

[54] **BOX SHAPED FURNITURE UNIT**  
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 [22] Filed: **Aug. 2, 1972**  
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[30] **Foreign Application Priority Data**  
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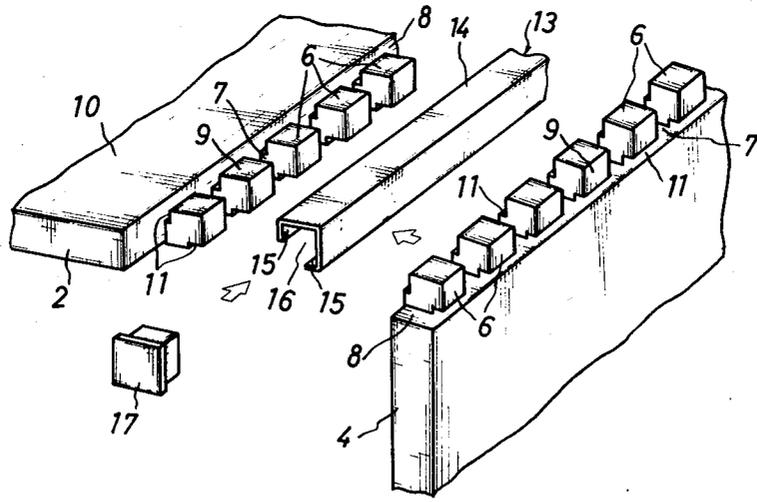
[52] **U.S. Cl.**..... **312/107**, 312/111, 312/140,  
 312/257 R  
 [51] **Int. Cl.**..... **A47b 87/00**, A47b 87/02  
 [58] **Field of Search**..... 312/108, 111, 257 R, 263,  
 312/107, 140, 257 SK

[57] **ABSTRACT**

A box-shaped furniture unit having an open front, a top board, right and left side boards, a bottom board, and a back board, all of which are interengaged with each other, the unit being able to be connected to a plurality of other furniture units so as to form various vertical and horizontal arrays.

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**6 Claims, 18 Drawing Figures**



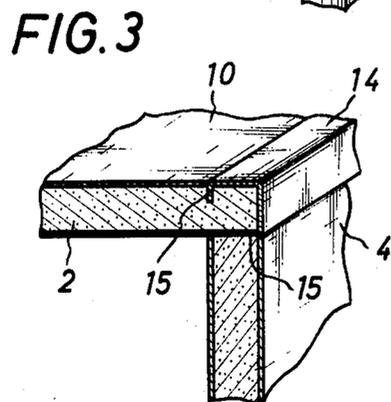
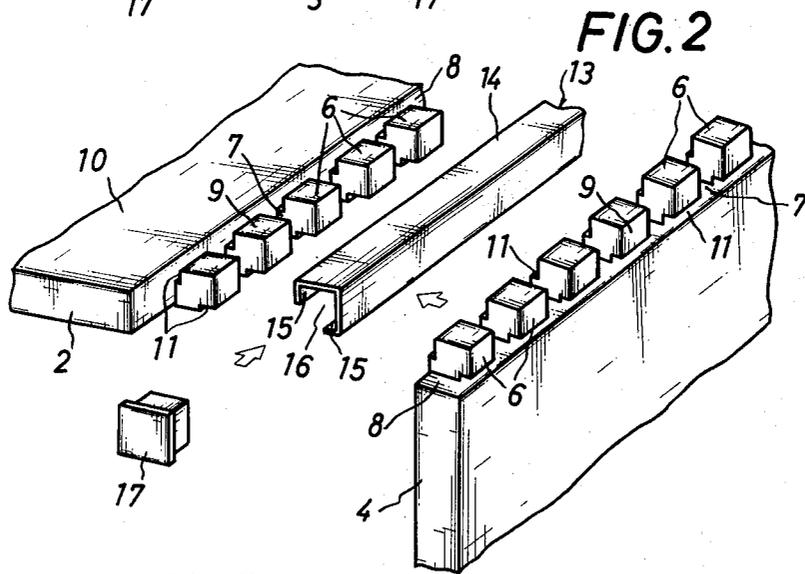
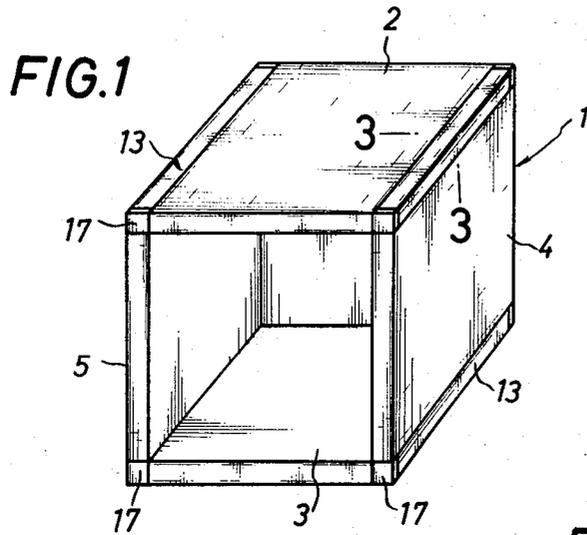


