May 27, 1969 A. R. GERIK 3,445,950

WARP-FREE FRAME MEMBERS AND FRAME ASSEMBLIES THEREOF

Filed June 27, 1967 Sheet 1 of 2

FIG. 1.

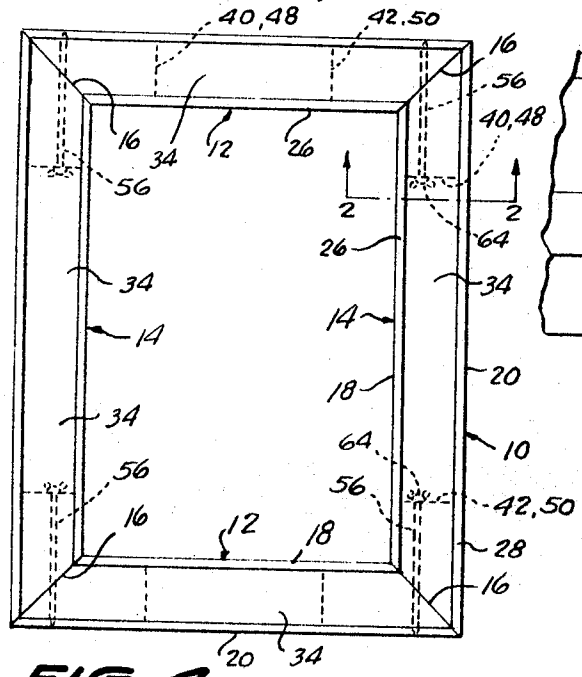



FIG. 2.

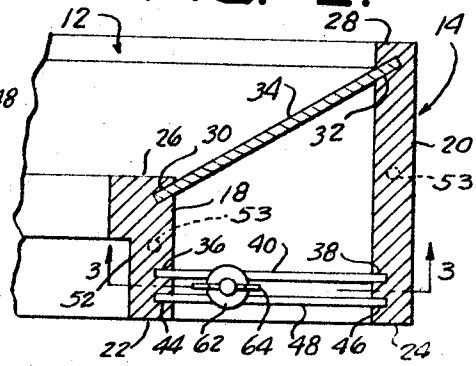



FIG. 3.

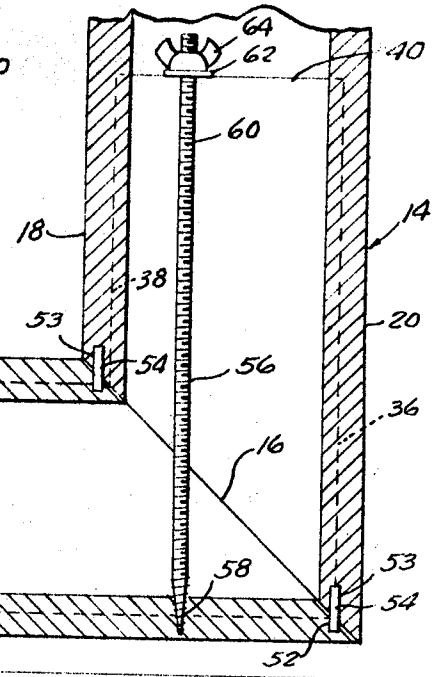



FIG. 4.

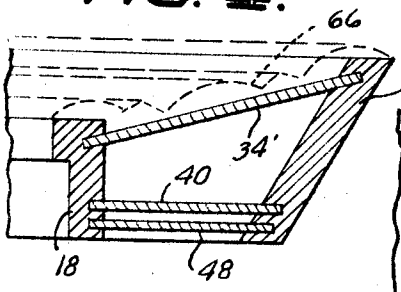



FIG. 5.

