Jan. 16, 1951 C. L. WEBSTER 2,538,138

STORM DOOR FRAME

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FIG. 1.

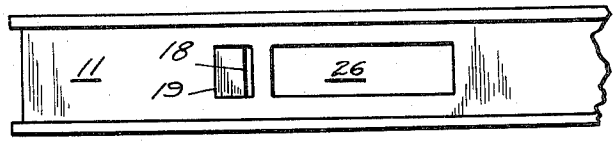


FIG. 3.

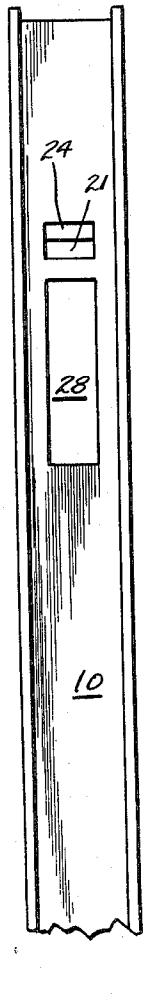


FIG. 2.

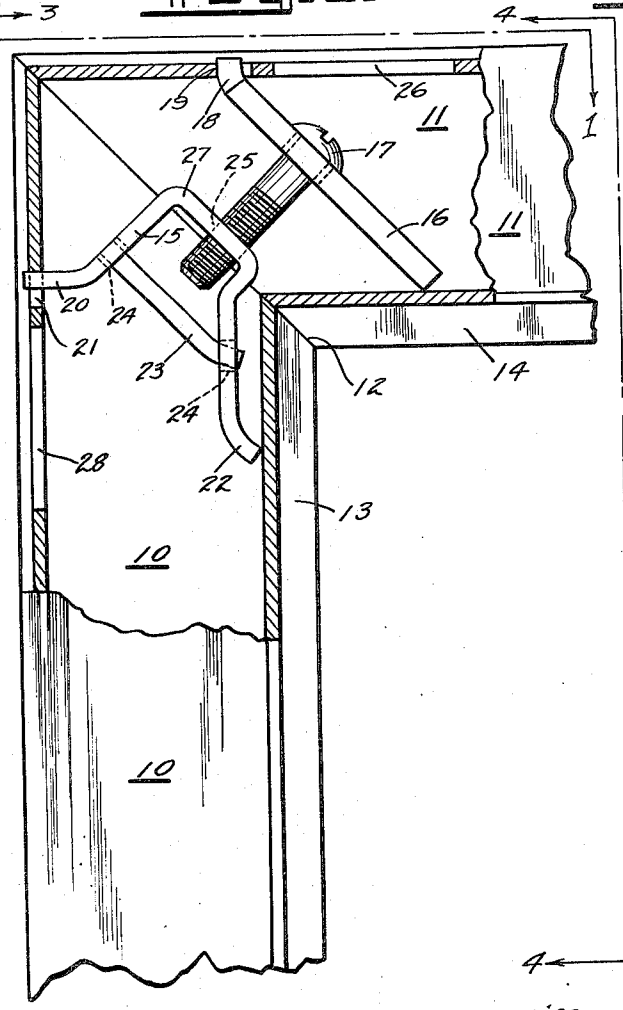
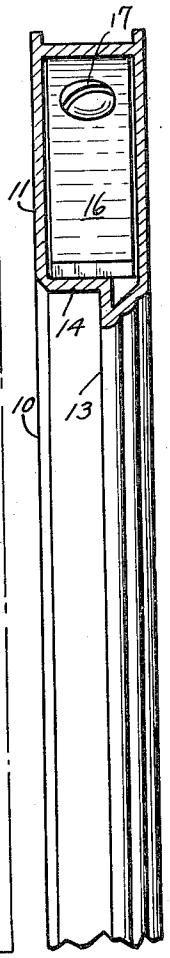


FIG. 4.



