

United States Patent

Collins

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[54] **CORNER CONSTRUCTION FOR
AQUARIUM OR THE LIKE**

[72] Inventor: **David R. Collins**, R.D. 1, Newtown, Pa.
18940
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2,580,029	12/1951	Krauss	312/114
3,477,182	11/1969	Fulton	220/84 X
3,434,749	3/1969	Meyer	287/20.92 C
3,398,854	8/1968	Neuberger	220/80
3,276,831	10/1966	Lappin	312/140 X

Primary Examiner—George E. Lowrance
Attorney—Sperry and Zoda

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220/81, 220/84, 287/20.9 ZD, 287/54 B,
287/189.36 H
[51] Int. Cl. B65d 7/32, A01k 64/00, F16b 9/02
[58] Field of Search 220/80, 81 R, 84, 4 R, 84 R;
287/54 A, 54 B, 20.92 C, 20.92 D, 20.92 P, 20.92 J,
20.92 K, 20.92 T, 20.92 R, 89.36 R, 189.36 H;
312/114, 140, 119/5

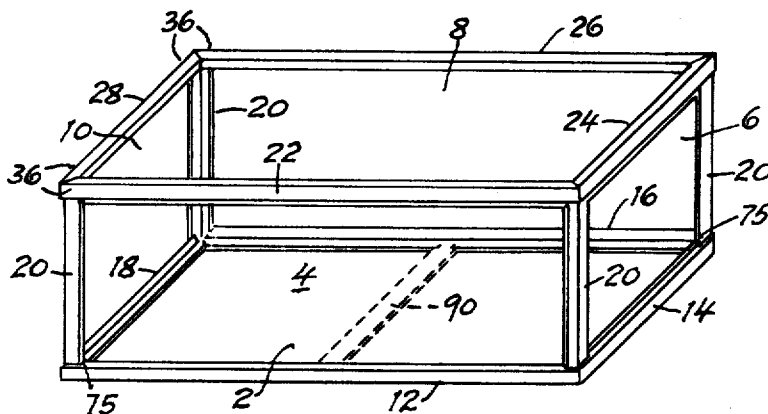
[56] **References Cited**

UNITED STATES PATENTS
3,144,265 8/1964 Humble.....287/54 B

[57] **ABSTRACT**

A three-dimensional framing assembly adapted for use in the construction of aquariums, show cases, tables and other structures wherein three intersecting members, which may be formed of extruded metal strips, are assembled to form a corner construction that is neat in appearance and strongly connected. The assembly in some instances may be designed for the reception of glass, slate or other panels in a manner to prevent leakage between such panels and the framing members.

7 Claims, 11 Drawing Figures



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3 Sheets-Sheet 1

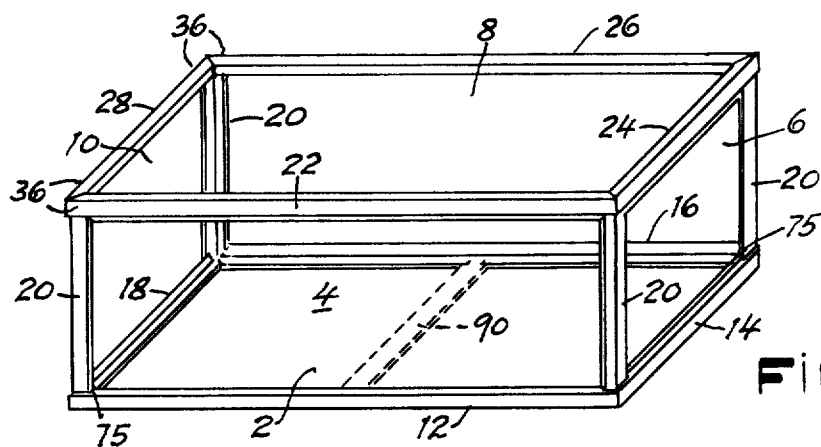


Fig. 1.

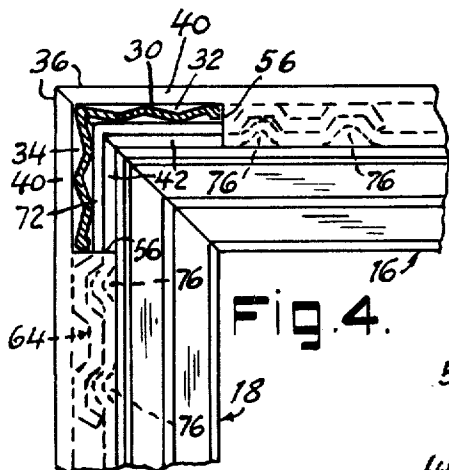


Fig. 4.

