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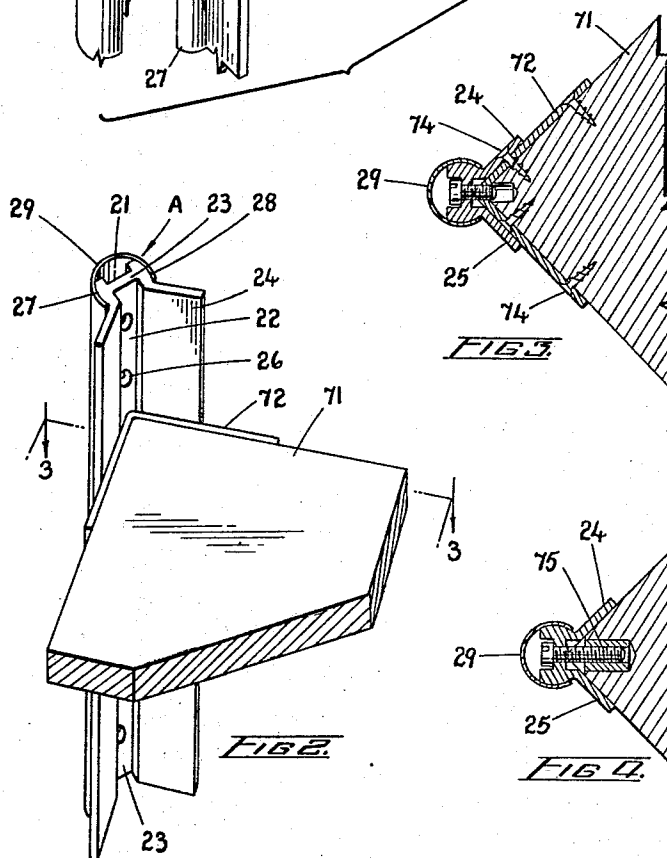
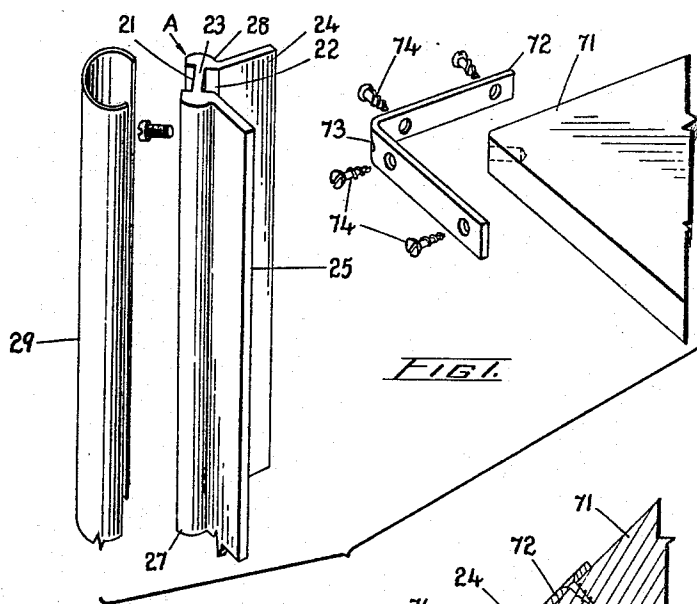
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3,276,832