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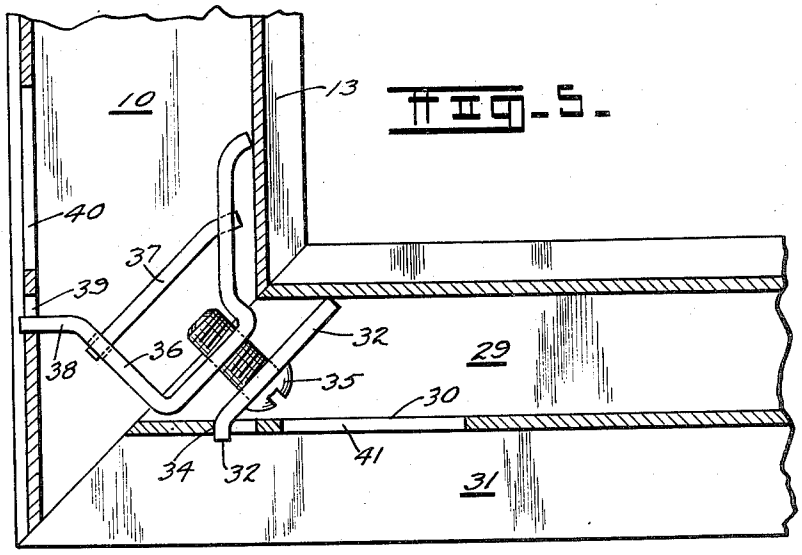


FIG. 5.

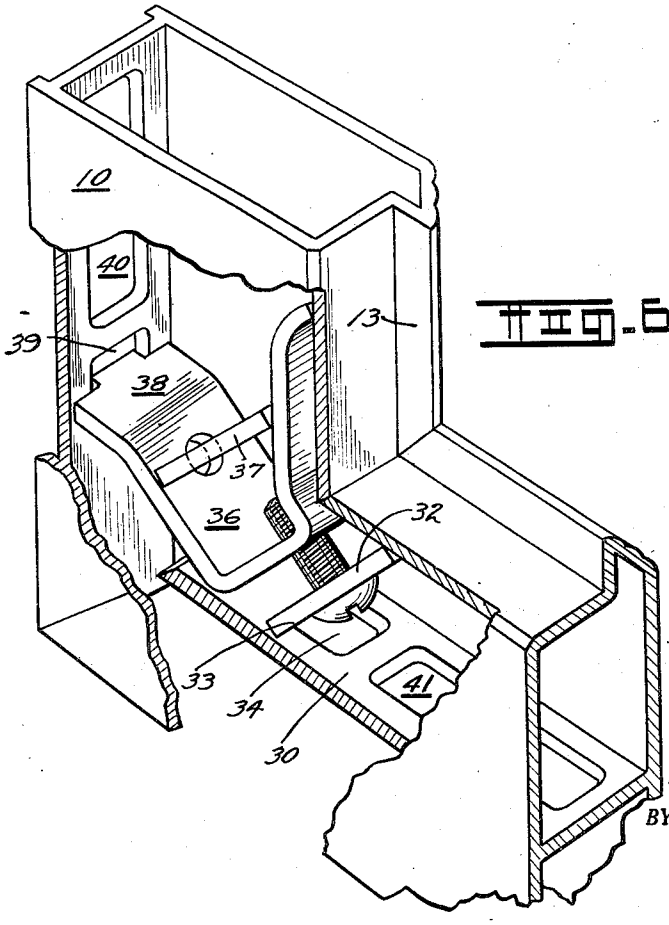


FIG. 6.

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STORM DOOR FRAME

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2 Claims. (Cl. 189—46)

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This invention relates to a storm door frame and more particularly to a method and apparatus for joining cut and mitered corners of framing sections to form a rectangular frame suitable for use as a storm door or the like.

The principal object of the invention is the provision of a storm door frame incorporating novel means for securing the corner portions thereof together.

A further object of the invention is the provision of a corner construction for framing sections and incorporating means for clamping end sections thereof to one another and securing the same against movement out of registry with one another.

A still further object of the invention is the provision of a simple and efficient means for uniting cut and mitered end sections of tubular framing material to one another and wherein the uniting means is positioned within the tubular sections to be joined.

A still further object of the invention is the provision of a corner construction for tubular framing members wherein cut and mitered end sections of the framing members are forcibly engaged one upon the other and held against twisting or other movement with respect to one another.