FIG. 4

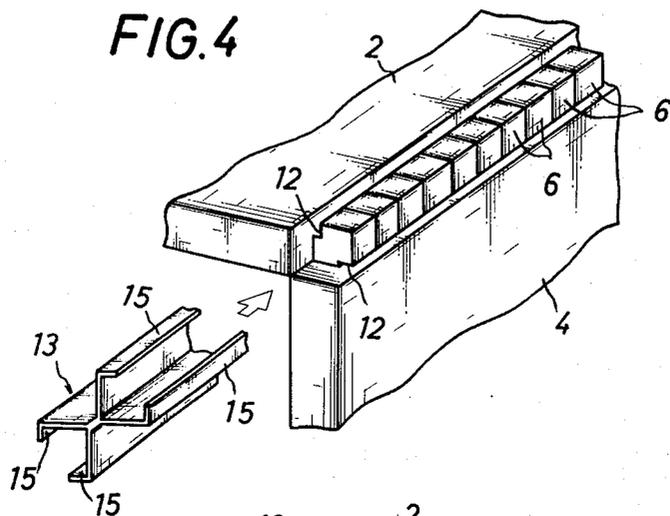


FIG. 5

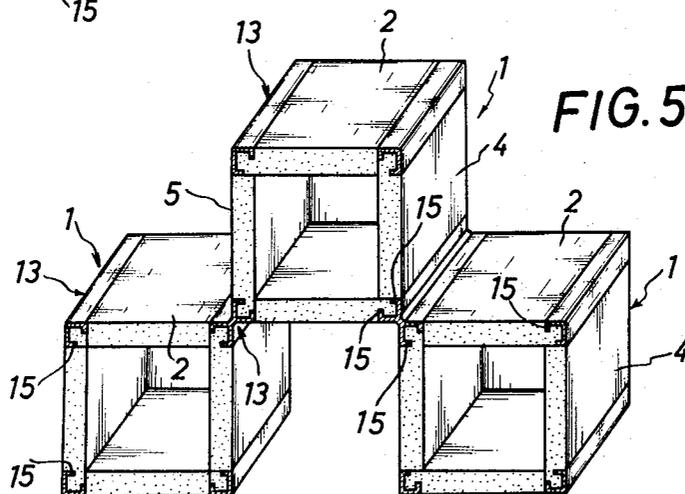


FIG. 6

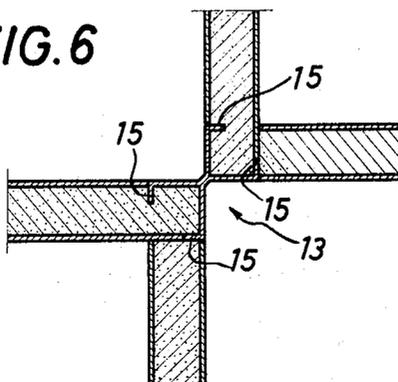


FIG. 7

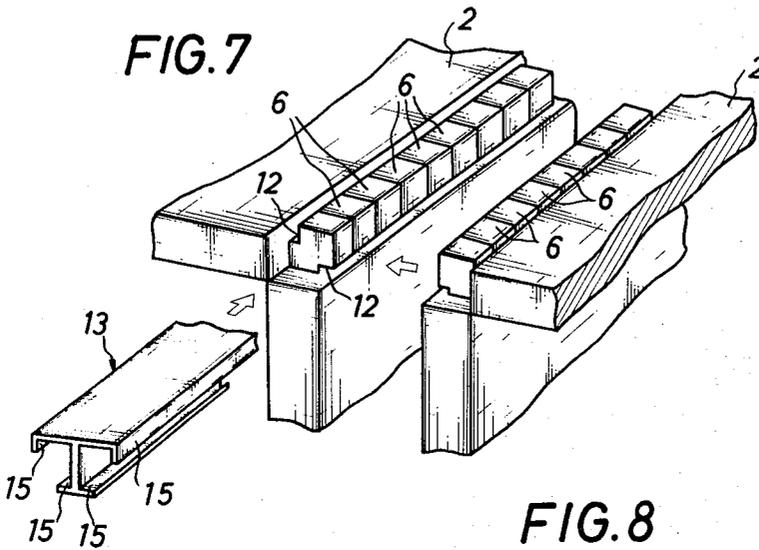


FIG. 8