PREFABRICATED SECTIONAL STRUCTURE

Filed Oct. 23, 1963

5 Sheets-Sheet 1



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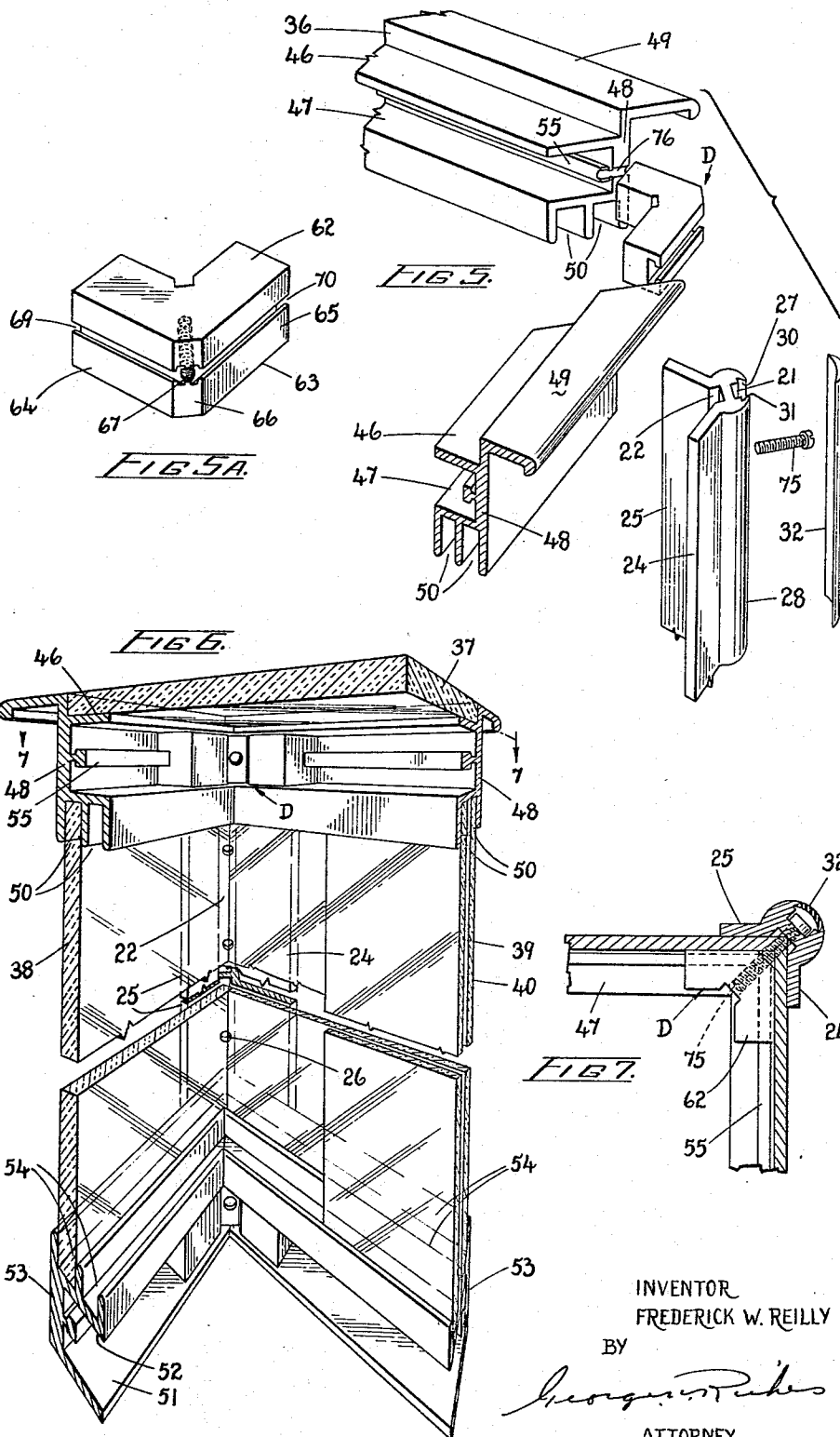
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3,276,832

PREFABRICATED SECTIONAL STRUCTURE

Filed Oct. 23, 1963

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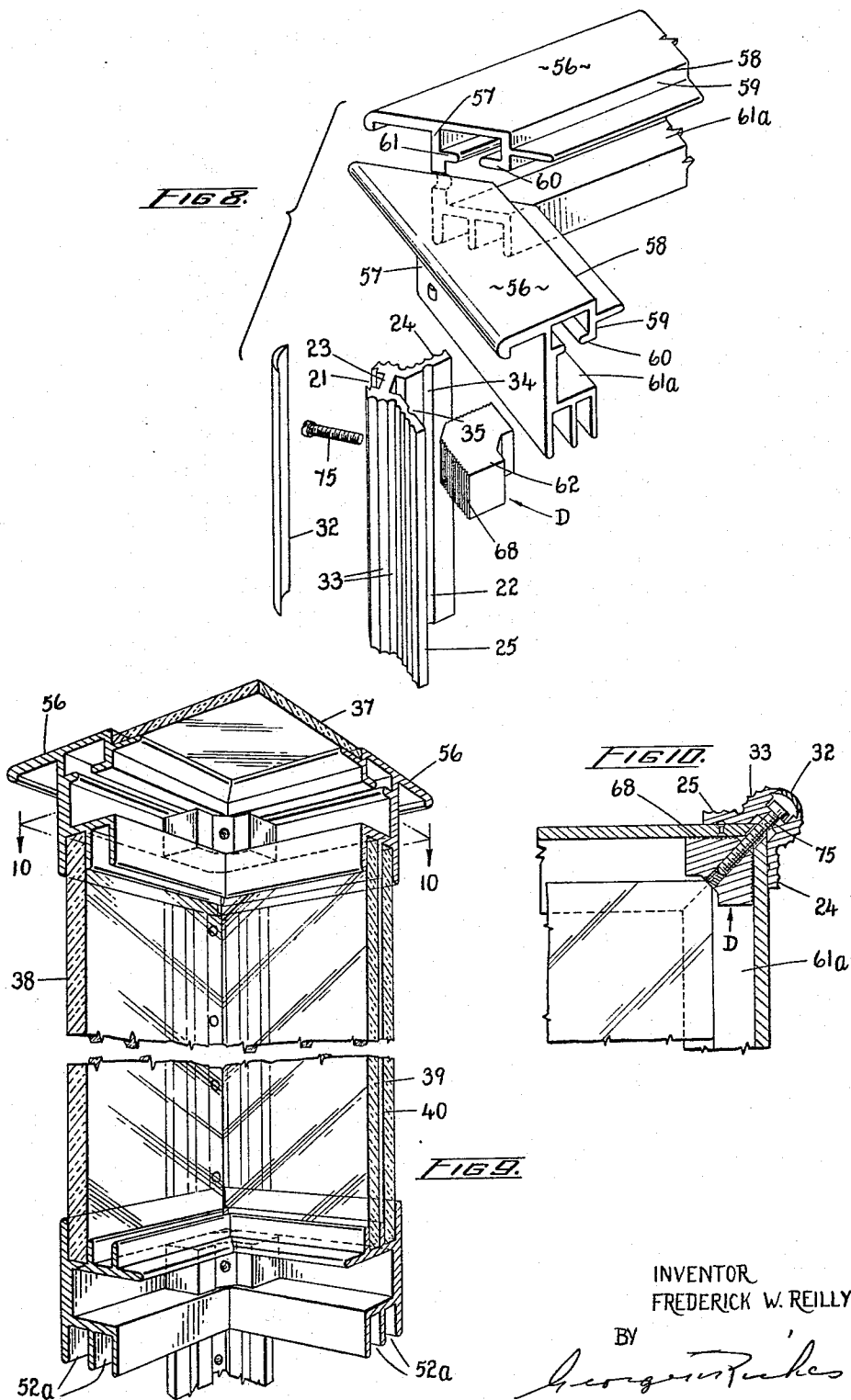
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PREFABRICATED SECTIONAL STRUCTURE