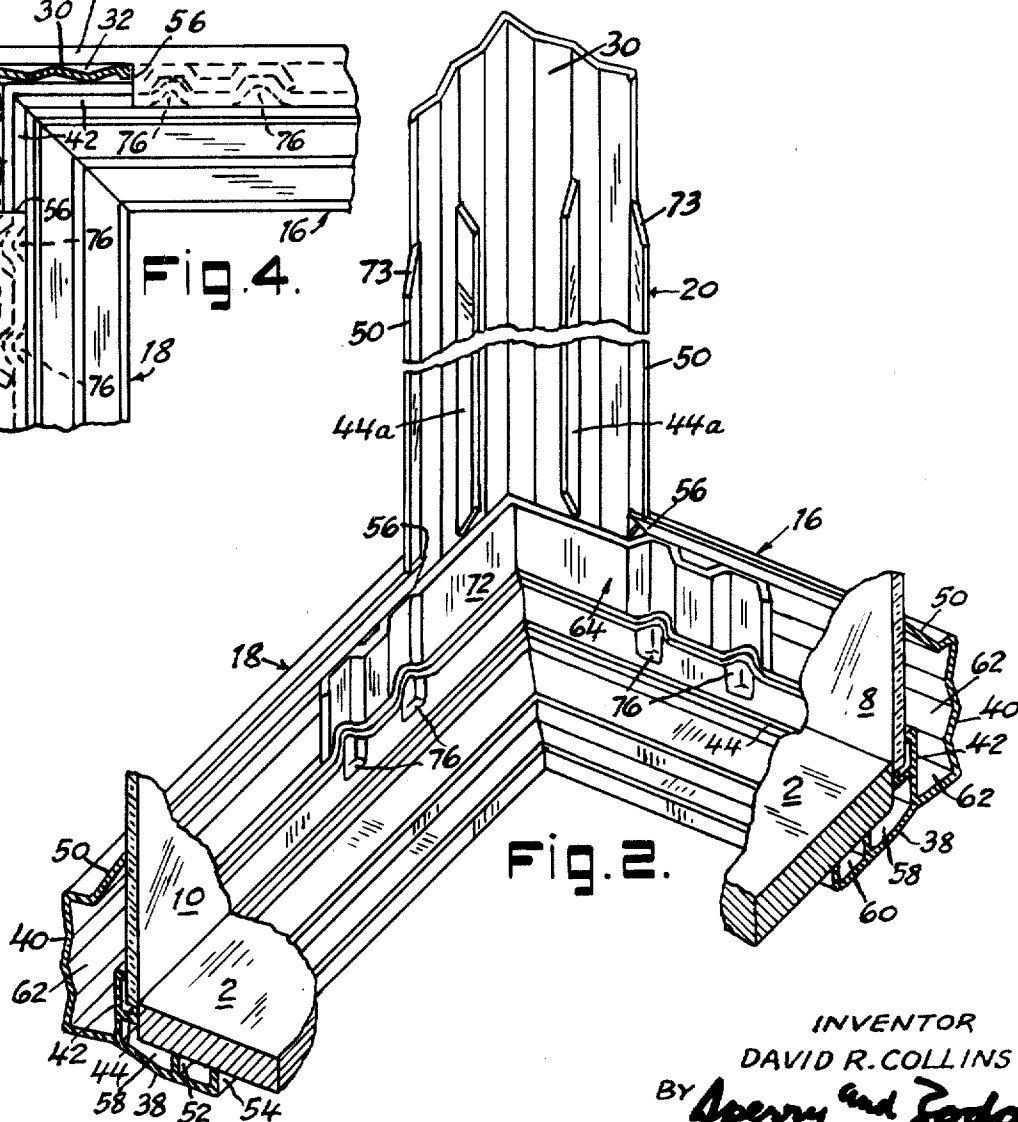
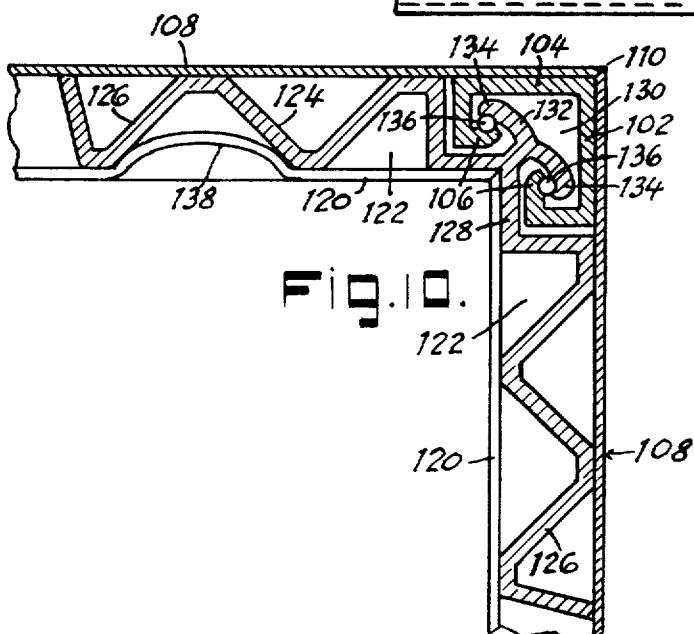
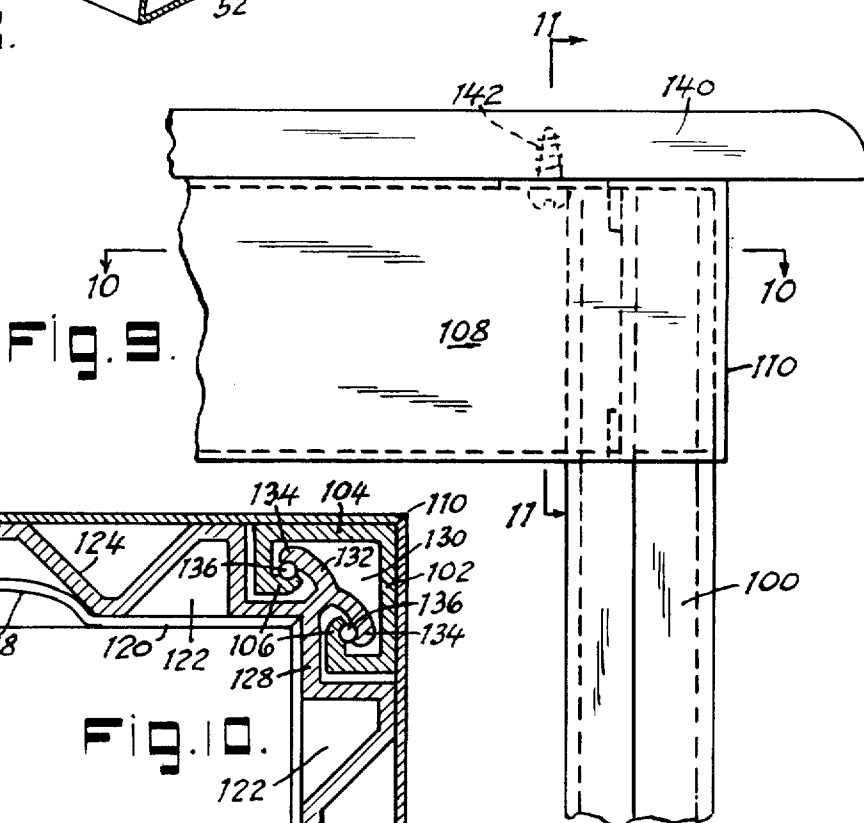