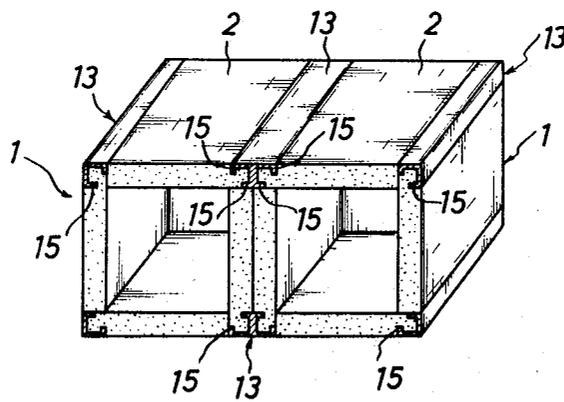
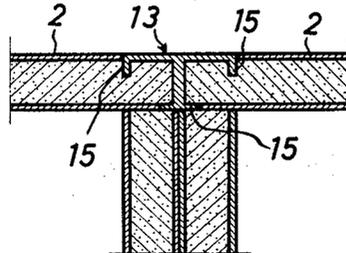


FIG. 9



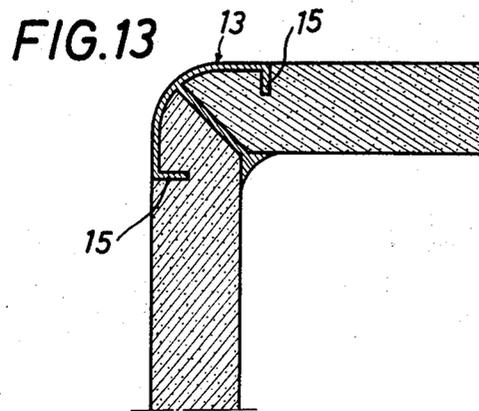
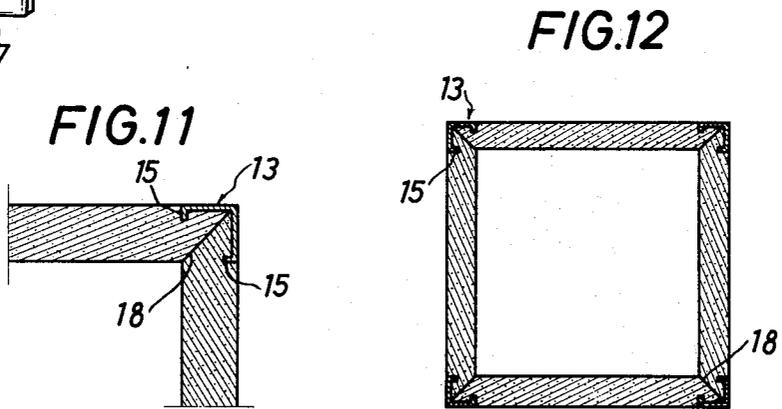
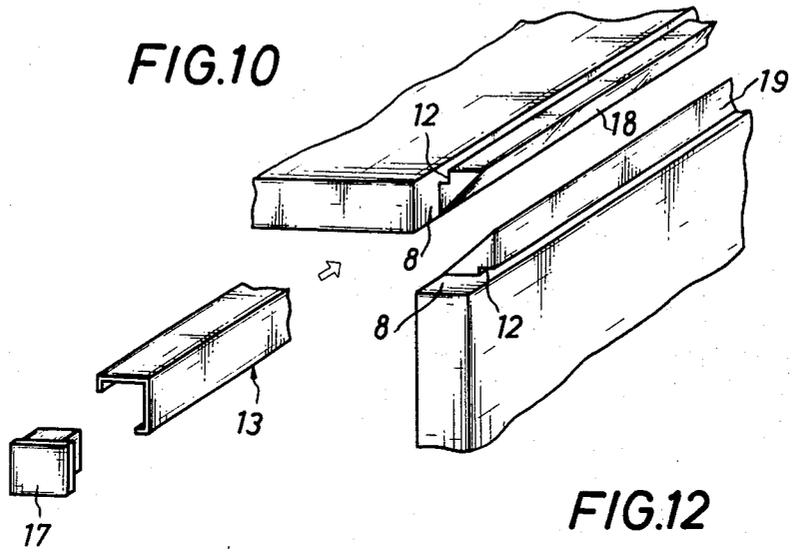


