May 11, 1965 R. C. ROOT 3,182,771

CORNER JOINDER OF CHANNELLED FRAMES

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FIG. 2

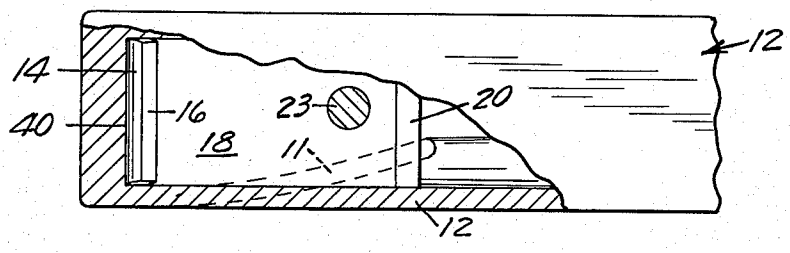



FIG. 1

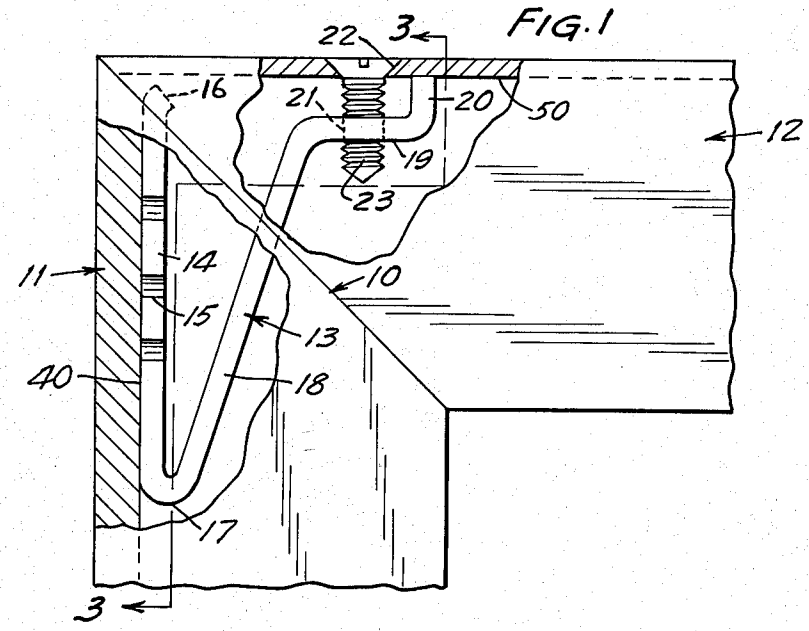
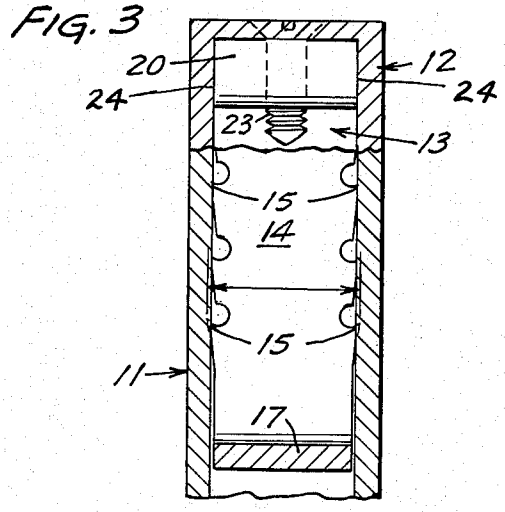



FIG. 3




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# CORNER JOINDER OF CHANNELLED FRAMES

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This invention relates to the joinder of two intersecting channelled frames at a corner by means of a contractable connector.

In the framing of thin planar panels, as in glaziery, it is oftentimes necessary to join the intersecting frames surrounding the planar panel at a sharp corner. Channelled rails have become increasingly utilized as frames because the surrounding planar panels e.g. glass plate, may be securely bound within the internal confines of the channelled rails without the use of separate auxiliary holding means e.g. plastic substances, holding brackets, etc.

Channelled rails are commonly used by glaziers in the assembly and installation of bathroom equipment e.g. tub and shower enclosures of glass or plastic panels. While strength characteristics of the framed structure including frame members in rigid linear and coplanar relationship is of primary importance, it is also desirable in such installations that the frame structure have aesthetic appeal including neat, tight, bevelled frame corners. Aesthetic appeal requires that the intersecting frames be in near perfect conterminous tight abutment; this requirement is difficult to achieve at the installation site with the portable tools available to the glazier, who from unsized rail stock must oftentimes size, cut, bevel, and connect four intersecting frames together about the planar panel. In the furtherance of aesthetic appeal, it is necessary that the intersecting frames be held in corner engagement with a minimum of visible connecting paraphernalia.