The storm door frame and method of securing the same together at the corners thereof as disclosed herein is particularly adapted for the construction of metallic storm doors such as those wherein the framing sections are of extruded aluminum and of a cross sectionally rectangular shape and adapted to receive glazed and/or screened sash. The metallic storm door constructions heretofore proposed have utilized such fastening means in joining the framing members thereof together as gussets and corner keys, none of which successfully held the framing members in desired end to end engagement with one another when the door was in daily use.

The present invention makes possible the use of a tubular framing construction and locates the fastening means within the ends of the cut and mitered sections of the framing construction and is easily installed therein, readily engaged and tightened and exerts tension endwise of the framing sections one upon the other and at the same time holds them against tilting or twisting action out of their normal plane. The construction is economically formed, easily installed and therefore comprises a substantial

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advantage in the art of metallic storm doors and the like.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawing, wherein:

Figure 1 is a top plan view of an upper corner of a storm door frame.

Figure 2 is a plan view of an upper corner of a storm door frame with parts broken away illustrating the fastening means therein.

Figure 3 is an end view taken on line 3—3 of Figure 2.

Figure 4 is an end view taken on line 4—4 of Figure 2.

Figure 5 is a plan view of a lower corner of a storm door frame with parts broken away and parts in cross section.

Figure 6 is a perspective view with parts broken away and parts in cross section showing a lower corner of a storm door frame and fastening means therein.

By referring to the drawings and Figures 1 through 4 in particular it will be seen that a vertical section 10 and a horizontal top section 11 of a storm door are shown as being cut and mitered and joined to one another at a point 12, it being observed that the framing sections 10 and 11 having longitudinally extending right angle flanges 13 and 14, respectively, which define an area in which glazed and/or screened sash (not shown) may be removably positioned as is customary in the art. The framing sections 10 and 11 are hollow tubular extrusions preferably of lightweight metal such as aluminum and are of the same cross sectional design.

In order that the cut and mitered framing sections 10 and 11 may be held in engagement, as shown in Figure 2 of the drawings, fasteners comprising a U-shaped body member 15 and a straight body member 16 are disposed one within the ends of each of the adjacent sections 10 and 11 and secured to one another by a bolt 17. The straight body member 16 has an end 18 thereof bent at an angle and positioned in registry with an opening 19 in the top wall of the section 11 while the U-shaped body member 15

has one of the arms thereof bent at an angle as at 20 and engaged in an opening 21 in the side wall of the section 10. Additionally, the other arm of the U-shaped member 15 is curved outwardly to form a projecting point 22 which engages the inner wall of the section 10, as best shown in Figure 2 of the drawings.

In order that the U-shaped body member 15 can be held against collapsing when the fasteners are tightened in forming the joint, a separator 23 is engaged at opposite ends in apertures 24—24 formed in oppositely disposed sections of the U-shaped body member 15. The bolt 17 is engaged in a drilled and tapped opening 25 in the base section of the U-shaped body member 15. It will thus be seen that when access is had to the head of the bolt 17 as by way of an access opening 26 in the top wall of the top section 11 and the bolt 17 revolved as by a screw driver, the resulting action will be to forcibly engage the U-shaped body member 15 against the inner wall of the section 10 and cause the point 22 on the U-shaped body member 15 to engage the material thereof and thereby firmly position the body member 15 in place as its angle arm 20 is engaged in the opening 21 in the outer wall of the section 10.

It will be observed that the base section of the body member 15, indicated by the numeral 27, moves into position across the point 12 and partially within the end of the section 11. This serves to prevent the section 11 from twisting or turning with respect to the plane of the section 10. It will also be seen that the member 16 moves downwardly and to the left as shown in Figure 2 of the drawings when tension is applied by the bolt 17 as the end 18 thereof engages the opening 19 and is thereby held against sideward movement while the opposite end of the member 16 engages the lower wall of the member 11 and is urged tightly thereagainst by the clamping action. The net result of the clamping action is to first position the members 15 and 16 in desired relation to the sections 10 and 11 and, secondly, to urge the sections 10 and 11 toward one another and thus firmly join the same on the point 12, it being observed that the base section 27 of the U-shaped body member 15 lies within the end of the section 11 and also prevents the same from twisting or turning with respect to the section 10.