FIG.14

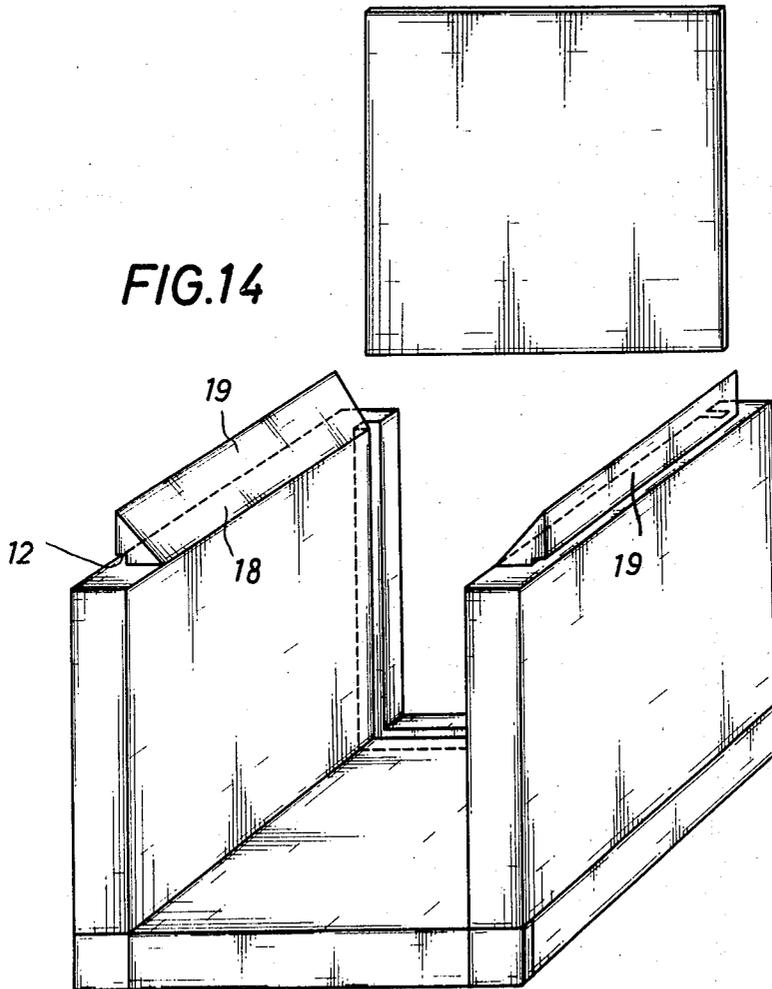


FIG.15

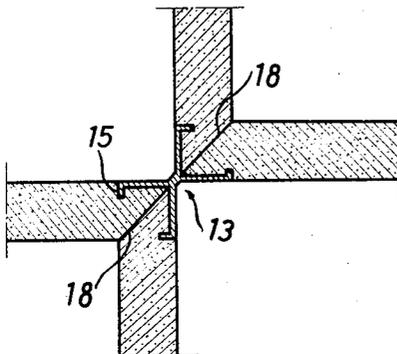


FIG.16

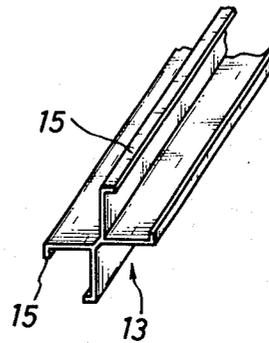


FIG.17

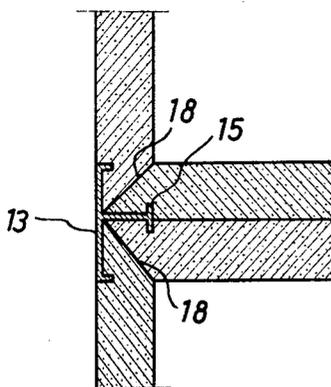
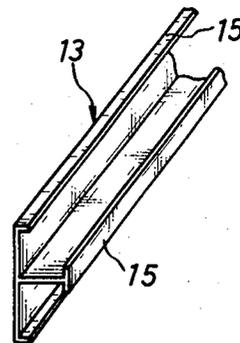


FIG.18



## BOX SHAPED FURNITURE UNIT

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention:

The present invention relates generally to furniture, and more particularly to box-shaped furniture which may be assembled in various different designs by connecting a plurality of box-shaped furniture units at their edges.

