer edge of said groove, said panel sheets each having two flat oppositely bent flanges formed along its margin at an acute angle to each other for wedge-fitting engagement in the groove in one of said locking pieces, with the free edge of the outermost flange engaged beneath the locking shoulder thereof, said locking pieces being disposable with their shouldered walls in mutual supporting engagement, and an arched clamping strip having its extreme outer edges extended to engage the outer faces of the inner flanges of said panel sheets to hold the latter in their respective grooves, said clamping strip also having inwardly facing terminal edges for engagement with the free edges of the outermost panel flanges beneath said locking shoulders for securing said pair of locking pieces and their respective panel sheets together.

6. In a composite structure, a pair of separable locking pieces, and panel sheets detachably securable thereto, each of said locking pieces having a groove formed therealong of generally acute angled cross-section and with one wall having an inwardly facing locking shoulder overhanging the outer edge of said groove, said panel sheets each having two flat oppositely bent flanges formed along its margin at an acute angle to each other for wedge-fitting engagement in the groove of said locking pieces, with the free edge of the outermost flange engaged beneath the locking shoulder thereof, said locking pieces being disposable with their shouldered walls in mutual supporting engagement, and an arched spring metal clamping strip substantially C-shaped in cross-section having its extreme outer edges extended to engage the outer faces of the inner flanges of said panel sheets closely adjacent the margins

of their respective panel sheets to hold said inner flanges in said groove and to substantially enclose both of said grooves and the shouldered wall portions therebetween, said clamping strip also having inwardly facing terminal edges for engagement with the free edges of the outermost panel flanges beneath said locking shoulders for securing said pair of locking pieces and their respective panel sheets together.

7. A building panel for prefabricated structures, including a body portion and exterior covering therefor, consisting of locking pieces, each formed of a sheet-metal strip having two webs bent at an acute angle to each other, said locking pieces being disposed along the exterior margins of said building panel with one web flush with the adjacent outer edge of said panel to form an exteriorly facing V-shaped groove, a panel sheet for covering the exterior face of said panel having flanged margins for interlocking engagement in said grooves, and said grooves also pro-

viding abutment surfaces for detachably connecting adjacent panels together along the projecting outer abutting web portions of adjacent locking pieces.

8. A building panel for prefabricated structures, including a body portion and exterior covering therefor, consisting of locking pieces, each formed of a sheet-metal strip having two webs bent at an acute angle to each other, and with one of said webs having an inwardly overhanging shoulder along its outer edge, said locking pieces being disposed along the exterior margins of said building panel with the shouldered web flush with the adjacent outer edge of said panel to form an exteriorly facing V-shaped groove, and a panel sheet for covering the exterior face of said panel having flanged margins for interlocking engagement in said grooves, with the free edges of said flanged margins in abutting engagement with the overhanging shoulders of the latter.

HARVEY B. LINDSAY.