

[54] DECORATIVE METAL GRID SYSTEM FOR
WINDOWS

3,623,936 11/1971 Hotz 52/668 X

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[57] ABSTRACT

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[51] Int. Cl. E04c 2/42

[58] Field of Search 52/473, 664, 667,
52/668, 721; 287/189.36 A, 51; 211/182; 256/65

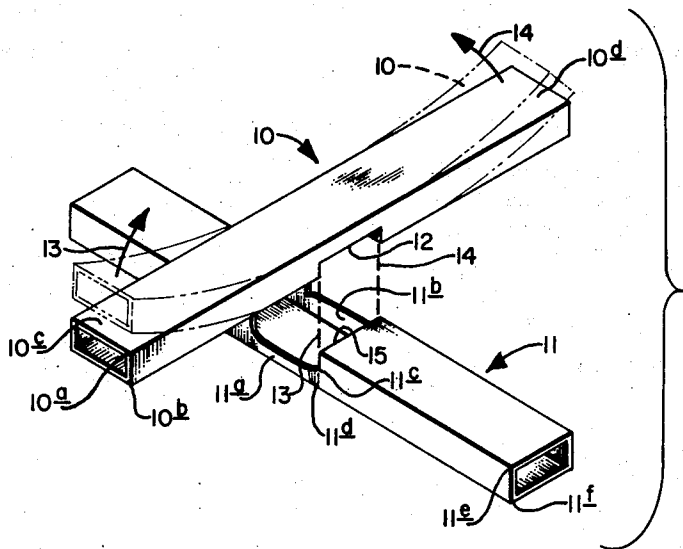
A decorative metal grid system for windows comprising two cross pieces of hollow rectangular tubular metal members interlocked together to form a rectangular or parallelogram patterned grid to be used on either single or insulated glazed windows and a method of joining such members together.

[56] References Cited

UNITED STATES PATENTS

1,789,280 1/1931 Armstrong 287/189.36 A X

7 Claims, 4 Drawing Figures



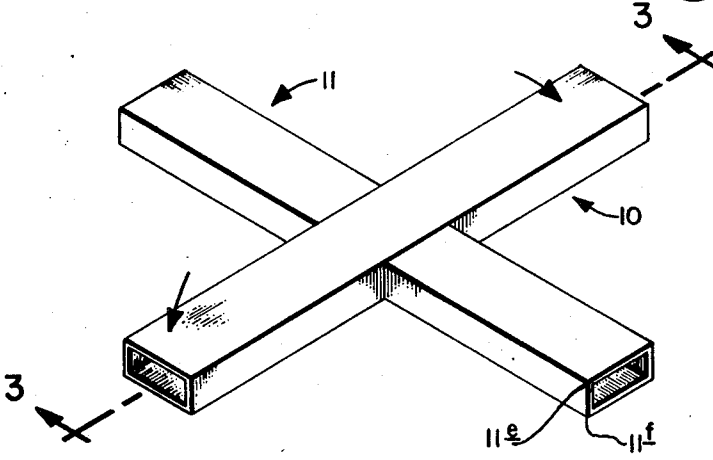
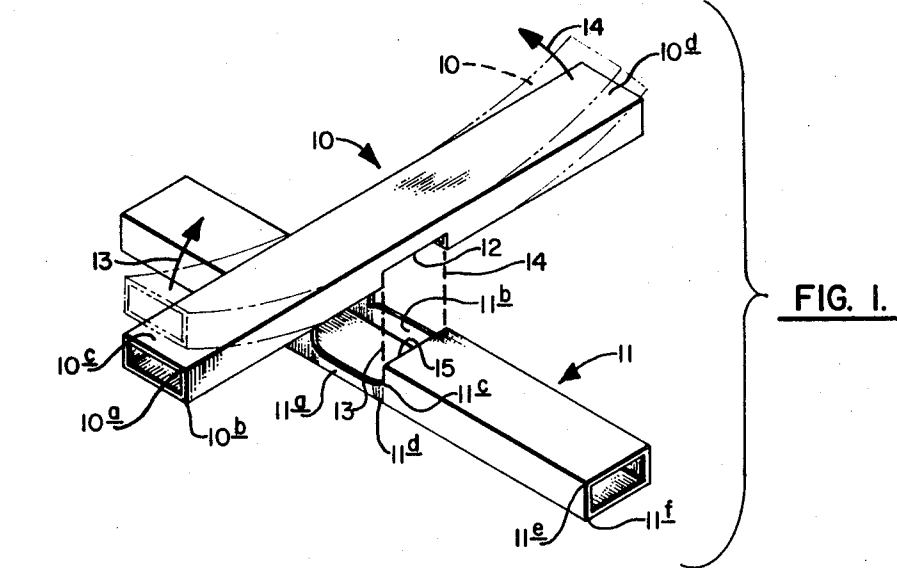