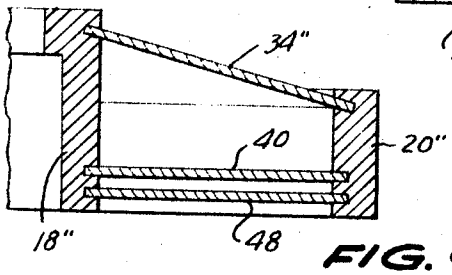
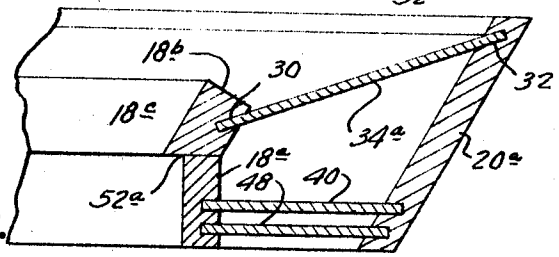



FIG. 6.




INVENTOR.
ALVIN R. GERIK,

BY
Berman, Davidson & Berman
ATTORNEYS.

May 27, 1969 A. R. GERIK 3,445,950

WARP-FREE FRAME MEMBERS AND FRAME ASSEMBLIES THEREOF

Filed June 27, 1967 Sheet 2 of 2

FIG. 7.

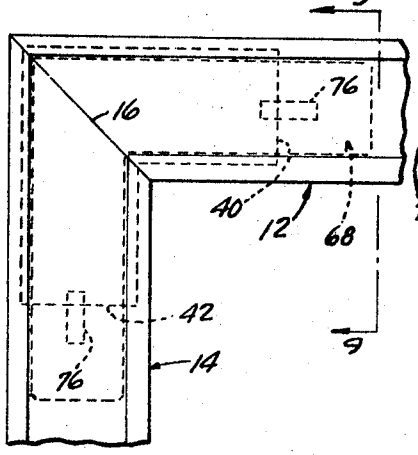



FIG. 8.

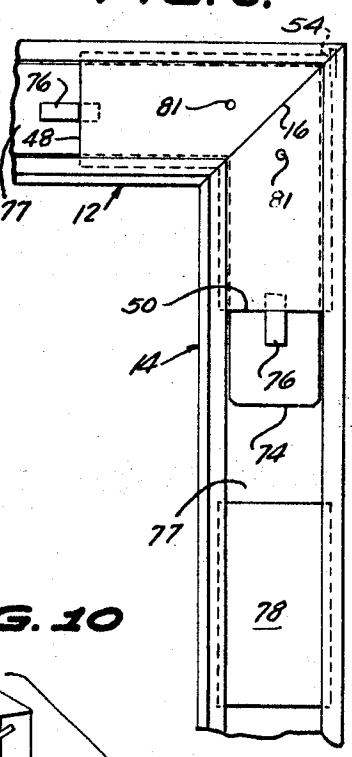



FIG. 9.

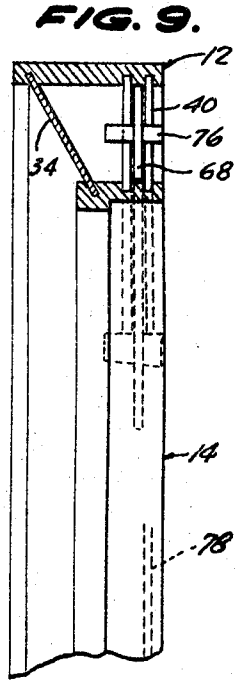
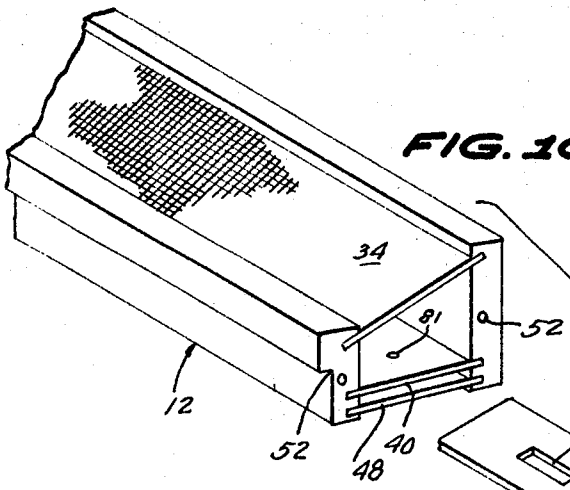