Filed Oct. 23, 1963

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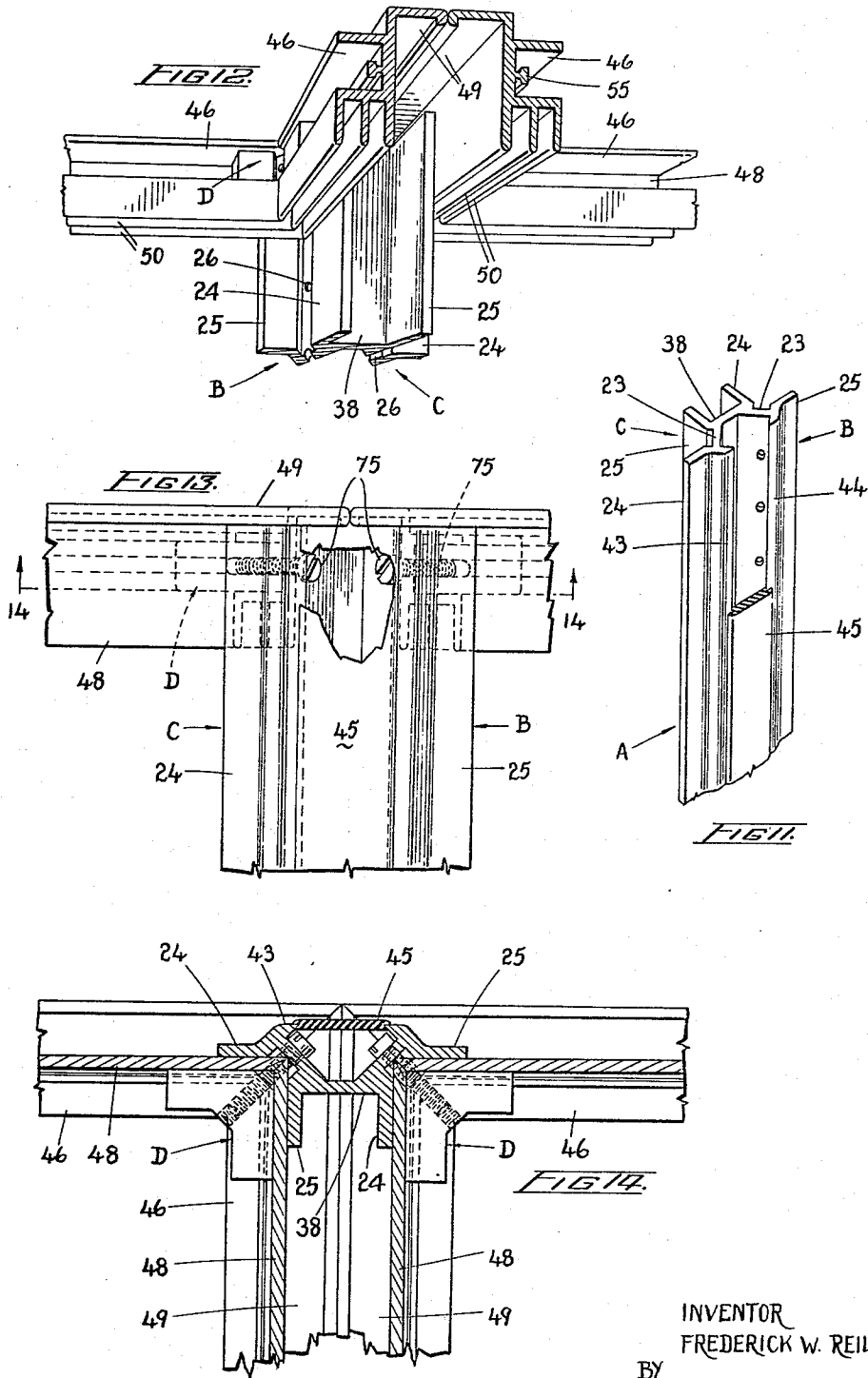
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3,276,832