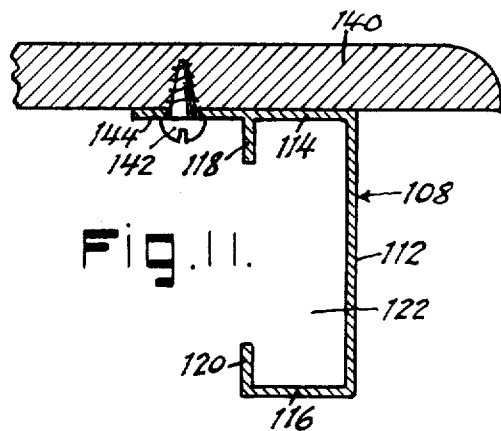
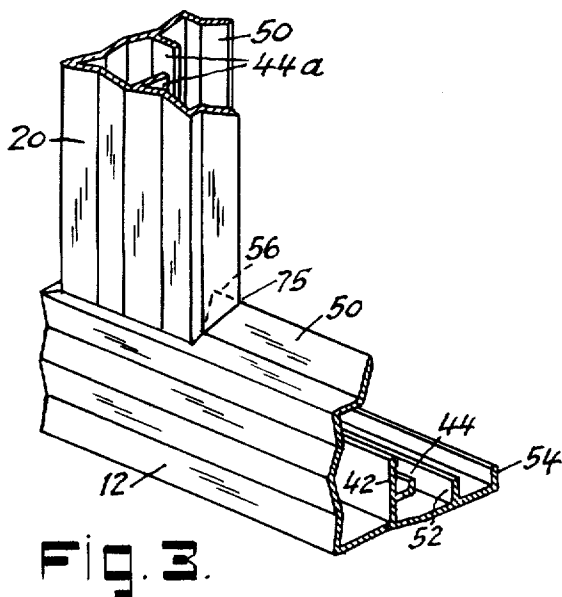