FIG. 10



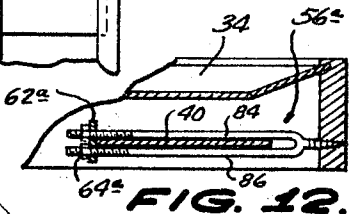
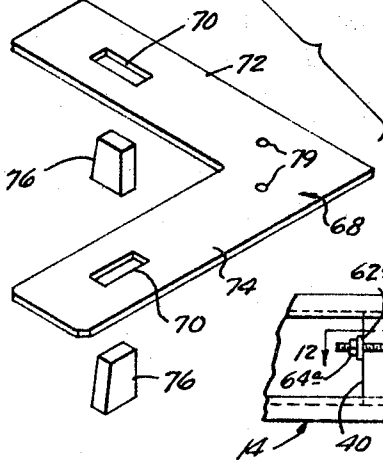
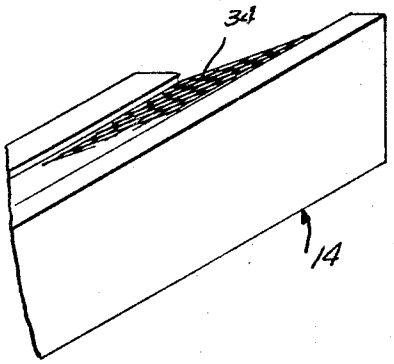
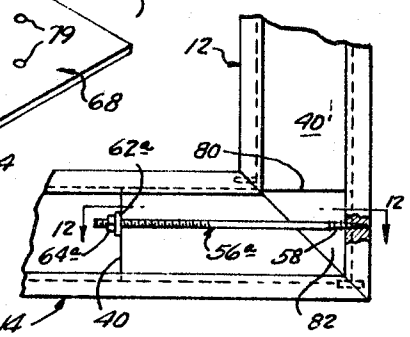




FIG. 12.

FIG. 11.




INVENTOR.
ALVIN R. GERIK,
BY
Berman, Davidson & Berman
ATTORNEYS.

United States Patent Office

3,445,950

Patented May 27, 1969



3,445,950

# WARP-FREE FRAME MEMBERS AND FRAME ASSEMBLIES THEREOF

Alvin R. Gerik, 531 E. 5th Ave.,
Anchorage, Alaska 99501

Filed June 27, 1967, Ser. No. 649,261
Int. Cl. G09f *1/12, 3/18*
U.S. Cl. 40—155 13 Claims

## ABSTRACT OF THE DISCLOSURE

A knock-down frame member of warp-free construction adapted to be assembled with similar members of selected lengths to provide a frame for pictures, posters, and the like, and comprising a pair of elongated side strips spaced apart and standing on edge with their lower and upper edges respectively parallel to one another, a pair of aligned grooves one on each said side strip near the upper edge and extending the full length thereof, a facing plate connecting said side strips with its edges adhesively secured in said pair of grooves, one or more additional pairs of aligned grooves in said side strips near their bottom edges and reinforcing plates connecting the side strips with their edges glued in said additional aligned pairs of grooves, said reinforcing plates being preferably placed in pairs at each end of the side strips, the ends of said side strips, facing plate, and preferably said reinforcing plates being beveled to enable miter joint assembly with similar frame members into a picture frame.

This invention relates to frame members, and more particularly to a knock-down frame member of warp-free construction adapted to be assembled with similar members of selected lengths to provide frames of any desired size suitable for framing pictures, posters, and the like.

Conventional frame moldings of different lengths and intricate configuration are available for purchases, but are quite expensive, and are subject to warpage so that after a relatively short period of use in a frame the distortion from warping necessitates discarding the frame. To overcome the problem of warpage, frame members have been manufactured by selection of suitably grained strips or piles, the laminations being bonded together under pressure with the grain of successive strips running in different directions. Such frame members are extremely expensive and still not entirely warp-free under all environmental conditions.