PREFABRICATED SECTIONAL STRUCTURE

Filed Oct. 23, 1963

5 Sheets-Sheet 4



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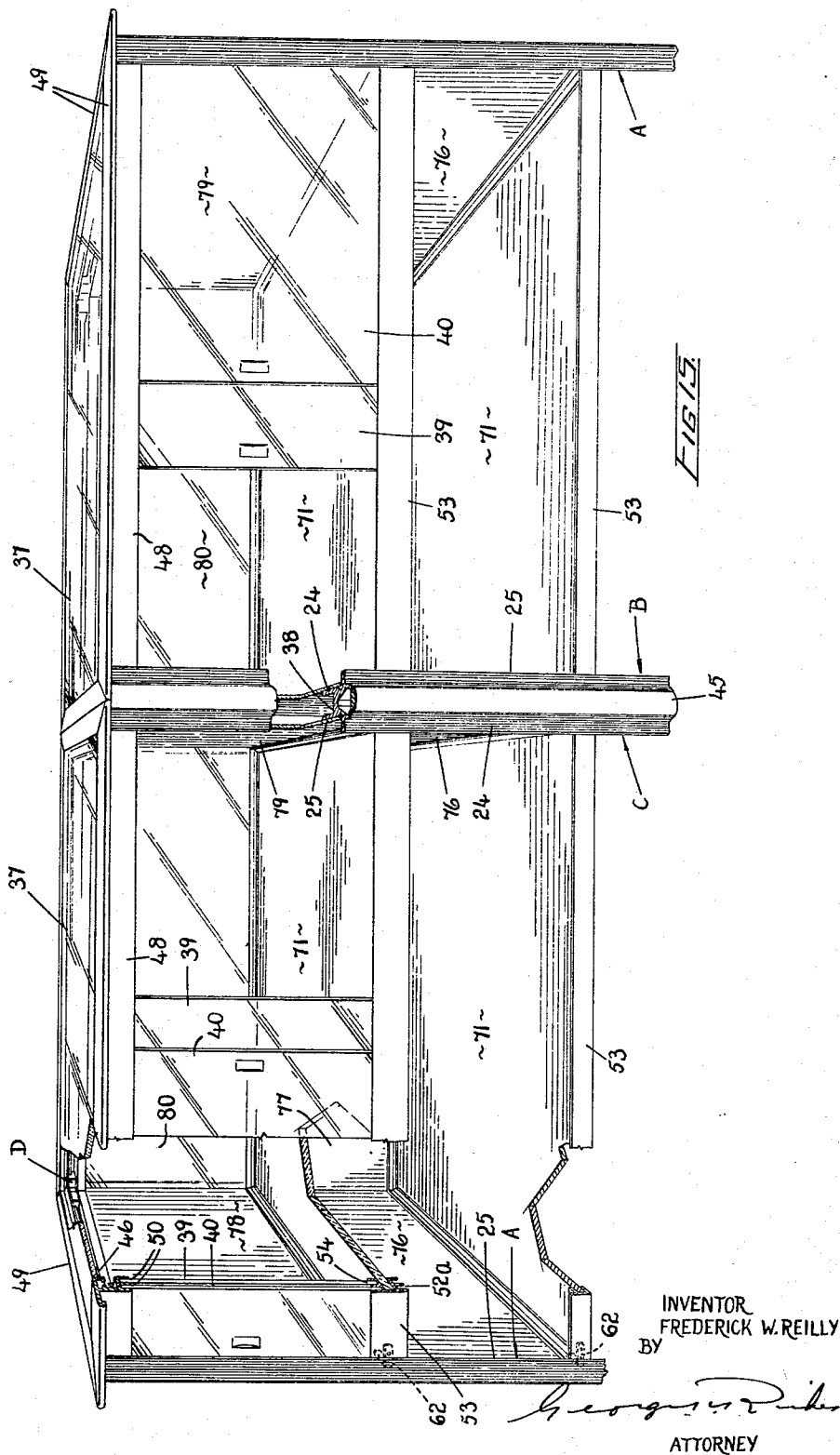
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PREFABRICATED SECTIONAL STRUCTURE

Filed Oct. 23, 1963

5 Sheets-Sheet 5



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3,276,832

PREFABRICATED SECTIONAL STRUCTURE
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Filed Oct. 23, 1963, Ser. No. 318,363
5 Claims. (Cl. 312—140)

This invention relates to a prefabricated sectional structural system enabling the speedy erection and dismantling of frameworks for fixtures, e.g., display units and front store equipment and in particular to a novel post construction and a novel framework construction which makes such speedy erection and dismantling practical for erection in a new location on a low cost basis.

In this specification the term "fixture" means tables, counters, showcases, shelving and the like used in stores, offices, etc.

In the field of front store fixtures, e.g., merchandise display, it is important for the successful display of merchandise that such display fixtures, be attractive to gain the attention of prospective customers. In addition, they must be constructed in a manner to permit the sales personnel having easy access thereto for removing the goods therefrom to allow prospective customers to have closer inspection of the same as and when necessary. In addition, the fixtures must be provided with means for securing them against unauthorized access.

A further need is to construct the fixtures in a manner that they will blend with the general decor of the premises in which the same are located.

The present practice used in the manufacture of front store fixtures is to have them designed by architects or other skilled personnel and to construct each fixture on the site by skilled craftsmen such as carpenters, etc., from wood and veneers and glass. Such a method results in high costs because the material has to be cut by hand and erected on the site. This is a long and tedious job and delays the opening of the premises for a substantially long time.

Another of the present practices, is for display contractors to erect the showcases in their own establishments in accordance with the plans provided by the owner of the premises. Such a practice does provide some economy in connection with the cost of construction. However, this does involve high transportation costs since the shipping of finished furniture involves packaging problems and also damage in transit and handling.