Fig. 2.

INVENTOR
DAVID R. COLLINS
BY *Operry and Zoda*
ATTORNEYS



INVENTOR
DAVID R. COLLINS
BY *Sperry and Joda*
ATTORNEYS

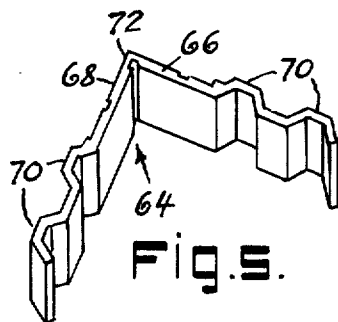


Fig. 5.

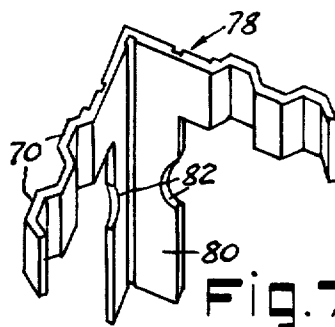


Fig. 7.

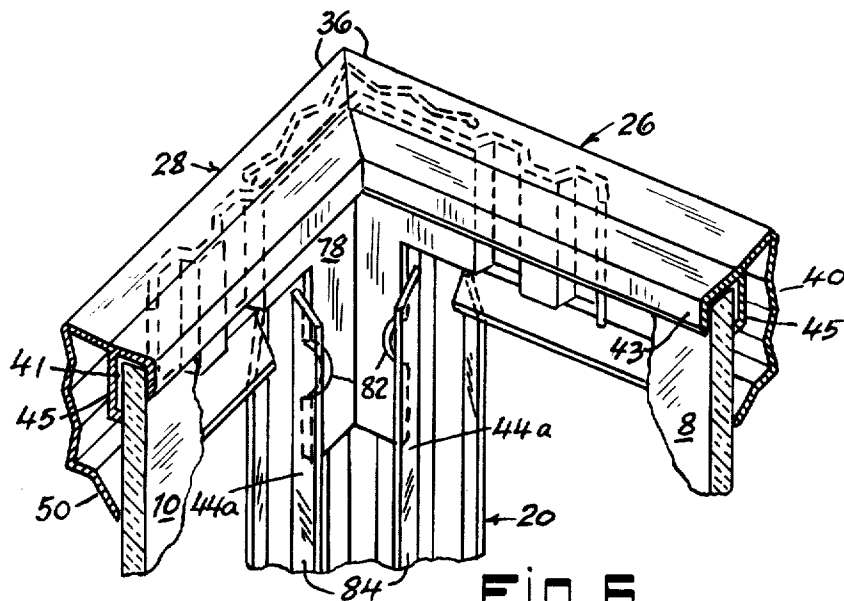


Fig. 6.