#### 2. Description of the Prior Art:

Furniture consisting of a plurality of box-shaped furniture units which can be connected in a vertical and horizontal array are well known. These box-shaped furniture units can be assembled in various ways depending upon the preference of their users, and have been conveniently used for bookshelves, display shelves, wine boards and the like.

Conventionally, in furniture of this kind, the box-shaped furniture unit is made of an upper board, right and left side boards, a bottom board, and a back board, and they are interconnected by inserting protuberances, disposed upon the end surfaces of the boards, into corresponding holes disposed upon the end surfaces of other boards. In the manufacture of this box-shaped furniture unit, the protuberances are somewhat difficult to form at the end surfaces of the boards for alignment with the holes disposed upon the end surfaces of other boards.

It would be easy to assemble the box-shaped furniture unit if continuous teethlike projections were disposed upon the end surfaces of the boards for interconnecting each of the boards by the interengagement of these teeth. However, in such an assembly, the connecting areas of the box would be unsightly particularly when a board which is known as a particle board is used. Also, the box could be disassembled while it is used if the boards were simply connected by the interengagement of the teeth, and in the instance where an adhesive agent is applied to the connecting area, it is usually subsequently squeezed out of the contacting area, which makes the appearance of the furniture even less appealing.

#### SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a box-shaped furniture unit, the connecting part of which is easy to manufacture in such a shape as to be able to connect each of the boards firmly and which is also pleasant in appearance.

Another object of the present invention is to provide a box-shaped furniture unit which can be assembled or disassembled easily by a simple operation without the use of screws or nails.

Still another object of the present invention is to provide a box-shaped furniture unit which can be connected in vertical, horizontal or diagonal directions so as to construct furniture having dimensions and a design as may be desired.

Yet another object of the present invention is to provide a box-shaped furniture unit which is simple in construction, and economical to manufacture on a mass production basis.

Briefly, the foregoing and other objectives are attained in accordance with the present invention through the provision of a box-shaped furniture unit having an open front, an upper board, right and left

side boards, a bottom board, and a back board. The right and left side boards are connected to the upper and the bottom boards at a right angle by interengaging teethlike projections disposed along the end surfaces of the boards with spaces or gaps formed between the projections disposed along the end surfaces of other boards. These projections may be cubic in shape and include two parallel notches which will become longitudinal straight channels for receiving a retaining member when two boards are assembled. The retaining member includes a substantially L-shaped body having lips or flanges bent inwardly at a right angle at the ends of the body so that they can be inserted into the longitudinal channels so as to retain the interengaged edges of the boards and to serve as a cover for the corners of the furniture unit. In another embodiment of the present invention, the projections disposed along end surfaces of each of the boards may be of triangular shape so as to be able to connect each of the boards at a right angle by contacting the respective sloped sides of the triangular projections. Also, the retaining member may be formed so as to have a cruciform body with tip bent inwardly at a right angle at its ends when it is designed for connecting two furniture units diagonally. Further, it may be formed in a T-shape when it is to be used for connecting two furniture units horizontally.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, features and attendant advantages of the present invention will be more fully appreciated as the same becomes better understood from the following detailed description when considered in connection with the accompanying drawings, in which like reference characters designate like or corresponding parts throughout the several views, and wherein:

FIG. 1 is a perspective view of a box-shaped furniture unit assembled in accordance with one embodiment of the present invention;

FIG. 2 is an exploded fragmentary perspective view of the box-shaped furniture unit showing the components for connecting the edges of the furniture unit shown in FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is an exploded fragmentary perspective view of the box-shaped furniture unit showing another embodiment for connecting the edges of the furniture units in accordance with the present invention;

FIG. 5 is a perspective view of the box-shaped furniture units showing the condition of connecting three furniture units diagonally, the front edges of the furniture units being shown in a cross section;