It is an object of the present invention, to provide a structural unit which can be mass-produced at a low cost and which can either be cut into the prescribed lengths before shipment to the site of erection or can be shipped to the destination in unit lengths which can be cut at the site and then erected. It is preferable that the parts be cut into the prescribed lengths and then shipped to the site of erection in a knocked down condition. In that case, the structural elements can be assembled into a completed showcase with precision and rapidity to provide a rigid fixture, e.g., a showcase with a counter top. In such an assembly method, it is not necessary to use skilled labor but unskilled labor can be employed using elementary tools such as a screwdriver and a hacksaw and possibly files for trimming where necessary.

A further object and advantage of the present invention is that the several structural elements are machine made with precision and accuracy which ensures absolute squareness when the elements are assembled and the members tightened together as hereinafter described in detail.

The basic element of the structural members is a novel post or column characterized by a cross-section, which has substantially the structural form shown in the accompanying drawings having an outwardly (downwardly) facing channel which is shaped to have attached thereto a finish-

2

ing cover and an inwardly (upwardly) facing channel which has the outer reaches of its sides forming approximately a right angle to each other and at an angle of about 45° to the common wall separating the two channels, the common wall being holed at uniform modulus. The inwardly facing channel is arranged to receive the ends of beams and the corners of hardboard, glass or steel shelves. In the case of hardboard, glass or steel shelves, this does away with the cutting of corners, an expensive and time consuming operation.

The column or post is preferably made of aluminum since it can be mass-produced with precision, in the desired cross-section by extrusion. Therefore, the description will have reference to the use of that material, although other materials may be used without departing from the substance of the invention.

When the post of this invention is used in combination with shelving, the same can be connected together by means of screws entered through the holes in the common wall and into the corner of the shelf. However, as will be explained later, it is preferable to apply a metal L-corner plate around the shelf corner and then clamp the L-corner plate into the angle of the post by means of a machine screw which is threaded into a threaded hole formed through the angle of the corner of the plate.

When the structure, e.g., a glass showcase, comprises posts, and horizontal beams, forming the framing of the structure, corner plates or connectors of novel construction and beams of novel cross-section configuration are employed as will be more fully described. However, the shape of the corner blocks will depend on the beam construction and may be modified to adapt it to particular needs. However, as contemplated by the present invention, for beam structures of the form to be described herein, the corner blocks or connectors have substantially the cross-section illustrated in the drawings although they may be modified in cross-section if desired, without departing from the substance of the invention.

The beams may be made in a variety of designs depending on the particular application. These, too, are made by extruding the aluminum through a die of the desired shape. One of the simplest beams suitable for completing the frame of the structure is one having a base with spaced apart upright walls forming a channel for receiving the connector block above referred to, wherein a connector channel is formed for receiving the connector with sufficient clearance to provide a good fit as hereinafter described.

The foregoing is a brief outline of the general nature of the invention and its novel features.

For the purpose of illustrating the construction and use of the present invention, it will now be described in conjunction with the exemplifications of the same shown in the appended drawings which is a showcase having a glass front, sides and counter top. Of course, it is to be understood that this is being done for the purpose of illustrating the invention. It will be apparent that the same can be modified by those skilled in this field without departing from the substance of the same.

In the drawings:

FIGURE 1 is an exploded view illustrating the post of the present invention used in combination with a shelf which is to be connected to the post by the connecting block;

FIGURE 2 shows the elements of FIGURE 1 in an assembled state;

FIGURE 3 is a cross-section on the line 3—3 of FIGURE 2;

FIGURE 4 illustrates an alternative means of connecting the post and shelf;

FIGURE 5 is an exploded fragmentary view illustrating the novel combination of the post of this invention

and framing members (beams) for constructing a showcase and the novel connector block for connecting the beams and the posts to form a rigid unitary framework;

FIGURE 5A is an enlarged view of the connector block shown in FIGURE 5;

FIGURE 6 shows the elements of FIGURE 5 in an assembled state;

FIGURE 7 is a cross-section on the line 7—7 of FIGURE 6;

FIGURE 8 is an exploded fragmentary view illustrating an alternative construction of the elements shown in FIGURES 5, 6 and 7;

FIGURE 9 is an assembled fragmentary view showing the top beams of FIGURE 8 for sliding doors with middle beams for sliding doors used in constructing a showcase;

FIGURE 10 is a cross-section on the line 10—10 of FIGURE 9;

FIGURE 11 illustrates a pair of posts of the present invention joined together in a novel manner for use in a centre post when two units are to be butted together to form a substantially long showcase or counter;

FIGURE 12 is a perspective fragmentary view showing the post of FIGURE 11 connecting a pair of upper or top longitudinal beams of two abutting units to their respective transverse upper or top beams;

FIGURE 13 is a front elevational view of the structure illustrated in FIGURE 12;

FIGURE 14 is a cross-section on the line 14—14 of FIGURE 13; and

FIGURE 15 illustrates a showcase made in two sections to illustrate the use of the several elements of the invention in a pair of showcases joined end-to-end, looking into it from the rear.

Throughout the specification the same reference numerals are used to refer to the same parts in the several figures.