FIG. 2.

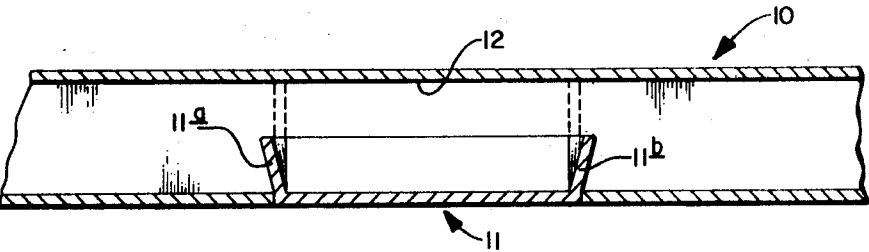


FIG. 3.

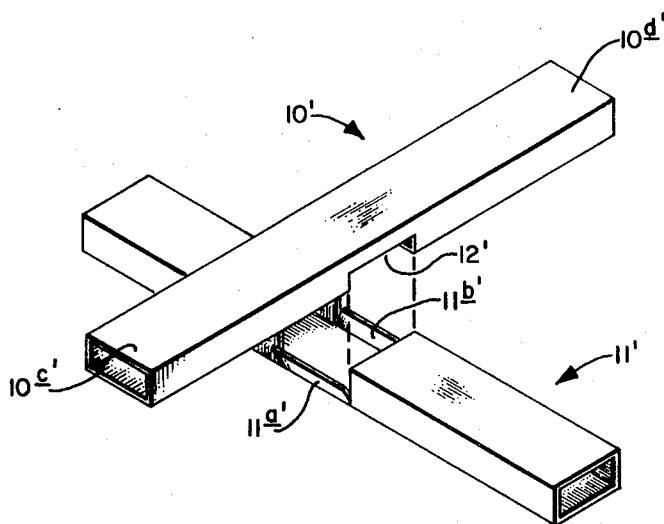


FIG. 4.

DECORATIVE METAL GRID SYSTEM FOR WINDOWS

BACKGROUND OF THE INVENTION

The present invention is in the general field of construction and relates particularly to the window or window framing business. Prior art muntins for forming decorative metal grid systems either parallelograms or rectangles are of tubular construction and are usually joined together by cross lock clips. Such clips are unsightly and also expensive and sometimes become disassembled after they have been installed in the windows, making costly repairs necessary.

The present invention provides a simple and relatively inexpensive method of joining tubular members together and also provides a false muntin for single glazed windows which is readily removable.