FIG. 6 is an enlarged fragmentary sectional view of the connecting portion of the furniture units shown in FIG. 5;

FIG. 7 is an exploded fragmentary perspective view of the box-shaped furniture unit showing still another embodiment for connecting the edges of the furniture units in accordance with the present invention;

FIG. 8 is a perspective view of the box-shaped furniture units showing the condition of connecting two furniture units horizontally, the front edges of the furniture units being shown in a cross section;

FIG. 9 is an enlarged fragmentary sectional view of the connecting portion of the furniture units shown in FIG. 8;

FIG. 10 is an exploded fragmentary perspective view of the box-shaped furniture unit showing yet another embodiment for connecting the edges of the furniture unit in accordance with the present invention;

FIG. 11 is a fragmentary sectional view of the connecting portion of the furniture unit shown in FIG. 10;

FIG. 12 is a vertical sectional view of the furniture unit assembled in accordance with the embodiment shown in FIG. 10;

FIG. 13 is a fragmentary sectional view of a connecting portion of a furniture unit in accordance with still another embodiment of the present invention;

FIG. 14 is an exploded perspective view of the furniture unit shown in FIGS. 10, 11, and 12;

FIG. 15 is a fragmentary sectional view of the furniture units showing the condition of diagonally connecting the two furniture units shown in FIGS. 10, 11, 12 and 14;

FIG. 16 is a fragmentary perspective view of a retaining member for connecting the two furniture units shown in FIG. 15;

FIG. 17 is a fragmentary sectional view of the furniture units showing the condition of vertically connecting the two furniture units shown in FIGS. 10, 11, 12 and 14; and

FIG. 18 is a fragmentary perspective view of a retaining member for connecting the two furniture units shown in FIG. 17.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, and more particularly to FIGS. 1, 2, and 3 thereof, a box-shaped furniture unit, generally indicated by the reference character 1, of the present invention comprises an upper board 2, a bottom board 3 and right and left side boards 4 and 5, respectively, each end surface of the boards for interconnecting the upper board 2, the bottom board 3 and right and left side boards 4 and 5 being provided with toothlike projections 6 and spaces or gaps 7 which are disposed alternately along the end surfaces 8 of each of the boards. As shown in FIG. 2, the projections 6 may be cubic in shape and the outer surfaces 9 of the projections 6 are positioned within a plane which lies parallel to, but inside of, a plane containing the outer surfaces 10 of the boards. Each projection 6 includes two perpendicularly oriented notches 11 which will become longitudinal channels 12 (see FIG. 4) when two boards are connected by interengaging the projections 6 and spaces 7 of one board with the projections 6 and spaces 7 of another board.

A retaining member generally indicated by the reference character 13 may be made of any one of a variety of materials, such as, for example, plastic, metal, or the like and includes a substantially L-shaped body 14 with flanges or lips 15 formed inwardly at a right angle relative to the respective L-shaped or leg portions of the body 14. The lips 15 of the retaining member 13 are to be inserted into the channels 12 formed upon connecting together two boards, and when the retaining member 13 is inserted into the channel 12, the outer surfaces 9 of the connected projections 6 are then covered with the body 14 of the retaining member 13 so that the outer surfaces of the retaining member 13 may now be in the same plane as the outer surfaces of the boards

10. The front and rear openings 16 of the retaining member 13 are closed by end caps or plugs 17.

In assembling the box-shaped furniture unit 1, as explained in the above embodiment, each of the boards is connected so as to interengage the projections 6 and spaces 7, and the connected parts of the boards are then covered with the retaining member 13 by inserting the lips or flanges 15 of the retaining member 13 into the channels 12 either from the front or the rear of the furniture unit 1, the front and rear openings 16 of the retaining member 13 then being closed by the plugs or caps 17. The retaining member 13 may of course be fixed to the corners of the furniture unit from the side direction, as opposed to the end directions as heretofore noted, by spreading the L-shaped or leg portions of member 13 outwardly.

In this assembled condition, if a force is applied to the furniture unit 1 in the vertical or horizontal directions, the force from the vertical direction is absorbed by both the top and bottom surfaces of the retaining members 13 and the lips 15 of the retaining members 13 projecting upwards and downwards into the channels 12 of the projections 6, while the force from the horizontal direction is absorbed by both the side surfaces of the retaining member 13, which are placed in both the right and left side corners of the furniture unit in parallel fashion, and the lips 15 of the retaining member 13 projecting horizontally into the channels 12 of the projections 6.