Post construction

FIGURES 1, 2 and 3 illustrate a simple form of post construction generally indicated by the letter A. The post which is substantially rigid comprises an I channel defined by an outwardly opening channel 21 and an inwardly opening channel 22 having a common base or wall 23 separating the two channels. The parallel walls forming the channel 22 are extended to form a pair of lateral extensions or wings 24, 25 the wings forming substantially a right angle and being substantially at an angle of 45° to the common base 23. The common wall 23 is holed as indicated at 26 at the desired modulus. A modular system of 1½" is satisfactory since a ¾" corner plate fits into that system and whilst ¾" is a much desired minimum for beams on small display showcases, the same ¾" is adequate with beams up to 2" deep on long spans. The outer surfaces of the I channel are convex throughout their length as indicated at 27, 28 and are engaged by an arcuately shaped resilient cover 29 when placed in position as illustrated in FIGURES 2, 3 and 4. When the cover 29 is applied over the channel 21, it conceals the channel and the screws employed in assembling the showcase, thus giving the same a finished appearance.

FIGURES 5, 6 and 7 illustrate a post construction which is slightly modified from the one shown in FIGURES 1, 2, 3 and 4. The post construction of FIGURES 5, 6 and 7 is essentially the same as the one shown in the preceding figures. The main difference lies in the manner in which the cover is attached to the outwardly opening channel 21. It will be seen by reference to FIGURE 5 that channel 21 is formed with grooves 30, 31 along each wall adjacent the lips of said wall to form a dovetail channel to receive and retain therein the lateral edges of a longitudinal strip cover at 32 which serves the same purpose as the resilient arcuate cover 29 but leaves the exterior circular faces 27, 28 exposed. The cover 32 is made of flexible resilient material so that it can preferably be sprung into the grooves 30, 31 or slide into the same

as desired. The cover may be made of any resilient material such as plastic, light aluminum, etc.

Another modification of the post shown in the preceding drawing is illustrated in FIGURES 8, 9 and 10. The post shown in FIGURES 8, 9 and 10 is essentially the same as the one shown in FIGURES 5, 6 and 7 insofar as the essential elements are concerned. The outer surface of the post shown in FIGURE 8, has been formed with longitudinally extending flutes as indicated by the reference numeral 33 which gives the post additional strength without materially increasing its mass. The fluting also enhances the beauty of the exterior surface of the post. In addition, the interior faces of each of the wings 24, 25 may be provided with one or more longitudinal flutes 34, 35 respectively, the flutes 34, 35 being equidistant from the bottom of the channel 22.

In a normal showcase, the length is somewhere from 4 to 8 feet, and four of the posts hereinbefore described are used, one at each corner, in assembling such a showcase. However, when several such showcases are to be lined up as a counter in a straight line it may be desirable to join the counters together to give the appearance of one continuous counter or showcase. For such purpose a pair of the posts hereinbefore described have been joined together, siamese fashion, by a common web, as illustrated in FIGURES 11, 12, 13 and 14.

Such a post is illustrated in FIGURES 11 to 14 and may comprise a pair of posts similar to the one shown in FIGURES 1, 5 or 8 which pair has been indicated by the letters B, C, joined together by a web 38 with the result that wing 24 of post B and wing 25 of post C extend rearwardly at right angles to web 38, and the wing 25 of post B and wing 24 of post C are extended outwardly from the post at right angles to the wings 24, 25 respectively so that they are substantially coplanar. With this configuration, it will be seen that a channel similar to the channel 22 is formed by the web 38, diverging wall 23 of post B, diverging wall 23 of post C and the inwardly projecting extensions 43, 44 respectively which project towards each other and cooperate forming a pair of lips to engage and retain the flexible cover 45 (FIGURE 14) in place, the cover being similar to and performing the same function as the cover 32.

Beam construction

The beam construction or properly speaking, the cross-members for the structure can be produced in various forms depending on the particular application. For a simple showcase four upright posts similar to those of FIGURE 1 or 5 and a few cross-members or beams for the top and lower beams will afford a very useful unit of simple construction. For the purpose of illustrating the construction and form of the beams, a relatively simple form of the same has been illustrated in FIGURES 5, 6 and 7. In FIGURE 5, the beams employed or used around the top of the showcase are made from extruded aluminum and have an inwardly opening U-channel defined by upper and lower horizontal channel walls 46, 47 and an upright base wall 48. Every beam irrespective of its other features embodies this channel which is dimensioned to receive therein a corner plate or connector to be hereinafter described. This channel is hereinafter referred to as the connector channel. It will be seen on reference to FIGURE 5 that the base wall 48 in the instant illustration is extended as indicated at 36 slightly above the wall 46 and is formed with an outwardly extending extension 49, the outer edge of which is rolled downwardly to give a finished appearance. The upper surface of the wall 46 provides a support for a counter-top 37 which may be made of glass, plywood or other suitable material, the depth of the extension 36 being adjusted so that the top surface of the counter will be flush with the top surface of the extension 49. The outer edge of the extension 49 being rolled down to give a finished appearance. The under surface of the wall 47 carries one or more channels

50 which serve as tracks for such purposes as will be hereinafter described.

