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BOAT HULL CONSTRUCTED OF PANELS

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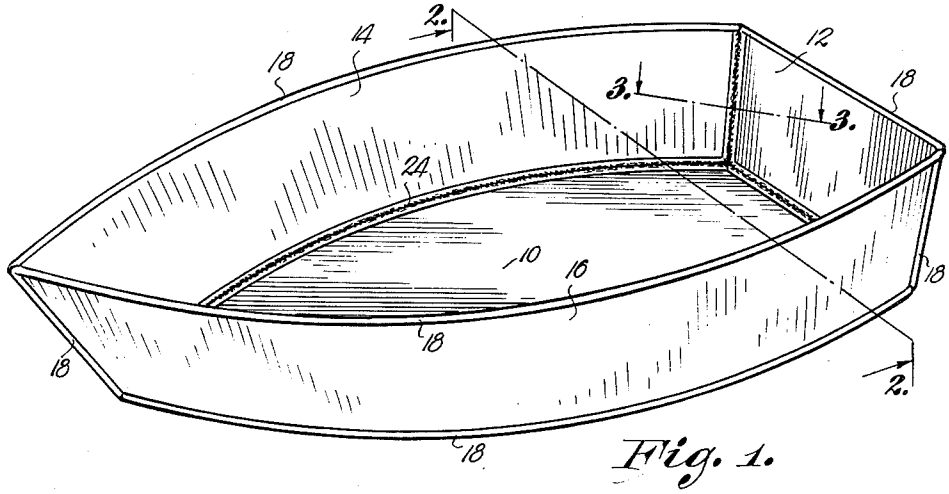


Fig. 1.

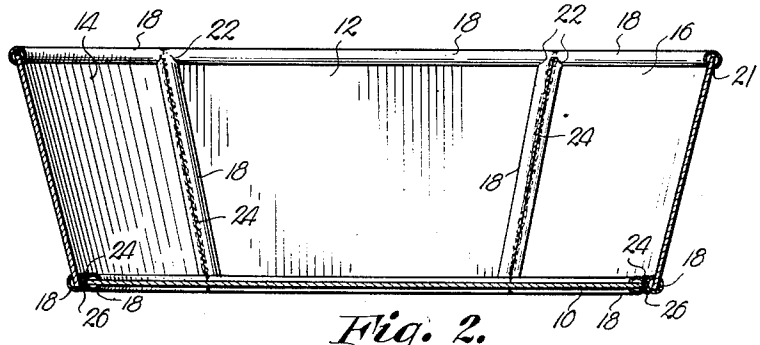


Fig. 2.

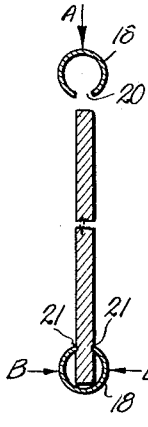


Fig. 4.

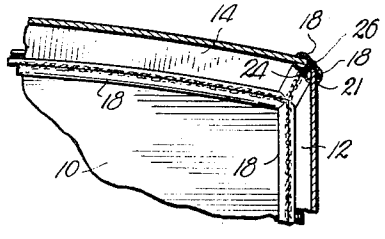


Fig. 3.

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BOAT HULL CONSTRUCTED OF PANELS

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4 Claims. (Cl. 9—6)

The present invention relates in general to the assembly of prefabricated panels into rigid multipanel structures, and it deals more particularly with the prefabrication of a novel type of panel for use in such structures.

Broadly speaking, an object of the invention is to provide a method and apparatus for simply and economically constructing lightweight but very sturdy panel structures which may be simple or relatively complex in shape, and which may employ panels that are either flat or curved and, in either case, of any desired outline.

Another object is to provide a structure composed of lightweight panels of plywood or the like, permanently secured together without nails, screws or glue, the junction between adjoining panels comprising a rigid framework reinforcing the finished structure as well as the individual panels, and the joints between the panels being thoroughly weathertight and/or watertight.

A further object resides in the provision of a novel method and apparatus for bending flat plywood or similar nonmetallic flat sheet material into curved panels capable of retaining their curvature.

Still another object is to provide a structural panel having a metal frame outlining the panel and forming the margin thereof; the portion of the panel within the frame being of plywood or other suitable nonmetallic sheet material. An important collateral object is to provide a way of so bonding the frame to the nonmetallic central portion of the panel as to form a weathertight and/or watertight union therebetween.

While having many applications, my invention is especially well suited to the construction of boat hulls, and a particular object is to provide a lightweight, inexpensive skiff or boat made of plywood or similar panels, at least some of which are curved, and all of which are joined together without screws, nails or glue to form a rigid, sturdy and watertight unit. According to the invention, the panel frames are of such strength as to eliminate the need for supplementary reinforcement of any kind, and they are so joined together as to make caulking unnecessary.

Other objects of the invention, together with the features of novelty whereby the objects are achieved, will appear in the course of the following description.

In the accompanying drawings which form a part of the specification and are to be read in conjunction therewith, and in which like reference numerals are used to indicate like parts of the various views:

Fig. 1 is a perspective view of a boat constructed in accordance with the method of and embodying the constructural features of the present invention.

Fig. 2 is a cross-sectional view taken along the line 2—2 of Fig. 1 in the direction of the arrows.

Fig. 3 is a fragmentary sectional view taken along the line 3—3 of Fig. 1 in the direction of the arrows.

Fig. 4 is an enlarged sectional view taken through one of my prefabricated panels showing the structure of the frame member and the manner in which it is affixed to the edge of the panel.