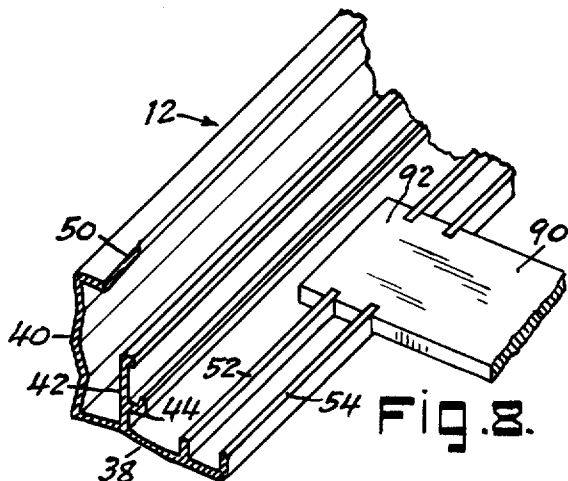


Fig. 8.

INVENTOR
DAVID R. COLLINS
BY *Sperry and Joda*
ATTORNEYS

CORNER CONSTRUCTION FOR AQUARIUM OR THE LIKE

FIELD OF INVENTION

It is common practice to construct aquariums, show cases, tables and other structures with metal framing members which are arranged to form a corner wherein three members are connected together to form a corner of the structure. However, it is difficult to arrange and connect three members together in such a way as to provide a neat and attractive appearance while providing the requisite strength. Furthermore, when the construction is designed to support panels or sheets of material such as the glass sheets which form the sides of an aquarium, it is necessary for the construction to be water-tight or leak-proof. In such assemblies the sealant or caulking material applied to the joints for preventing the flow of liquid between gosses or other panels and the framing members frequently clean-up operations.

THE PRESENT INVENTION

In accordance with the present invention framing members for forming the corners of aquariums and other constructions, are formed of aluminum or other extruded strips of material. These members preferably are formed at their contacting ends so as to present a neat attractive appearance wherein two of the members are mitered at their ends and combine to provide an opening or recess for receiving one end of a third member. One or more keys or concealed fastening means fit into the abutting ends of the framing members to secure them together so as to provide a strong, tight, connection. The framing members further may be formed to present both sealant receiving cavities for the reception of a caulking composition and sealant overflow cavities serving to establish a water-tight and leak-proof connection between the framing members and any glass, slate or other panels of sheet material while confining any excess sealant to concealed areas of the aquarium or enclosure.

THE DRAWINGS

In those forms of the invention illustrated in the drawings:

FIG. 1 is a perspective illustrating a typical form of aquarium embodying the present invention;

FIG. 2 is a perspective showing the interior of one lower corner construction of the aquarium of FIG. 1 with portions broken away;

FIG. 3 is a perspective showing the exterior of the lower corner assembly of FIG. 2;

FIG. 4 is a plan view of the mitered ends of two abutting framing strips employed in the construction of FIG. 1;

FIG. 5 is a perspective of an L-shaped key which may be employed in securing the mitered ends of two upper and lower framing strips together;

FIG. 6 is a perspective showing a portion of an upper corner of the framing assembly of FIG. 1;

FIG. 7 is a perspective of a three armed key which may be used in securing the strips of the assembly in FIG. 5 together;

FIG. 8 illustrates a modification of the applicant's construction;

FIG. 9 is a side elevation of a corner of a table embodying the present invention;

FIG. 10 is a horizontal cross section of the construction of FIG. 9 taken on the line 10—10 thereof; and

FIG. 11 is a vertical sectional view taken on the line 11—11 of FIG. 9.

In that form of the invention chosen for purposes of illustration in FIGS. 1 to 7 of the drawings the framing assembly is shown as used in an aquarium having a bottom 2 which may be formed of a panel of slate or the like. The aquarium has sides 4, 6, 8, and 10 of which two or more may consist of panels of glass or the like. The marginal edges of the bottom and sides of the aquarium are secured and held in place by framing strips which are joined together at the upper and lower corners of

the aquarium. Thus the framing strips 12, 14, 16, and 18 extend about the edges of the aquarium at the bottom. Vertical corner posts 20 extend upwardly at each of the corners of the aquarium and the framing strips 22, 24, 26, and 28 extend about the top of the aquarium.

Each of the framing strips, including the corner posts 20, may be formed of extruded aluminum plastic or other material so as to be uniform in cross section throughout the major portion of the length thereof whereas the upper and lower ends of the corner posts 20 may have side flanges 50 thereof removed for a short distance to provide reduced ends 30 adapted to be slipped or forced into a corner key receiving space 32 shown in FIG. 4. The spaces 32 are adjacent the mitered ends 36 at the corners of the lower framing strips 12, 14, 16, and 18 at the bottom of the aquarium and adjacent the mitered ends 36 of the upper framing strips 22, 24, 26, and 28 at the top of the aquarium.