When the subject matter of this invention is to be used for the assembly of a showcase, the U-channel previously described can be adapted for use as a cross-member or beam from the bottom sill of the same. In FIGURE 6, a modification of the U-channel has been illustrated and it will be seen that the U-channel is defined by the spaced apart horizontal channel walls 51, 52 and the upright wall 53 which forms the front of the beam, the walls 51, 52 and 53 combining to form the connector channel. The upper surface of the channel wall 52 is formed with one or more upwardly facing tracks 54 which cooperate and complement the tracks 50. The tracks 54 are about 1/2 the depth of the tracks 50. To add to the rigidity of the connection between the beams and the posts, the inside face of the base wall 48 may be formed with an upstanding projecting rib which forms a key 55, the purpose of which will be described later. This construction of the tracks permits the glass fronts 38 or sliding doors to be mounted in place after assembly has been completed or a pair of sliding doors 39, 40 each being 1/2 the length of the showcase.

In FIGURES 8, 9 and 10 the beam construction illustrated therein is a modification of the beam construction previously described. The beam structure which is to be used for the top frame members includes the top wall 56 from which is suspended centrally therefrom a base or front wall 57. The inside edge 58 of the top wall 56 is formed with a skirt 59 the bottom edge of which is turned inwardly as indicated at 60 which is substantially coplanar with a rib 61 carried on the inside surface of the wall 57 and extending towards the same. The intumed edge 60 and the rib 61 combine to form one of the walls of the connector channel hereinbefore described. The other wall of the U-channel is defined by the horizontal wall 61a carried by the base wall 57 and spaced from the projection 60 and rib 61 to form the connector channel for a connector member to be hereinafter described.

In FIGURE 9, the beam illustrated in the bottom portion of that figure is similar to the beam member shown in FIGURE 6, but it has been modified to include a set of tracks on the underside of the channel wall 52 the tracks being indicated by the numeral 52a which tracks are substantially the same depth as the tracks 50.

It is to be noted that the rib 55 shown in FIGURES 5 and 6 has been omitted from the connector channel shown in FIGURES 8 and 9 since it is not an essential element.

Corner block

The corner block or connector which is used for connecting the legs to the beams or cross-members is illustrated in FIGURES 5 to 14 inclusive and consists of a small extruded piece generally indicated by the reference letter D (FIGURE 5). In plan, it has the general appearance of a truncated angle (i.e., with the vertex removed) and dimensioned so that it will fit snugly into the connector channel of the beams. The construction of the corner block D is shown in detail in FIGURE 5A and it consists of upper and lower parallel flat faces 62, 63 cheeks 64, 65 and a nose 66. The thickness of the corner block is determined by the width of the connector channel so that the corner block D will fit therein with a substantially close fit which precludes wobbling in any plane as hereinafter described. The cheeks 64, 65 are at an angle of approximately 45° to the nose 66 and at about 90° to each other. A threaded screw hole 67 is formed centrally through the corner block substantially perpendicular to the same so as to bisect the angle between the cheeks. It will be also observed that the corner block is dimensioned so that it will fit into the angle of the wings, e.g., wings 24, 25 (FIGURE 1) or 34, 33 (FIGURE 8).

In addition, as shown in FIGURE 8, the corner block D may have the cheeks 64, 65 formed with vertical serrations 68 to increase the bite when in assembled state.

For use with cross-members which are provided with a key 55, the cheeks 64, 65 are provided with horizontal channels 69, 70 to receive keys 55 with a sliding fit.

Assembly of the structure into a unit

FIGURES 1, 2, 3 and 4 illustrate the use of the posts in a shelf structure. The corner of a shelf which consists of a sheet of plywood is indicated by the reference numeral 71 to which is applied an L-corner plate 72 formed with a threaded hole 73 in the angle thereof, the corner plate being attached to the corner of the shelf by means of screws 74. The plywood must of course have sufficient thickness not to have any sag when supported by its edges under normal loading in a showcase. The post A is attached to the corner of the shelf by inserting the angle of the corner plate 72 between the wings 24, 25 with the holes 73 in registration with the appropriate hole 26 and driving the screw home into the hole 73 by means of a screw driver. When the four corners of a series of shelves have been so connected or attached to the upright posts, a rigid structure is obtained substantially free from wobble.

FIGURE 15 illustrates a series of store fixtures, e.g., a showcase linked together by means of, for example, the single post A and the combination of posts A (FIGURE 11). In FIGURE 15 the outside corners of the showcase, that is, the extreme ends, the beams are linked together showcases employing the upright posts A illustrated in FIGURES 1 to 10 inclusive and inner corners are interconnected by the post of FIGURE 11. To avoid unnecessary repetition, the assembly of the showcase illustrated in FIGURE 15 will be described with reference to the exemplification illustrated in FIGURES 5 to 7 inclusive and 11 to 14. The first step of course is to determine the dimensions of each of the showcases and, when that has been done, cut the beams into the desired lengths preferably mitering each end as illustrated and forming a half hole 76 in each mitered end, the two half holes in abutting mitered ends forming a hole through which the screw 75 will enter when assembling the showcase. Having obtained the necessary number of beams such as those as has been previously described in conjunction with FIGURE 8 and either the lower beams illustrated in FIGURE 6 or 9 depending on the type of the showcase the assembly of the case can be commenced. To reduce the number of cross-sections of beams the middle beam shown in FIGURE 9 can be used for the bottom beam in which case the bottom pair of tracks will not be used.