Referring more particularly to the drawings, the boat hull shown in Fig. 1 comprises an essentially flat bottom panel **10**, a flat stern panel **12**, and a pair of curved side panels **14** and **16**. Each panel is cut in one piece from flat sheet stock which, as previously indicated, may be bonded plywood or other suitable nonmetallic sheet material. The panels may be cut to the desired outline contour by sawing them from the sheet stock or, if identical

boats are to be made in considerable quantity, by a machine stamping operation.

After being cut to the desired contour, each panel is enclosed in a peripheral frame made of metallic pipe or tubing. In fabricating the frame, the pipe conveniently is cut into sections **18**, each slightly longer than the side of the panel to which it is to be applied. All of the various pipe sections then are slit longitudinally to form channels that are generally C-shaped in transverse cross section (see Fig. 4). The width of slot **20** is made equal to, or very slightly greater than, the thickness of the panel proper, so that the edge of the latter can enter the slot and seat against the opposite inside wall of the channel when same is advanced over the edge in the direction indicated by arrow A. In the case of panels whose edges are curved (see, for example, the lateral edges of the bottom panel **10** of my boat), the channel is of course bent to conform with the curvature, either before or during the application of the channel to the edge in question.

When each edge of the panel has been inserted into the slot **20** of its corresponding channel and is seated against the opposite inside wall of the channel as aforesaid, the mouth of the channel is squeezed tightly closed upon the panel by applying a clamping force on the lateral sides of the channel (see arrows B). This may be carried out in a power press or by placing one side of the channel against an anvil and striking the opposite side at closely spaced intervals with a hammer or mallet; or it may be accomplished in any other suitable fashion. This locks the channel very securely to the edge of the panel and makes a watertight joint at the points **21**. At the corners of the panel, the meeting ends of adjoining channels are cut diagonally to form a mitered joint **22**, and these ends are preferably welded or brazed together, not only to preserve the continuity of the fluid seal, but also to unite the various channel sections into a unitary frame of great strength, completely circumscribing the panel.

The metallic-bound panels as thus prefabricated may easily and quickly be assembled into the finished structure simply by arranging the various panels edge to edge in their correct relationship and laying weld seams **24** and **26** along the meeting edges of adjoining panels. The frames of the separate panels thus are united to form a single rigid frame reinforcing the finished structure and giving it great strength. Moreover, the weld seam between adjoining panels quite obviously forms a permanently watertight joint that completely eliminates the need for caulking, either at the time of initial construction of the boat or at any time thereafter.

Heretofore, in the construction of boat hulls using large plywood panels for the sides or other portions of the hull which are curved, it has been necessary to employ specially designed temporary braces and forms, often of elaborate character, to shape the panels to the proper curvature and hold them in position while fabrication of the hull is being completed. My method and arrangement make such temporary braces and forms completely unnecessary and eliminate the time, labor and expense of installing and removing them after they have served their purpose.

Such is the case because, despite the tendency of plywood and similar nonmetallic sheet material to remain flat and resist bending, my panels when bound in a peripheral metallic frame of the character disclosed can be bent to the desired curvature and will remain so bent under the influence of the metallic frame that is an integral part thereof. According to my invention, therefore, the side panels **14** and **16** of my boat are bent to the shape shown before being assembled into the final unit or, alternatively, may be so bent in the course of the assembly and welding operation.

Thus it will be seen that I obtain a boat hull which is light in weight but very sturdy and rigid. It is composed of relatively few structural components, these capable of being assembled quickly, easily and economically; and it is permanently watertight and free from the usual problems of caulking. Except for the channels forming the framework in the finished hull, it is entirely nonmetallic but contains no nails or screws that can work loose nor any glue susceptible to deterioration over a period of time.

Very obviously my method and novel structural panels have wide application beyond the field of boat building inasmuch as the panels may be made in the size and shape required for any specific installation and may be either flat or curved as necessary. The panels are exceptionally strong despite their light weight and they are very easily handled, all raw edges of the nonmetallic central section being covered and concealed by the metallic frame which forms a smoothly rounded bead about the periphery of the panel.

From the foregoing, it will be seen that this invention is one well adapted to attain all of the ends and objects hereinbefore set forth, together with other advantages which are obvious and which are inherent to the invention.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the appended claims.

Inasmuch as many possible embodiments of the invention may be made without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

1. In a boat hull, separate bottom, stern and side panels of complementary shape and contour, each of said panels formed of nonmetallic sheet material, a separate frame binding each panel, each frame comprising a metal strip encasing the edges and adjacent marginal portions of opposite faces of the panel with the opposite edges of the strip pressed into the faces of the panel to secure same thereto, said framed panels disposed edge to edge with the frame of each panel in engagement with the frames of a plurality of the remaining panels, and means securing the edge of each panel to the edge of the adjoining panels, said means comprising a continuous metal bond between the frames of adjoining panels extending the full elngth of the meeting edges thereof.

2. A boat hull as in claim 1 wherein said metal bond comprises a weld seam between frames of adjoining panels along the meeting edges thereof.

3. A boat hull as in claim 1 wherein said panels are plywood.

4. In a boat hull, separate bottom, stern and side panels of complementary shape and contour, each of said panels formed of nonmetallic sheet material, a separate frame binding each panel, each frame comprising a tubular member slit longitudinally to form a channel C-shaped in transverse cross section with the marginal portion of the panel extending through said slit into the channel and the opposite sides of said slit being tensioned toward one another to grip the faces of the panel and secure the channel in water-tight relation thereto, said framed panels disposed edge to edge with the frame of each panel in engagement with the frames of a plurality of the remaining panels, and means securing the edge of each panel to the edge of the adjoining panels, said means comprising a continuous metal bond between the frames of adjoining panels extending the full length of the meeting edges thereof.

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