An additional problem in obtaining frame members for home assembly, is that the retailers are unable to carry an adequate supply of enough different sizes so that frames of any size can be assembled therefrom. Where the supplies are nearly adequate, as in cheaper frame members formed of lightweight metals or plastics, their appearance is unsatisfactory to persons of artistic temperament, and the lengths of the frame members cannot easily be modified by the retailer or by the purchaser, because of the material from which they are formed is not susceptible to easy cutting. Certainly, none of the conventional and available frame members can, after assembly into a picture frame and a period of use thereof, be disassembled, recut to reduce length, and reassembled to form another picture frame of different and smaller size.

To overcome the above disadvantages the present invention provides a frame member formed of inexpensive woods, or similar materials capable of being easily cut and without the use of laminations or plies. To entirely prevent warping, the frame member is formed of a plurality of strip-like elements and panels arranged in a



very strong box or tube-like structure from which one continuous wall is omitted and replaced by discontinuous reinforcing plates. The strips and panels being angled with respect to each other ensures that their grains and the resulting warping forces are disposed in different directions so that the force and tendency of one element to warp in one direction will counteract and prevent the warping of other elements in other directions. As a result, a very strong warp-free structure is provided and one which is susceptible to many variations in cross-sectional configuration, or design. Thus, the frame member can readily be designed to be artistically appealing. Being formed of wood, or wood-like materials, in its preferred form, the frame members may be easily cut to any length before or after assembly into a frame. Thus, the purchaser may, even after he has assembled a frame of one size, tear down the frame, cut two or more of the sides and assemble a second smaller frame from the original frame members.

It will be readily apparent, from the above brief description of the invention, that the primary object of the invention is to provide frame members which obviate the disadvantages of conventional and commercially available frame members.

Another object of the invention is to provide frame members of open box-like or tube-like construction which will have long life and will be free of warpage.

A further object of the invention is to provide frame members formed of inexpensive materials, which are of simple construction and easy to assemble into a frame.

Still another object of the invention is to provide frame members, having the above-described characteristics, which are subject to a variety of design configurations and which are appealing to artists and artistically inclined persons interested in framing pictures, or posters.

Yet another object of the invention is to provide frame members, having the above-described characteristics, which may be easily and quickly assembled or disassembled, may be shipped in disassembled condition in packages of minimum size and weight, may be stored in minimum space, and may be utilized interchangeably in any number of combinations to produce frames of different sizes and shapes.

A still further object of the invention is to provide frame members suitable for stocking by retailers in selected lengths for permitting assembly of a wide range of sizes of frames, while reducing the stock requirements of said manufacturer and distributor on the retail level; said selected lengths being such as to be easily cut to provide additional lengths for assembly of frames of different sizes.

Yet a further object of the invention is to provide frame members, of the above characteristics, having mitered ends which may be easily and quickly assembled and disassembled, and which, upon assembly, will form sturdy, compact, and inexpensive frames for pictures or advertising displays.

A still further object of the invention is to provide frame members, of the above characteristics, including corner coupling or securing means for connecting the adjacent mitered frame members and locking them together to immobilize the members and provide a tight joint at the miters.

Yet another object of the invention is to provide improved members, of the above-described characteristics, which are so constructed as to lend themselves to the addition of plaster facings for the achievement of any desired decorative design.

The novel features which are considered characteristic of the invention are set forth with particularity in the appended claims. The invention, itself, however, both as

to its objects and advantages thereof, will best be understood from the following description of specific embodiments when read in connection with the accompanying drawings, wherein like reference characters indicate like parts throughout the several figures and in which:

FIG. 1 is a front elevation of a picture frame assembled from members constructed according to the invention;

FIG. 2 is a cross-sectional view taken from line 2—2 in FIGURE 1, and looking in the direction of the arrows;

FIG. 3 is a cross-sectional view taken from line 3—3 of FIG. 2, and looking in the direction of the arrows;

FIGS. 4, 5 and 6 are cross-sectional views similar to FIG. 2, but of three modified embodiments;

FIG. 7 is a fragmentary front elevational view of a modified frame showing different corner securing means at one miter joint;

FIG. 8 is a fragmentary rear elevational view of FIG. 7;

FIG. 9 is a sectional view taken along line 9—9 of FIG. 7, looking in the direction of the arrows;

FIG. 10 is a fragmentary exploded view showing the frame corner construction of the embodiments of FIGS. 7 and 8;

FIG. 11 is a fragmentary elevational view smilar to FIG. 7, showing still another modified frame corner construction; and

FIG. 12 is a sectional view taken from line 12—12 of FIG. 11, and looking in the direction of the arrows.