The device is easily held in position in the ends of the sections 10 and 11 during installation and initial tightening action as a secondary aperture 28 is provided in the side wall of the section 10 immediately below the opening 21 heretofore referred to. It will be observed that both of the upper corners of the frame to be formed have identically arranged and positioned and actuated fastening means as just described in connection with Figure 2 of the drawings.

In forming the lower corners of the storm door or like device a modified horizontal section is utilized in which the bottom wall is moved inwardly with respect to the side walls so as to permit an adjustable member to be installed in the space therebelow. By referring to Figures 5 and 6 of the drawings the arrangement may be seen wherein the vertical side member 10 is joined at its bottom to a matching cut and mitered bottom section 29, the lower wall 30 of which is elevated with respect to the bottoms of the side walls thereof so as to form a space generally indicated by the numeral 31 in which

a U-shaped extension (not shown) may be positioned so as to enable the door to correspond with a regular door sill or the like.

The fastening construction between the portion 10 and the portion 29 is very similar to that heretofore described in connection with Figure 2 of the drawings with the exception that a shorter straight fastening member 32 is utilized in place of the longer fastening member 16 as disclosed in Figure 2 of the drawings. The straight fastening member 32 has an outturned end section 33 which is engaged in an opening 34 in the bottom wall 30 of the portion 29 and the opposite end of the member 32 engages against the top wall of the member 29. A bolt 35 is positioned through an opening in the straight member 32 and threadably engaged in a U-shaped body member 36 which corresponds exactly with the body member 15 heretofore referred to in connection with Figure 2 of the drawings. The body member 36 has a separator piece 37 and has an outturned end 38 which engages an opening 39 in the side wall of the section 10.

An opening 40 is formed above the opening 39 to provide access into the interior of the section 10 and an opening 41 is formed in the bottom wall 30 of the portion 29 so that a screw driver or other tool may be engaged upon the bolt 35 and the same revolved to effect the tightening action.

It will be observed that tightening action between the bottom section 10 and the bottom horizontal section 29 is exactly the same as between the upper end of the section 10 and the horizontal section 11 heretofore referred to.

It will thus be seen that the cross sectionally rectangular sections 10, 11 and 29 are joined together to form a rectangular frame and that the means joining the sections at their cut and mitered end sections are completely enclosed in the same and further that they form an efficient rigid and inexpensive construction easily assembled and operated and thereby meets the several objects of the invention.

Having thus described my invention, what I claim is:

1. A frame formed of four cut and mitered framing sections, said framing sections being of rectangular cross section and having openings in their outermost walls adjacent the ends of the said sections, a fastener assembly located in each of the corners of the frame and comprising a U-shaped body member positioned in one of the said framing sections and extending outwardly therefrom and lying partially within the other of the said framing sections, a separator engaged between the arms of the said U-shaped fasteners to prevent the same from collapsing upon itself and one of the arms of the said U-shaped fasteners engaged in one of the said openings, a straight bar positioned in the other of the said framing sections and having one end engaged in one of the said openings and a bolt positioned through said bar and threadably engaging the said U-shaped fasteners whereby the fasteners and the framing sections may be urged toward one another and suitably clamped together.

2. A frame formed of four cut and mitered framing sections, said framing sections being of rectangular cross section and having openings in their outermost walls adjacent the ends of the said sections, a fastener assembly located in each of the corners of the frame and comprising a U-shaped body member positioned crosswise in one of the said framing sections and extending

outwardly therefrom and lying partially within the other of the said framing sections, a separator engaged between the arms of the said U-shaped fasteners to prevent the same from collapsing upon itself and one of the arms of the said U-shaped fasteners engaged in one of the said openings, a straight bar positioned crosswise in the other of the said framing sections and having one end engaged in one of the said openings and a bolt positioned through said bar and threadably engaging the said U-shaped fasteners whereby the fasteners and the framing sections may be urged toward one another and suitably clamped together.

CLIFFORD L. WEBSTER.

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