SUMMARY OF THE INVENTION

The present invention relates to a new and improved cross-lap joint and to a method of forming such joint. The novel cross-lap joint of the present invention is particularly adapted to be used with tubular members and more especially tubular members that have some flexibility, such as aluminum. In preparing the novel cross-lap joint of the present invention, a section is removed from each of two tubular members in the usual manner for making a standard cross-lap joint. The section removed corresponds to the width of the tubular member and to one-half of the height or depth of the tubular member wherein when the cross-lap is made and the members fitted together, both members are lying in the same plane. In one of the tubular members, the sidewalls below the area formed by the section removed are bent slightly outward away from each other. After such bending, the sidewalls may be described as having an outward bulge therein. In assembling the two tubular members to form the cross-lap, the members are placed at right angles to each other whereby the portions from which the section was removed are opposite each other and one outwardly bent sidewall on the novel tubular member may be inserted into the opened portion of the second normal tubular member. The normal tubular member is then flexed or bent upwardly a sufficient amount to enable each of the outwardly bent side walls on the novel tubular member to be inserted in the opening in the normal tubular member. The normal tubular member is then snapped over the second or novel tubular member to form a cross-lap or cross-lapped joint. The two members are thus tightly joined together with the exterior forming a neat cross-lap thereby eliminating the need for clips, fasteners, welding, brazing or any other means for assembling the cross-lap. The present invention is especially adapted for making muntins performing decorative "Colonial" (rectangular) or "Diamond" (parallelogram) pattern grids to be used on windows either single or insulated glazed. The novel muntins of the present invention are preferably made from aluminum with Alloy 5052 (Aluminum Association Designation) being especially preferred.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the two tubular members which comprise the cross-lap of the present invention and which are illustrated in position just prior to assembling;

FIG. 2 is a perspective view of the two tubular members of the present invention after they have been joined together to form the cross-lap;

FIG. 3 is a sectional view along line 3—3 of FIG. 2 illustrating how the outwardly bent sidewalls of one member fit into the opening of the second member to form a positive locking together of the two members; and,

FIG. 4 is a perspective view of an alternate of the unique tubular member of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, one tubular member 10 is illustrated as being above and at right angles to a second or unique tubular member 11. The member 10 has a section removed therefrom at 12 in the standard manner. The opening 12 corresponds to the width of the tubular member 11, as illustrated by the lines 13 and 14. The section 12 extends one-half the distance of the depth or height of the member from point 10a to point 10b. The member 10 is thus a standard or normal one-half cross-lap.

A section is removed from the member 11 to provide the opening 15 which is substantially identical to the opening 12 of the member 10. Additionally, the sidewalls 11a and 11b defined by the section removed therefrom are bent outwardly away from each other. The distance from point 11c to point 11d is one-half the distance or length of the height of the member 11 from point 11e to point 11f. The sidewalls 11a and 11b being bent outwardly or away from each other can be described as having a bulge therein. For relative ease of assembling, the sidewalls should not be bent outwardly any greater distance than is necessary to provide a tight fit of the cross-lap members.

In assembling the members 10 and 11, the members are placed at right angles and above each other as illustrated in FIG. 1 and the member 10 is flexed or bent as shown by arrows 13 and 14. The member 10 is thus slightly bent or flexed upwardly so that the end portions 10c and 10d of the member 10 are in a different plane from that of the member 10. Such flexing of the member 10 increases the size of the opening 12 a sufficient amount to receive the sidewalls 11a and 11b of the member 11. The sidewalls 11a and 11b are then inserted into the opening 12 of the member 10. The members 10 and 11 are then snapped together to form the cross-lap as illustrated in FIG. 2.

Referring now to FIG. 3 of the drawing, the position of the sidewalls 11a and 11b of the member 11 are readily seen in their locked position in the opening 12 of the member 10.

In an alternate embodiment of the invention, as seen in FIG. 4, the member 10' is identical with the member 10. The unique tubular member 11' is similar to the member 11, but the sidewalls 11a' and 11b' are hinged for facilitating their being bent outwardly away from each other. In the tubular member 11', cuts are extended along the edges where the section was removed therefrom to the bottom or top side of the alternate tubular member, depending upon which way the member lays. Such cuts form the pair of opposing hinges, wings or legs 11a and 11b, which are bent slightly outwardly or away from each other.