Referring now to the embodiment shown in FIGS. 4, 5 and 6, the box-shaped furniture units according to this embodiment are shown to be connected alternately in the up and down or right and left directions as shown in FIG. 5, each interconnection being along a diagonal. The retaining member 13, used in this embodiment is in the shape of two retaining members 13 shown in the preceding embodiment integrally connected at the corners, the resulting configuration being basically X-shaped or that of a cruciform.

In this embodiment, each furniture unit can be disconnected from the total array by removing the retaining members 13 from the corners of the furniture units 1, and the units can then be used as individual furniture units by replacing the member 13 of this embodiment with the retaining member 13 of the preceding embodiment. Similarly, if the retaining members 13 for connecting the edges of the furniture unit 1 shown in FIGS. 1, 2, and 3 are removed from the corners of more than two furniture units and the retaining member 13 shown in FIG. 4 is used, the furniture units 1 can then be connected alternately in the vertical and horizontal array of FIG. 5 by inserting the lips 15 of the retaining members 13 into the channels 12 of the projections 6 of the furniture units 1.

Referring now to the other embodiment shown in FIGS. 7, 8 and 9, the box-shaped furniture unit according to this embodiment is shown to be connected in a side-by-side or horizontal relationship. As shown in FIG. 7, the retaining member 13 used in this embodiment is in the shape of two retaining members shown in FIG. 2 integrally connected in back-to-back fashion, the resulting configuration being substantially T-shaped.

In this embodiment, each furniture unit 1 can be disconnected from the total array by removing the retaining members 13 from the corners of the furniture units, and the units can then be used as individual furniture

units by inserting the retaining member 13 shown in FIG. 2 into the channels 12 of the projections 6 of the furniture units 1. Similarly, if the retaining members 13 for connecting the edges of the furniture unit 1 shown in FIG. 1, 2 and 3 were removed from the corners of more than two furniture units and the retaining members 13 shown in FIG. 7 be used, then the furniture units could be connected in side-by-side relationship to form a horizontal array as shown in FIG. 8.

Referring now to the other embodiment shown in FIGS. 10 to 18, the box-shaped furniture unit 1 according to this embodiment is assembled by contacting sloped surfaces 18 of triangular projections 19 disposed upon the end surfaces 8 of each of the joints of the furniture units and retaining the corners of the furniture units with the retaining member 13. The retaining member 13 is the same shape and construction as explained in the preceding embodiment shown in FIG. 2, and the triangular projections 19 include the longitudinal channels 12 into which the retaining member 13 is inserted. A plurality of the box units 1 can be connected diagonally or vertically by the retaining members 13 shown in FIGS. 16 and 18, respectively.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings, such as, for example, the corner of the box may be rounded as shown in FIG. 13. It is to be understood, therefore, that within the scope of the appended claims the invention may be practiced otherwise than as specifically described herein.

What is claimed as new and desired to be secured by letters patent of the United States is:

- 1. A box-shaped furniture unit comprising: an upper board, right and left side boards, and a bottom board; means interengaged with each other for intercon-

necting and supporting each of the ends of said boards at a right angle, said means being disposed upon both ends of each of said boards; channels disposed upon said connecting means in parallel with the end surfaces of said boards; and a retaining means for holding together each of the corners of the box unit, said retaining means being inserted within said channels of said connecting means so as to cover said connecting means.

2. A box-shaped furniture unit as set forth in claim 1, wherein said means for interconnecting each of the ends of said boards comprises a plurality of uniformly spaced teethlike projections disposed upon said end surfaces of said boards for substantially the entire length thereof.

3. A box-shaped furniture unit as set forth in claim 1, wherein said means for interconnecting each of the ends of said boards comprises triangular projections extending along said end surfaces of said boards for substantially the entire length thereof.

4. A box-shaped furniture unit as set forth in claim 1, wherein said retaining means includes a substantially L-shaped body having at least two leg members with lips projecting at a right angle relative to said leg members of said body.

5. A box-shaped furniture unit as set forth in claim 1, wherein said retaining means includes a substantially cruciform body having at least two leg members with lips projecting at a right angle relative to said leg members of said body.

6. A box-shaped furniture unit as set forth in claim 1, wherein said retaining means includes a substantially T-shaped body having at least two leg members with lips projecting at a right angle relative to said leg members of said body.

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