For the purpose of the present illustration, one method of assembling the elements illustrated in FIGURES 5 to 7 to form a case such as is illustrated in FIGURE 15, will now be described. The first step in the assembly operation is to loosely attach the connector blocks D in the angle between the wings 24, 25 on the four outside corner posts A, B or C, as the case may be, which will be used at the ends of the showcases as shown in FIGURE 15. The number and spacing of the connector blocks on each post will be determined by the number of horizontal shelves of the finished cases.

In the present illustration, three corner blocks will be required on each corner post A (four in number) and six corner blocks on the composite post B, C.

When these preliminary steps have been finished the beams can be connected to the posts. The most convenient way would be to assemble the lowermost shelves 71 with the corner blocks 62 attached with beams 53 fitted over the edges as shown are brought into position into the angle of the posts as illustrated in FIGURES 1 and 2, but before tightening the screw, front and side panels 76, 77 are set in position with their edges in channels 54 of the beams 53 as illustrated. It will be seen that as shown in FIGURES 5 and 6, the mitered ends of a pair of upper beams are brought together at an angle of 90° and in doing so the connector block slides into the connector channel formed by the walls 46, 47, the key 55 being re-

ceived in the channel or grooves 69, 70, respectively. The same sequence is carried out for assembling the upper shelves 71, middle beams 53 (FIGURE 9) front panels 80 and side panels 78, 79. The top beams are then placed in position with the top edge of the panels in their respective grooves. When all of the fixed elements are in assembled position the screws 75 are then tightened. The sliding doors 39, 40 are then placed in position by inserting the top edges in their respective channels 50, and the bottom edges in their respective channels 54, which are $\frac{1}{2}$ the depth of channels 50. The counter top can be placed on and supported by the channel walls 46 of the top beams and the floor of the showcase can be supported appropriately by the lower frame member. When the assembly is finished the vinyl strip 32 is applied as shown to completely cover and conceal the screws which are used to connect the several parts together.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. In a knockdown case having upper and lower horizontal frame members removably connected to and supported by at least four upright corner posts to form a unitary substantially rigid structure which can be completely assembled from the exterior of the case, a joining system by which the horizontal members have each corner rigidly and removably connected to its adjacent supporting post characterized by each upright post comprising an elongated body having an outwardly facing front face and an inwardly facing longitudinal channel of V-shaped cross-section, said body having a plurality of modular spaced holes extending horizontally and centrally through the body in registration with the V-shaped channel which has its vertex located on the longitudinal center line of the body and having its sides at an angle of about 45° to said front face and about 90° to each other, a plurality of corner blocks, each corner block having an exterior face defined by side walls disposed at an angle of substantially 90° to each other and opposing said longitudinal channel whereby said corner blocks conformably seat in said V-shaped channel, means securing each corner block to an associated one of said horizontal frame members, each corner block having a threaded orifice arranged in a plane for registration with one of said holes, a screw entered through a selected one of said holes from the exterior of each post at the respective corner into the threaded orifice of the contiguous corner block whereby on tightening the said screw the horizontal frame members are secured, in a fixed position, to the post, and the threaded engagement between the screws and the threaded orifices in the corner blocks defining the sole means for securing said horizontal frame members and corner posts to each other at the corners thereof.

2. In a knockdown case according to claim 1, the additional element of a resilient channel-like closure member extending the full length of each post and complementary fastening means carried by the closure member and the exterior of the post removably securing the said closure in place over said face to conceal the screw heads.

3. In a knockdown case according to claim 1 in which the corner block is a separate element and the upper and lower horizontal frame members comprise channel members having flat exterior faces which engage against the V-channel of the respective posts and having abutting

mitered ends fitted in the angle of their respective posts, the said mitered ends being compressively clamped between said corner block and the V-shaped channel.

4. In a knockdown case according to claim 3, the additional element of a resilient channel-like closure member extending the full length of each post and complementary fastening means carried by the closure member and the exterior of the post removably securing the said closure in place over said face to conceal the screw heads.

5. In a knockdown case having upper and lower horizontal frame members removably connected to and supported by at least four upright corner posts to form a unitary substantially rigid structure which can be completely assembled from the exterior of the case, a joining system by which the horizontal members have each corner rigidly and removably connected to its adjacent support post characterized by each upright post comprising an elongated body having an outwardly facing front face and an inwardly facing longitudinal channel of a V-shaped cross-section, said body having a plurality of modular spaced holes extending horizontally and centrally through the body in registration with the V-shaped channel which has its vertex located on the longitudinal center line of the body and having its sides at an angle of about 45° to said front face and about 90° to each other, a corner block conformably seated in each V-shaped channel, said corner block having a threaded orifice arranged in a plane for registration with one of said holes, a screw entered through a selected one of said holes from the exterior of each post at the respective corner into the threaded orifice of the contiguous corner block whereby on tightening the said screw the horizontal frame members are secured, in a fixed position, to the post, each corner block is a separate element and the upper and lower horizontal frame members comprise channel members having flat exterior faces which engage against the V-channel of the respective posts and have abutting mitered ends fitted in the angle of their respective posts, the said mitered ends being compressively clamped between said corner block and the V-shaped channel, and each horizontal frame is formed with a longitudinally extending key in each channel which registers with and fits into a conforming keyway formed in contiguous faces of the corner block.

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