The framing strips and corner posts are each generally right angular in cross section and are each provided with side portions as shown at 38 and 40 in FIG. 2. The lower framing strips are further provided with panel positioning means such as a web 42 which is carried by the lower side 38 of the lower framing strips 12, 14, 16, and 18 and projects upward therefrom so as to be generally parallel to and spaced from the other or outer side 40 of said strip. A rib 44 extends inward from each web 42 below the upper edge of the web to receive and support the lower edge of the glass or side panels shown as the panels 8 and 10 in FIGS. 1 and 2. The upper edge of each glass panel is positioned and held in place within a channel 41 formed by the downwardly extending webs 43 and 45 of framing members 22, 24, 26, and 28 as shown in FIG. 6.

The upper outer edges of the outer sides 40 of each of the framing strips have inwardly inclined flanges 50 which present an inner edge aligned with the inner face of the web 42 on the lower side 38 of the strip so as to engage the outer side of the glass panel 8 or 10, supported on the rib 44 of the strip. The lower side 38 of each of the bottom framing strips 12, 14, 16, and 18 further is provided with spaced upwardly extending ribs 52 and 54 which receive and support the slate panel or bottom 2 of the aquarium.

The web 42 of the side portion 38 of the horizontal members 12, 14, 16, and 18 is spaced from the outer side 40 of the framing strip to provide the corner key receiving cavity 32 for insertion of the key 64 or other securing means or material. Further, by removal of a portion of the inclined flange 50 adjacent the mitered ends of the horizontal framing strips 16 and 18 the reduced end 30 of the corner post 20 can be forced into the key receiving cavity 32.

In some instances it may be sufficient to secure the mitered ends 36 of the framing strips, and the reduced ends 30 of the corner posts 20, together by introducing a cementing or bonding material into the key receiving cavity 32 and into contact with the mitered ends. However, for most purposes it is desirable to employ a key 64 such as that shown in FIG. 5 for connecting the ends 36 of the framing members together at the corner of the aquarium. As shown in FIGS. 2, 3, and 4, the key 64 is generally L-shaped in form and has arms 66 and 68 provided with lateral depressions 70 of such size that they will frictionally engage the outer side of web 42 and the inner face of the side 40 of the framing strip so as to be housed within the space 32 at the mitered ends of the strips. The key 64 thus provides a strong mechanical connection between the framing strips producing a rigid assembly. Further, as shown in FIG. 4, the corner portion 72 of the key 64 fits closely against the webs 42 of the strips leaving room within the space 32 for the frictional or forcible insertion of the reduced end 30 of the corner post 20 into the space 32. The end portions of the inclined flanges 50 are removed as shown at 56 in FIG. 2 to permit such insertion whereby the outer faces of the reduced end 30 of the corner post positively bear against the inner faces of the outer sides 40 of each framing strip and against the outer sides of the corner portion 72 of the key 64. The inclined flanges 50 on the side portions of the corner posts 20

are removed adjacent the ends of each post to form the reduced ends 30 of the corner posts 20. In so removing the side flanges of the posts they are cut at an angle as shown at 73 in FIGS. 2 and 3 so as to lap over corners 56 of the flanges 50 on the horizontal members whereby the corners 56 are concealed and a neat mitered outer surface is presented as shown at 75 in FIG. 3. If desired the portions of the web 42 located adjacent the inner sides of the depressions 70 in the key may be struck outwardly as shown at 76 in FIGS. 2 and 4 to serve as stakes or positive connections to further secure the key 64 and the mitered ends 36 of the framing members together. In this way a neat and attractive but strong, rigid, assembly is provided for securing the framing members together.

The corner construction and connection of the upper framing members 22, 24, 26, and 28 is generally similar to that described for forming the lower corner construction, although as shown in FIG. 6, the cross-sectional form of the upper framing strips may be somewhat simplified in those assemblies such as aquariums wherein no top horizontal plate comparable to the bottom panel 2 of the assembly is required.