The two tubular members 10' and 11' are assembled to form a cross-lap in substantially the same manner as

the members 10 and 11. The rectangular tubes 10' and 11' are placed at right angles to each other whereby the areas from which the section was removed are opposite each other and one hinge on the alternate tubular member 11' may be inserted into the opened portion of the normal tubular member 10'. The normal tubular member is then flexed or bent upwardly a sufficient amount to enable the second hinge on the alternate tubular member 11' to be inserted in the opening in the normal tubular member opposite the opening wherein the first hinge member was placed. For example, the hinge 11a' is inserted into the portion of the opening 12' extending toward the end 10c' of the member 10'. The member 10' is then slightly bent or flexed upwardly so that the end portion 10d of the member 10 is in a different plane from that of the member 10'. The flexing of the member 10' increases the size of the opening 12' a sufficient amount to receive the other hinge 11b' of the member 11'. The sidewall 11b' is then inserted into the portion of the opening 12' towards the end 10d' of the member 10'. The members 10' and 11' are then snapped or joined together to form a cross-lap as illustrated in FIG. 2.

The view shown in FIG. 3 is applicable to the members 10' and 11' when joined together in cross-lap position as well as to the members 10 and 11.

It can readily be seen that assembly of the two embodiments of the invention which form the cross-lap can be varied, wherein one member is flexed sufficiently to receive both sidewalls or hinges at the same time or one at a time.

The present invention provides a novel cross-lap for tubular members, especially aluminum tubular members, which can be quickly and easily assembled without the necessity of any additional fastening members or fastening means. A frictionally tight cross-lap is provided which firmly holds the two members in the desired position.

Although the present invention is preferably made of aluminum or aluminum alloys, it can also be made from other types of material, such as steel and plastic. The materials used must have sufficient flexibility that they can be joined together or form the cross-lap without significant damage to the members, and must be of sufficient structural integrity for the purpose used.

The term "aluminum" includes aluminum and aluminum alloys and especially those aluminum materials customarily used in the window or window framing manufacture.

The foregoing disclosure and description of the invention is illustrative and explanatory thereof, and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. An article of manufacture consisting essentially of

a cross-lap joint of two rectangular tubular members, each of said members having a section removed therefrom to form a standard cross-lap joint, and the sidewalls defined by the section removed therefrom of one of said tubular members being bent outwardly from each other, whereby when said members are joined together to form the cross-lap joint they are locked together.

2. The article of claim 1, wherein said outwardly bent sidewalls are each bent outwardly in such manner as to form a bulge in each of said sidewalls.

3. The article of claim 1, wherein said outwardly bent sidewalls are each defined by cuts on each side thereof along the edges where the section was removed from said one of said tubular members, and said cuts being made in such manner that said sidewalls form opposing hinges.

4. The article of claim 1, wherein the tubular members are aluminum.

5. A decorative metal grid system for windows comprising a plurality of the article of manufacture of claim 1.

6. A novel cross-lap joint consisting of two rectangular tubular members each having a section removed therefrom so that when the two members are placed one upon the other at right angles to each other, the areas defined by the sections removed therefrom are opposite each other, thereby forming a standard cross-lap joint, and the sidewalls defined by the section removed therefrom of one of the tubular members are bent outwardly away from each other, whereby when said cross-lap joint is formed, said tubular members are locked together.

7. A method of joining two rectangular tubular members together, comprising the steps of:

- a. removing a section from each of said members so that when one of said members is placed over the other of said members in a right angle relationship, the areas defined by the sections removed are opposite each other and the two members lie in the same plane;
- b. bending the side walls defined by the section removed of one of the members outwardly and away from each other;
- c. placing one tubular member over the other tubular member in a right angle relationship so that the areas defined by the sections removed are opposite each other;
- d. flexing the tubular member having straight side walls a sufficient amount so that the opening defined by the section removed therefrom is sufficiently large to receive the outwardly bent side walls of the other tubular member; and
- e. joining the two tubular members together to form a cross-lap joint with the two members being locked together.

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