Referring now more particularly to the drawings, FIGS. 1–3 illustrate one embodiment of the improved frame member, per se, according to the invention, and a picture frame assembled from similar members. The picture frame, generally designated 10 in FIG. 1, is composed of identical top and bottom frame members 12, and identical opposed side frame members 14 each having beveled ends 16 adapted to be secured together in miter joints with adjacent frame members.

For a better understanding of the individual frame members constituting the picture frame 10, reference is made to the cross-sectional view in FIG. 2 wherein it is seen that the frame member 14 comprises two side strips 18, 20 of unequal widths, or heights, and of lengths corresponding to the selected length of the frame member. The strips are spaced apart and stand vertically on edge with their lower edges 22, 24 and upper edges 26, 28 respectively parallel. A first pair of aligned grooves 30, 32 is cut in the side strips at an inclination thereto near their upper edges and extending the full lengths thereof. A facing plate 34 connects the side strips and has its edges adhesively secured by glue, or other suitable means, not shown, in said grooves 30, 32. A second pair of aligned grooves 36, 38 is cut in one end of the member 14 and similarly receives a reinforcing plate 40. A third pair of aligned grooves, unnumbered and not shown, which are also preferably aligned with said second pair, are formed in the other end of the member 14 and receive a second reinforcing plate 42. Similarly, a fourth pair of aligned grooves 44, 46 is cut in the first end of the frame member 14 for glued reception of the edges of a third reinforcing plate 48 parallel to the first reinforcing plate 40. A fifth pair of aligned grooves in the other end of the frame member similarly receives a fourth reinforcing plate 50 parallel to the second reinforcing plate 42. The side strip 18 is rabbeted at 52 to receive an edge portion of the picture to be framed in the frame assembly.

Preferably, the thin side strips are made of inexpensive soft woods, while the even thinner facing plate 34 and comparatively thin reinforcing plates 40, 42, 48 and 50 are formed of Masonite, or hard board. Thus, only the upper, lower, and outside edges of the side strips need be smoothed to provide a pleasing finished appearance.

The other side frame member 14 is the exact duplicate of the frame member already described, and the upper and lower frame members 12 are also exactly the same except as to length. All four frame members are beveled at both ends, the bevels being cut through the side strips, the facing plates, and the reinforcing plates so that when the members 12, 14 are fitted together the miter joints 16 will be readily and accurately achieved.

It will be apparent from the above description of the construction of the basic frame member 12 or 14, that the side strips would tend to warp in planes perpendicular thereto and extending lengthwise of the strips; i.e., toward or away from each other, rather than edgewise in their own planes. The facing plate, however, is disposed at an angle to both side strips and its tendency to warp, if at all, would be in a perpendicular bisector plane which is at an angle to both side strips and also inclined with respect to said perpendicular warpage planes. Similarly warpage forces in the reinforcing plates would be directed in planes perpendicular to said warpage planes of the side strips. Consequently, the described arrangement of elements of the assembled frame will cause warpage forces to oppose and counteract each other and prevent any warpage whatsoever. Furthermore, the box-like construction and inset arrangement of the face and reinforcing plates with respect to the side strips yields a very strong, sturdy and rigid construction, despite the fact that the bottom side, opposite the face plate 34, is entirely open except for the presence at the ends of the pairs of parallel reinforcing plates 40, 48 and 42, 50.

Obviously in forming a frame member, other materials could be used, such as plastics or metals, or a combination of both, or a combination of wood and metal, or woods and plastics. The use of wooden side strips and a painted facing plate of metal would be a very desirable expendient without greatly increasing the cost. All of such combinations and selections would be warp-free and sturdy, for the reasons stated above.