In assembling the elements to produce an aquarium, for example, the bottom framing elements 12, 14, 16, and 18 and their retaining keys 64 are assembled after which the lower reduced ends of the corner posts 20 are inserted into the space 32 between the corner portion 72 of the key and the outer side portion 49 of the bottom framing members. The webs 42 are then struck outward as shown at 76 in FIGS. 2 and 4 to secure the elements together. The top horizontal framing members are assembled on the upper reduced ends 30 of the corner posts in a similar way so that all of the framing members are rigidly secured together.

A suitable sealant, such as a silicone plastic composition, is inserted into the sealant cavity 58 between the web 42 and rib 52 on the lower side 38 of the framing lower member and is also applied to the upper surface of the glass supporting rib 44 and the adjacent inner surface of the web 42 above rib 44. Sealant is also filled into the space between the inwardly projecting webs 44a on each of the corner posts 20 and may be inserted into the downwardly facing channel 41 of the upper framing member. The upper edges of each of the glass panels are then moved upward into the downwardly facing channel 41 after which the lower portions of the glass panels are moved into vertical positions wherein the lower edges of the glass panels engage the sealant on the upper surface of rib 44 and the vertical edges of the panels similarly engaging ribs 44a on the corner posts 20 to which sealant has also been applied. Finally, the bottom panel or state member 2 is inserted into position to rest upon the ribs 52 and 54 and project above the lower edges of the glass panels so as to hold them firmly in place against the inner faces of the webs 42 above ribs 44.

The amount of the sealant used is preferably in excess of that required to fill the cavity 58 so as to be sure that a complete seal is established throughout the edges of the side and bottom panels. In a similar way excess sealant may be applied between webs 44a on the corner posts 20. The glass panels and base 2 are of course pressed forcibly into place and as a result excess sealant tends to be squeezed out of the cavity 58 and over the adjacent surfaces of the panels when they are placed in position. However, in the present construction such excess sealant does not flow outward onto exposed surfaces of the panels but is instead retained within the excess sealant cavity 60 between the ribs 52 and 54 and the excess sealant cavity 62 between the outer face of web 42 and the inner face of the outer side 40 of the framing member. Excess sealant applied between the webs 44a on the corner posts is similarly confined between the webs 44a and side flanges of the corner posts and in the space in the corner of the posts between the webs 44a whereby the vertical edges of the glass panels are effectively sealed. It is therefore possible to apply ample sealant about the edges of the glass panels without danger of it spreading over the exposed surfaces thereof. The usual and time consuming clean up operation heretofore required after sealing of such panels is therefore eliminated.

In some constructions, if desired, a three armed key such as that shown at 78 in FIGS. 6 and 7 may be employed to provide a further and even stronger corner construction and to establish a more positive connection between the key 78 and the corner post 20. The vertically extending arm 80 of the key then may be provided with cut-outs 82 to receive stakes or outwardly struck portions of the webs 44a of the corner posts similar to the stakes 76 shown in FIG. 2.

Those aquariums, show cases or other structures embodying the present invention, which are relatively long or subjected to heavy loads, may be provided with strengthening bars intermediate the ends thereof as indicated at 90 in FIG. 1. For this purpose notches may be formed in the ribs 52 and 54 and the strengthening bar 90 may be provided with a T-shaped extension 92 to fit into such notches as shown in FIG. 8 to prevent spreading or distortion of the lower framing members under load.

In some assemblies embodying the present invention there may not be any panel members required, or a panel may be applied in such a way as to project beyond the corner of the assembly. Thus, as shown in FIGS. 9, 10, and 11 of the drawings the invention may be employed in the construction of a table or the like.

As shown in FIGS. 9, 10, and 11, the leg 100 of the table is formed of an extruded member having an angular cross-section as shown in FIG. 10 presenting side portions 102 and 104 terminating in inwardly turned extremities 106. The horizontal members 108 of the corner assembly may then have a vertical cross section as shown in FIG. 11 and be mitered at their adjacent ends to form the vertical corner 110. The horizontal members 108 are extruded lengths of material having an outer side wall 112, an inwardly extending top wall 114, and an inwardly extending bottom wall 116. The top wall 114 of the horizontal member 108 is provided with a downwardly projecting rib or web 118 whereas the inner edge of the bottom wall 116 is turned upwardly to present a flange 120. The webs 118 and flanges 120 combine with the outer side walls 112 of the horizontal members to present a key receiving cavity 122 adjacent the corner of the assembly.

