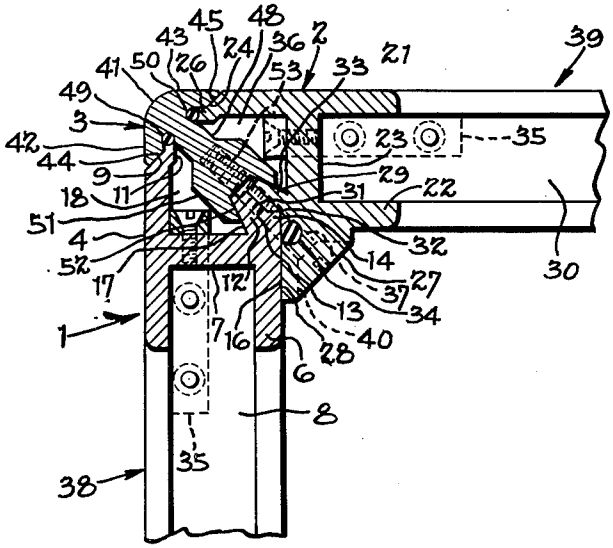
July 3, 1962 F. L. MICHAELS 3,042,158

DISPLAY CASE CONSTRUCTION

Filed June 26, 1961



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United States Patent Office

3,042,158
Patented July 3, 1962

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3,042,158

DISPLAY CASE CONSTRUCTION

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Filed June 26, 1961, Ser. No. 119,483
6 Claims. (Cl. 189—36)

This invention relates to display cases of the type used in museums, and more particularly relates to a frame construction for such cases.

In my U.S. Patent No. 2,344,161, issued March 14, 1944, and entitled "Exhibition Case Construction," there is disclosed a case formed from top, bottom, side and end panels which are connected together along their adjacent edges by mitered joint-forming frame members. Generally speaking, each panel is framed around each of its four edges by one of two types of interfitting frame members, in such order that a frame member of one type at one edge of a panel forms a joint with a frame member of the other type at the adjacent edge of an adjacent panel. The panels themselves, which may be either glass or an opaque material, are received in marginal slots provided along the inner edges of the frame members.

The frame members disclosed in my previously identified Patent No. 2,344,161 provide a miter joint between adjacent panels. The tightness of this joint has been found to be unduly dependent on the straightness and dimensional tolerances to which these members are formed. These members are usually extruded, and it has been found difficult in commercial practice to extrude such frame members to tolerances of the closeness required for really tight joints. On that account, the joints between such members are occasionally imperfect and not so tight as might be desired. Moreover, apart from the unpleasing appearance of an imperfect joint, the joint also may not be airtight and may be subject to some tampering in attempts to open it by inserting a prying tool in the crack between the frame members.

The present invention is directed to an improved framing member construction wherein a tight joint is provided which, moreover, is readily made airtight in commercial assemblies, and which is not subject to opening by prying or other similar external attack.

In accordance with this invention, the joint is preferably formed by frame members of the general type shown in my aforesaid U.S. Patent No. 2,344,161, but having outer legs which do not meet at the corner and which terminate short of each other. Adjacent its outer end, each leg presents a forwardly angulated surface and a rib. The frame member securing bar includes an integral nose portion which interfits between the outer ends of the legs, and which includes at each side edge an angulated surface that facially engages the respective angulated surfaces of the outer legs, and also includes a groove adjacent each angulated surface into which the respective ribs are sealingly locked. Thus the external joint is not in the form of a miter between the two frame members, but rather is formed on each side of the nose of the bar, each such joint being so angulated that it is pulled up tight as the bar is seated between the frame members.

The invention may best be further explained by reference to the accompanying drawing which is a cross-sectional view through a joint formed by frame members of a preferred type in accordance with the invention.

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The joint illustrated is formed by a pair of frame members which are designated generally by **1** and **2**, and by a clamping bar **3** which cooperates with the frame members to hold them tightly in joint-forming relationship.

As can be seen, the two frame members are similar in external form but differ in the configuration of their mating or abutting surfaces. Each edge of a panel is framed by either a member **1** or **2**, in such arrangement that each panel edge which is provided with a frame member **1** is disposed adjacent an edge of another panel which presents a frame member **2**, one of each type being required to form the joint. Thus, while some of the panels of a display case can be framed entirely in frame members of the same type, it will be apparent that both types of frame members **1** and **2** must be used on at least some of the panels to provide the appropriate matching at all of the edges of the case.