To complete the description of the picture frame shown in FIGS. 1–3, it may now be explained that in each beveled end 16 of each frame member is drilled at least one, and preferably two dowel-receiving openings 53, which serves to guide and align the end of the adjacent frame member as they are assembled to form a miter joint. Dowels 54 are partially inserted to frictionally fit in the openings of one frame member. Consequently, the protruding portions of the dowels will slide into the cooperating and aligned openings in the adjacent frame member. To then clamp the joint permanently, or temporarily, a long bolt 56 having a screw threaded point 58 and threaded at 60 from the opposite end for most of its length is inserted longitudinally of the frame member 14 and between the pair of reinforcing plates 40, 48, the point 58 being screwed into a side strip 20 of the adjacent frame member 12 at a point between the reinforcing plates 42, 50 of said adjacent member. A clamping washer 62 and wing nut 64 are then threaded over the other end of the bolt 56 and the latter tightened to firmly engage the washer against the inner edges of the pair of reinforcing plates 40, 48. The four bolts 56, for the four corners, are preferably inserted longitudinally of the two side members 14, toward the upper and lower members 12. In this way, each corner is successively joined and secured to complete the picture frame 10.

To disassemble the frame it is only necessary to loosen the four wing nuts 64, unscrew the points 58 of the four bolts, and then pull apart the joint frame members. At such time, any two opposite, or all of the frame members may be cut in lines parallel to the bevel edge 16 at either end to reduce the length of the frame members by any desired amount. All that is necessary to perform these cuts is an ordinary carpenter's miter box and saw when the frame members are formed of wood and Masonite. Thus, a smaller picture frame can be reassembled from the cut members of the original

picture frame, and this ability for readily reducing the length of the frame member, and consequently the size of an assembled picture frame, may be practiced by the retailer in supplying customer requirements for special sizes.

FIGS. 4, 5 and 6 show cross-sections for modified frame members constructed in accordance with the same general scheme as described above, but differing considerably in appearance. In FIG. 4, for example, the parts of the frame member are identical with those shown in frame member **14**, FIG. 2, the only difference being that the outer side strip **20'** has been inclined outwardly and upwardly with respect to the vertical, inner side strip **18**. This, of course, changes the width and angle of the facing plate **34'**, as well as the width and appearance of the frame. If desired, a layer of plaster **66** may be added to the upper surface of the facing plate **34'** and while still in soft condition, sculptured or molded into pleasing curves simulating those of some conventional picture moldings. The plaster adheres readily to the Masonite, not only because of the inherent adhesiveness of the plaster, but also because of the network of grid lines pressed into the surface of the Masonite during fabrication, which lines provide interlocking channels, or a roughened surface, for reception of the plaster. The resultant appearance of the frame is improved by the plaster in proportion to the artistic skill used in sculpturing the plaster.

It will be noted that in both FIGS. 2 and 4 the assembled frame will have a shadow-box appearance when assembled, the facing plates **34**, **34'** being inclined inwardly and downwardly toward the picture bordering side strips **18**. In FIG. 5, however, a reverse shadow-box effect is obtained, the facing plate **34''** sloping downwardly and outwardly away from the picture bordering side strip **18''**. This effect is obtained by merely increasing the width, or height of the inner side strip **18''** and decreasing the width of the outer side strip **20''**. In all other respects the frame of FIG. 5 is identical with that of FIG. 2.

The frame member of FIG. 6 is similar to that of FIG. 4, except that the height of the inner strip **18*a*** is increased by securing a second strip **18*b*** above and disposed at an angle thereto, and placing the groove **30**, of the pair of grooves **30**, **32** which seats the facing plate **34*a*** in the upper strip **18*b*** rather than in the lower strip. The outer side strip **20*a*** is also increased slightly in height, but is disposed at approximately the same angle as in the FIG. 4 embodiment. Assembly of the FIG. 6 frame members yields a picture frame whch looks very much like that of FIG. 4, except for the embellishment about the picture wherein the added strips **18*b*** form the rabbeted groove **52*a*** in which the picture seats and the inner faces **18*c*** of these strips form a border of pleasing appearance sloped away from the picture.