A key 124 is received within the corner cavity 122 and as shown in FIG. 10 is formed with corrugated arms 126 extending at right angles to each other and frictionally engaging the inner surface of side wall 112, web 118 and flange 120 of each of the horizontal members 108. The corner portion 128 of key 124 is spaced from the side walls 112 of the mitered ends of the horizontal members 108 so as to leave a space 130 at the corner of the assembly into which the upper end of the leg 100 may be inserted. The corner portion 128 further is provided with retaining means 132 which as shown is formed with a generally T-shaped head having portions 134 projecting in opposite directions so as to embrace the inwardly turned extremities 106 on the side portions 102 and 104 of the leg 100. The top wall 114 of the horizontal members 108 is preferably removed adjacent the abutting ends thereof and pins or wedges 136 are forced downward into the space between the projections 134 on the key 124 and the intumed extremities 106 on the sides of the leg 100 to lock the members rigidly together. It is further desirable to deform the flange 120 of the horizontal members as shown at 138 so that it projects into one or more of the corrugations of the arms 126 of the key to lock the key to the members 108 and further strengthen the assembly.

A table top 140 may be secured to the assembly by means of screws 142 or the like passing through holes in the portion 144 of the top wall 114 of the horizontal members which extends inward beyond web 118 of the members 108. The top 140 may project outward beyond the corner assembly of the framing members as shown or it may terminate adjacent the outer sides of the horizontal members 108 since the construction provided presents a neat and attractive appearance affording a final structure requiring no further trimming or finishing operations.

While the constructions shown and described have framing members positioned at right angles to each other, the members employed in some assemblies such as certain show cases, receptacle and the like may be inclined at other angles presenting corner assemblies wherein members lying in three intersecting planes are connected together. It will also be apparent that the use of panels, sheet material, sealant, etc. are not required in many constructions and the panel members when used may be slidably moved into and out of operative or assembled relation.

In each of the forms of the invention shown and described the assembly utilizes framing strips which can be readily formed as aluminum extrusions although in some instances rolled or plastic strips may be used. The provision of mitered corners adds greatly to the attractiveness of the assembly and as a result a neat, strong, construction of improved and pleasing appearance is provided.

I claim:

1. A corner assembly including three elongated frame members, comprising:

two of said frame members having abutting mitered ends, formed to receive a key;

said key presenting an arm for engagement within spaced, generally parallel portions of an abutting end of each of said two frame members;

said key being formed to cooperate with portions of said abutting ends to define an angular cavity, opening generally transversely of the longitudinal extension of said two of said elongated frame members;

said last mentioned cavity being operable to receive an abutting end of the third of said three elongated frame members; and

said key being formed to cooperate with said abutting ends of said three frame members to frictionally, simultaneously engage all three of said elongated frame members, whereby said three elongated frame members are held firmly together.

2. A corner assembly, as defined in claim 1, wherein:

said key presents arms extending longitudinally of at least two of said members, the arms of said key being of an undulating configuration so as to present a series of recesses and crests; and

at least one of said three elongated frame members being at least partially formed with a surface corresponding with that of the key to frictionally engage therewith, to secure said frame member and key together.

3. A corner assembly, as defined in claim 1, wherein: each of said frame members consists of a strip of extruded material having an angular cross section.

4. A corner assembly, as defined in claim 1, wherein: said key presents three arms extending at angles to each other.

5. A corner assembly, according to claim 3, wherein: each of said frame members is formed with at least one flange;

each said flange being inclined inwardly when the corner assembly is properly constructed with pairs of said flanges in overlapping end relationship; and the end of one flange, of each pair of said flanges, being bevel cut to form said overlapping end relationship.

6. A structure having bottom and side walls, in the form of panels:

at least a portion of said side walls being formed of transparent material;

said bottom and side walls being secured together by frame members extending along the adjacent edges of said bottom and side walls;

each of said frame members comprising side portions disposed at right angles with respect to each other;

at least one of said side portions being provided with a panel supporting web projecting inwardly and extending generally parallel with respect to the other of said sides; said panel supporting web cooperating with at least one of said panels to define a substantially enclosed main, sealant cavity;

an excess sealant receiving cavity being disposed immediately adjacent said main sealant cavity; and said excess sealant cavity being substantially enclosed and partitioned from said main sealant cavity by at least one of said panel supporting webs.

7. A construction according to claim 6, wherein:

said substantially enclosed excess sealant cavity is at least partially defined by one of said panels.

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