Frame member **1** includes an outer leg **4**, an inner leg **6** which is generally parallel to the outer leg, and a connecting web **7** which extends normally from approximately the midpoint of the outer leg **4** to the inner leg **6**. A panel-receiving groove or slot **8** is defined between the legs **4** and **6** and the web **7**. This slot **8** is adapted to receive a glass or opaque panel, not shown, which may be fitted airtightly into the slot in accordance with conventional sealing techniques.

Forwardly of web **7**, outer leg **4** of frame member **1** presents a slanted surface **9** which extends angularly forwardly preferably at an angle of 45° with respect to outer leg **4**. At the inner edge of slanted surface **9** a forwardly extending rib **11** is formed, the front edge of which is made concave to engage a round sealing strip, as will be explained.

Forwardly of web **7**, the inner leg **6** of frame member **1** presents an abutment lip **12** having a face **13** which forms an angle preferably of 45° with inner leg **6** and the plane of which passes forwardly of the end of rib **11** of outer leg **4**. A right angled shoulder **14** extends longitudinally where face **13** meets the surface **16** of inner leg **6**. The other side of abutment lip **12** is undercut, and presents a surface **17** which is acutely angulated with respect to faces **13** of abutment lip **12**. It can be seen that a concealed, generally triangular way **18** is defined between outer leg **4**, web **7** and lip **12**.

Frame member **2** also comprises an outer leg **21**, an inner leg **22**, and an integral connecting web **23**, which correspond respectively to the outer leg **4**, inner leg **6** and web **7** of frame member **1**. At its forward end, outer leg **21** presents a slanting surface **24** which extends at an angle of 45° with respect to the leg, and a rib **26** is formed at the inner edge of surface **24**. Surface **24** and rib **26** correspond respectively to surface **9** and rib **11** of member **1** as to shape and dimension. A panel-receiving groove or slot **30** similar to slot **8** of frame member **1** is defined between outer leg **21**, inner leg **22** and web **23** of frame member **2**.

Frame member **2** differs from frame member **1** in that an integral abutment rib **27** of substantially triangular cross section extends along inner leg **22**. Rib **27** has a face **28** which extends perpendicularly to leg **22** and which is adapted to abut face **16** of inner leg **6** of frame member **1**.

An abutment lip **29** is formed adjacent web **23** and inner leg **22**, and presents a face **31** the plane of which extends at an angle of 45° with respect to leg **22** and which

passes forwardly of rib 26 of the outer leg 21. A groove 32 is provided where face 31 of lip 29 meets face 28 of rib 27. When face 28 of rib 27 is in abutting relationship with face 16 of frame member 1, shoulder 14 seats in groove 32 of frame member 2 and the faces 13 and 31 of lips 12 and 29 respectively abut each other, as shown in the drawing. The other side of lip 29 of frame member 2 is undercut and presents a wedging surface 33 which forms an acute angle with respect to face 31, and, when the two frame members are placed together, forms an acute angle with the corresponding surface 17 of lip 12. A rounded groove 34 is formed in rib 27 entering on surface 28 thereof, to receive a sealing strip. A concealed way 36 is defined between leg 21, web 23 and lip 29.

Rib 27 of frame member 2 is drilled and lips 12 and 29 are grooved at spaced longitudinal positions so that when frame members 1 and 2 are placed together, openings 37 are presented to receive screws 40 the function of which will be explained.

The respective frame members 1 and 2 are connected to other frame members 38 and 39 corresponding to frame members 1 or 2, to form rectangular frames in the manner disclosed in my aforesaid Patent No. 2,344,161, for example by right angular mounting brackets 35 which are connected to the webs of the frame members by screws.

The clamping bar 3 whereby the two frame members 1 and 2 are tightly secured in joint-forming relation includes a nose portion 41, which may be rounded as shown, having exterior surfaces 42 and 43 which extend at right angles to each other. Faces 44 and 45 extend angularly from surfaces 42 and 43 respectively, and are adapted to facially engage the slanting surfaces 9 and 24 of the frame members. A narrow neck portion 48 is formed adjacent the nose portion 41 of bar 3 and extends at an angle of 45° with respect to the surfaces 42 and 43. Grooves 49 and 50 are formed in bar 3 on either side of neck 48 where it joins the nose, which grooves respectively receive a sealing strip and rib 11 of frame member 1, and a sealing strip and rib 26 of frame member 2.

At its concealed inner side, the bar 3 is provided with an enlarged portion 51 which presents a tapered longitudinal groove 52 having sides which are angulated corresponding to the angle between the wedging surfaces 17 and 33 of the frame members. The bar 3 is drilled and tapped from groove 52, as at 53, at intervals along its longitudinal dimension which correspond to the locations of the bores 37.