In FIGS. 7–10 is shown another embodiment of a frame assembled from members **12**, **14** nearly identical with those of FIGS. 1–3, the primary modification being in the securing means for the corner miter joints **16**. Instead of the bolt **56** an L-shaped connecting plate **68** is utilized, having an aperture **70** in each of its legs so positioned as to fall under the inner edges of the reinforcing plates **40**, **48**, **42** and **50**. In assembling two adjacent frame members to form a frame corner, one leg **72** of plate **68** is slid between the pair of reinforcing plates **40**, **48** in one frame member, while the other leg **74** slides between the corresponding plates in the other frame member. A pair of wedges **76** is then inserted in apertures **70** from the open backs **77** of the frame members and driven home. By engagement with the inner edges of the reinforcing plates, the wedges force the frame members tightly together at the miter joint **16**. Thus, the miter joints at the corners are successively joined and secured by the members **68**, **76** to build the frame. To disassemble the frame it is merely necessary to pull the wedges **76** out of the apertures **70**, enabling the frame members to then be pulled away from each other at each corner.

An alternate securing means is shown which may be used instead of the wedges **76**. This involves openings **79**, one in each leg of connector **68**. These align with openings **81** in the reinforcing plates **40**, **48**, **42** and **50** for reception of pins driven in from the backs of the frame members.

In the FIG. 8 embodiment the dowel openings **53** receive dowel pins, one of which is shown at **54**, FIG. 8, for the same purpose as those shown and described in FIG. 3. An additional reinforcing plate **78** is added to the two side frame members **14**, particularly, if they are of very long length, as necessary in framing a large panoramic scene, for example. These added reinforceing plates are, desirably, also formed of Masonite like those at the ends of the frame members, and are glued into receiving grooves in the two side strips in the same manner. Desirably, one of the pairs of grooves which seats an end reinforcing plate is prolonged for the entire length of the frame member. This will enable the intermediate reinforcing plate **78** to be slid into position in the center of the frame member before the end reinforcing plates are inserted.

A further modified securing means is illustrated in FIGS. 11 and 12. In this embodiment, only one reinforcing plate **40** is utilized at each end of each frame member rather than a pair of parallel reinforcing plates. In one of the frame members the reinforcing plate **40'** is cut off square with the two side strips, as at **80**, to leave a space **82** between the outer edge **80** and the beveled edge of the reinforcing plate of the adjacent frame member. A bifurcated connecting bolt **56*a*** having a threaded point **58** is screwed into the outer side strip of one frame member before the adjacent frame member is positioned thereagainst at the miter joint. In positioning the second frame member, its reinforcing plate **40** is received between the two legs **84**, **86** of the connecting bolt. The outer ends of both legs of the bolt are threaded and a clamping washer **62*a*** having an oval opening, which will receive both legs **84**, **86**, is passed over the ends of the two legs and then tightly clamped against the inner edge of the reinforcing plate by application of a pair of nuts **64*a*** to the threaded ends of the legs of the bolt. In all other respects a frame assembled with the securing member shown in FIGS. 11 and 12 may be exactly the same as those previously described in FIGS. 1–3 and 7–10 embodiments. Obviously, to disassemble the frame, it is merely necessary to unthread the nuts **64*a*** accessible from the open backs of the frame members. The frame members may then be pulled apart at the miter joints. Once separated, the bolts **56*a*** may be unscrewed.

From the foregoing description of the invention it will be apparent that a novel and sturdy framing assembly, suitable for meeting the requirements of framing pictures, photographs, mirrors, advertising posters, and the like, is provided. The assembly includes corner couplings for releasably holding the assembled frame in its desired configuration for long periods of time, and permit the frame members to be easily and rapidly assembled and dissassembled. It will be understood that the principles and features described above and illustrated in the drawings may be applied to arrangements other than those shown, as for example, to framing of other shapes than the rectangular form illustrated, and to framing having other cross-sectional configurations.

Although certain specific embodiments of the invention have been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

What is claimed is:

**1.** A knock-down frame member of warp-free construction adapted to be assembled with similar members

of selected lengths to provide a frame suitable for pictures, posters, and the like, comprising a pair of elongated side strips spaced apart and standing on edge with their lower and upper edges respectively parallel to one another, a pair of aligned grooves one in each said side strips near the upper edge and extending the full length thereof, a facing plate connecting said side strips and having its edges adhesively secured in said pair of grooves, and a second pair of aligned grooves in said side strips near their bottom edges, a reinforcing plate connecting the side strips with its edges adhesively secured in said second pair of aligned grooves, the ends of said side strips and facing plate being beveled to enable miter joint assembly with similar frame members into a picture frame.

2. A frame member according to claim 1, wherein said second pair of aligned grooves is formed in one adjacent end of the side strips, a third pair of aligned grooves receiving the edges of a second reinforcing plate being formed near the bottom of the other end of the side strips.

3. A frame member according to claim 2, wherein said side strips are formed of wood, and said facing and reinforcing plates are formed of Masonite.

4. A frame member according to claim 3, wherein the outer face of one of said side strips is rabbeted for reception of a picture panel when the frame member is assembled with similar members into a frame.

5. A frame member according to claim 4, wherein each end face of said side strips is provided with a dowel-receiving aperture, whereby to properly align the frame member with an adjoining member on assembly and to lock the two members against lateral movements at the miter joint between them.

6. A frame member according to claim 1, wherein said pair of side strips is disposed at an angle to one another and said side strips differ in height, whereby to incline said facing plate with respect to said reinforcing plate.

7. A frame member according to claim 2, wherein fourth and fifth pairs of aligned grooves are provided one pair at each end of said side strips near their bottom edges and parallel to said second and third pairs of aligned grooves, and third and fourth reinforcing plates connect the side strips at each end with their edges adhesively secured in said fourth and fifth pairs of aligned grooves.

8. A frame member according to claim 7, wherein a sixth pair of aligned grooves is provided in said side strips intermediate their ends, and a sixth reinforcing plate connects the side strips with its edges adhesively secured in said sixth pair of aligned grooves.

9. A picture frame comprising a plurality of frame members according to claim 1, assembled in end-to-end relation to form miter joints between adjacent members, and means for securing said frame members together at each miter joint.

10. A picture frame according to claim 9, wherein



said means for securing adjacent frame member together comprises a bolt having a threaded point and threaded along its end opposite said point, said threaded point being screwed into a side strip of one of said frame members in a portion near said beveled end and a retaining washer and nut threaded on the other end of said bolt and engaging the inner edge of the reinforcing plate associated with the other frame member.

11. A picture frame according to claim 10, in which said bolt is bifurcated, its two legs embracing said reinforcing plate of the associated frame member.

12. A picture frame comprising a plurality of frame members according to claim 7, assembled in end-to-end relation to form miter joints between adjacent members, and means for securing said frame members together at each miter joint, said securing means comprising a bolt having a threaded point and threaded along its end opposite said point, said threaded point being screwed into a side strip of one of said frame members in a portion near said beveled end, said bolt extending across said frame member between a pair of its reinforcing plates and extending longitudinally between the corresponding pair of reinforcing plates of the adjacent frame member, and a retaining washer and nut threaded on the other end of said bolt and engaging the inner edges of the pair of reinforcing plates of the adjacent frame member.

13. A picture frame comprising a plurality of frame members according to claim 7, assembled in end-to-end relation to form miter joints between adjacent members, and means for securing said frame members together at each miter joint, said securing means comprises an angle plate having two legs, each of said legs being provided with an aperture therethrough, each of said legs sliding between the parallel pair of reinforcing plates at the ends of adjacent frame members to form said miter joint and to positions wherein said apertures in the legs are beyond the inner edges of said pairs of parallel reinforcing plates, and a pair of wedge members insertable in said apertures from the open bottom opposite said facing plates of said frame members to lock the members together, said wedges also bearing against the inner edges of said pairs of parallel reinforcing plates.


**References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 2,556,283 | 6/1951 | Lieberman | 40—152 |
| 2,623,316 | 12/1952 | Knox | 40—152 |
| 2,805,506 | 9/1957 | Thompson | 40—152 |



EUGENE R. CAPOZIO, *Primary Examiner.*

W. J. CONTRERAS, *Assistant Examiner.*

U.S. Cl. X.R.

40—10