As can be seen from the drawing, in the joint provided by this invention, the face 28 of abutment rib 27 of frame member 2 resides against the inner surface 16 of frame member 1, and shoulder 14 is seated in groove 32. A sealing strip is seated in groove 34 and is compressed by surface 16 which bears upon it, to form a tight seal. The two faces 12 and 31 of frame members 1 and 2 respectively are also in engagement. Thus a gap or way 18, 36 is presented between the frame members.

The bar 3 is slid in longitudinal direction between the outer legs 4 and 21, into the way 18, 36. Sealing strips inserted in grooves 49 and 50 of bar 3 are compressed by engagement with ribs 11 and 26. The angulated faces 44 and 45 of nose 41 facially engage the slanting surfaces 9 and 24 of outer legs 4 and 21 respectively, and the lips 12 and 29 are received in wedging fashion in groove 52 of bar 3. The screws 40 are inserted and tightened in the aligned holes 37 and 53, to wedge the lips 12 and 29 tightly in groove 52, and simultaneously to draw the nose into tight engagement with the outer legs on each side of it.

The joint thus formed is exceptionally rigid and tight yet can be easily assembled. The tightness of the point is not so critically dependent on the tolerances to which the frame members and bar are made as the joint disclosed in the aforesaid U.S. Patent No. 2,344,161, and these members may be extruded in accordance with conventional forming techniques.

By reason of the angulated interfit between the edges 44 and 45 of the nose of the bar 3 and the respective faces 9 and 24 of the frame members 1 and 2, no crack or seam is presented which is subject to attack by prying. Moreover, the joint is effectively airtight.

While I have described the preferred embodiment of my invention, it will be understood that it may be modified within the spirit and scope of the claims which follow.

Having described my invention, I claim:

1. In a display case, the combination of a pair of frame members and a frame member joining bar in disconnectable joint-forming relation, said frame members being right angularly oriented with respect to each other and being formed to present a concealed longitudinal way between them, wedge-shaped abutting lips on said frame members extending longitudinally in said way, each said frame member being formed to present an outer leg, each said outer leg including an angulated surface at the outer end thereof, said bar being interfitted in said way between said outer legs, said bar comprising a nose portion having a face on each side thereof which facially engages the respective angulated surface of said outer legs, said bar presenting a groove in said way which receives said lips in wedging fashion, and screw means passing through said lips into said bar from said groove whereby said lips are held tightly in said groove and said faces are held in engagement with said surfaces to form a tight joint therebetween.

2. In a display case corner joint construction of the type including a pair of right angularly abutting frame members which define a longitudinal way between them and which present wedge-shaped abutting lips extending along said way angularly between said frame members, the improvement which comprises, an outer leg presented by each said frame member, said outer legs extending right angularly toward each other, each outer leg presenting an angularly extending surface adjacent its outer end, a bar member comprising a nose portion and means defining a lip receiving groove, said nose portion being disposed between said outer legs and presenting a surface at each side adapted to facially engage said angularly extending surface, said lips being wedged in said lip receiving groove, and screw means extending through said lips into said bar.

3. In a display case corner joint construction of the type including a pair of longitudinally abutting frame members which define a way between them and which present wedge shaped abutting lips disposed angularly in said way and including a bar which engages said lips in wedging fashion, the improvement which comprises, a leg presented by each frame member, said leg extending toward each other but terminating short of each other at their outer ends, each leg presenting at its outer end a forwardly angulated surface and a longitudinal rib, said bar including an integral nose portion which interfits between the outer ends of said legs, said nose portion presenting at each side thereof a surface which facially engages the respective angulated surface, and a groove in which the respective rib is seated.

4. In a display case corner joint construction of the type which includes a pair of longitudinally abutting frame members defining a way between them and presenting wedge shaped abutting lips disposed angularly in said way and which also includes a bar engaging said lips in wedging fashion, the improvement which comprises, an external leg presented by each frame member, the leg of each frame member extending right angularly toward the leg of the other frame member but terminating short of the leg of the other frame member, each leg presenting a forwardly angulated surface and an inwardly offset rib at its outer end, said bar including an integral nose portion which interfits between the outer ends of said legs, said nose portion presenting at each side thereof a face which is parallel to said wedging surface and a concealed groove inwardly adjacent said

face, the faces of said nose portion bearing on the respective surfaces of said legs to form a tight joint at each side of said nose portion, the ribs of said legs being seated in the respective grooves of said nose portion to lock said legs against inward movement relative to said bar.

5. The improvement of claim 4 wherein a sealing strip is disposed in each said groove and is compressed by the rib seated therein to form a tight seal between said nose portion and said leg.

6. The improvement of claim 4 wherein said nose portion presents external surfaces which are coplanar with the external surfaces of said legs.

No references cited.