In the quest for maximum aesthetic appeal consistent with acceptable strength characteristics, frame connecting paraphernalia relied upon by the glaziery trade has been almost exclusively of the simple angle iron construction. In the prevalent case wherein the frame members are to intersect one another perpendicularly, the angle irons have two perpendicular legs, each of which is adaptable for rigid attachment against the internal confines of a channelled frame. In the L type angle iron the legs are unitarily joined together at a sharp 90 degree intersection; in the "gusset" type angle iron the perpendicular legs are unitarily joined together by an intervening oblique member. Upon secure attachment of the perpendicular legs to the channelled rails, both types provide rigidly perpendicular and coplanar frame members. Even in the case of perfectly bevelled rails, a neat tight corner will result only if the angle iron legs are attached at very precise positions (within five thousandths of an inch) along the internal confines of the channelled rails; normally, this is accomplished with screws or other holding means visibly passing through the channelled rail. Since it is at least as difficult for a glazier using portable equipment at the installation site to precisely position the angle iron legs, as it is to size, cut, and bevel the channelled rail, these cumulative errors make neat tight conterminous corners extremely difficult to achieve. Since rigid attachment with angle irons normally requires at least two independently positioned screws per angle iron leg (four screws per corner), not only is there inherent error in the independent positioning, but further the aesthetic appeal exposed surfaces of both rails is significantly diminished.

It is accordingly an object of the present invention to provide a neat tight conterminous corner juncture of two abutting bevelled channelled rails with a uitary contractable connector fittting wholly within the internal confines of the abutting rails so as not to interfere with a planar panel bounded thereby.



It is another object of the present invention to provide a neat tight conterminous corner juncture of two abutting bevelled channelled rails, one of the rails having a smooth regular exterior surface uninterrupted by holding means for the rail connector.

It is a further object of the present invention to provide as the rail connector one that may be secured to both rails so as to provide rigidly perpendicular rails without requiring a plurality of precisely positioned independent holding means for each rail connection.

It is a further object of the present invention to provide for two abutting bevelled channelled rails a unitary contractable connector which in its secure attachment to one of the rails with a single screw simultaneously draws them tightly into a neat tight conterminous corner while at the same time establishing the abutting rails in rigidly planar and linear relationship as determined by the abutting bevelled rails.

These and other objects and advantages are attained by means of a novel dimensionally contractable connector for the abutting bevelled channelled rails, the connector securely attachable to the internal confines of both rails with but a single exteriorly visible holding means, said holding means when applied having the ability to establish the bevelled rails in rigid linear and coplanar relationship while simultaneously drawing the abutting rails in a tight neat conterminous corner juncture.

In the drawing:

FIGURE 1 is a front view, with portions cut away to show constructional details, of two bevelled channelled rails joined together at a corner with the dimensionally contractable connector.

FIGURE 2 is a top view, with portions cut away to show constructional details, of the FIGURE 1 corner construction.

FIGURE 3 illustrates, in transverse section 3—3 of FIGURE 1, a detail partial side view of the corner construction.

In FIGURE 1, two longitudinally symmetrical rails of identical cross-section including channelled horizontal top rail **12** and channelled vertical side rail **11** are held in abutment at a bevelled corner junction **10** by means of the dimensionally contracted unitary connector device **13**. A first leg **14** of connector **13** is secured against the inner base **40** of vertical rail **11** by means of deformed serrations **15** wedged tightly against the internal side walls of vertical rail **11**. A terminal portion **16** of first leg **14** is upturned into the confines of and fits tightly between the internal side walls **24** of horizontal top rail **12**. Intersecting first leg **14** at an acute angle and integrally joined thereto at bifurcation **17** is second leg **18** which possesses a perforate minor medial section **19** within the internal confines of top rail **12** and which is substantially parallel to the internal base **50** of the top rail. A terminal section **20** of second leg **18** fits tightly between internal side walls **24** and is held in perpendicular abutment against internal base **50** by means of self-tapping screw **23** passing through perforation **22** of top rail **12** and through perforation **21** of minor medial section **19**. Attachment of self-tapping screw **23** through perforations **22** and **21** provides a leftward contraction of second leg **18** toward first leg **14**.

In FIGURE 2, the cross-sectional shape of the identical rails **11** and **12** is shown. The widest portion of the internal surface is the respective rail bases **40** and **50**; internal side walls e.g. **24**, slope inwardly so as to securely accommodate a thinner planar panel, not shown herein. Terminal portion **16** of first leg **14** is secured tightly between the internal side walls of top rail **12**.

In FIGURE 3, first leg **14** is shown wedged tightly be-

tween the internal side walls 24 of vertical side rail 11 by means of deformed serrations 15, the original undeformed contour of which is shown in dotted line.

The top and side rails are maintained in rigid linear and coplanar relationship by the serrated first leg 14 tightly secured between the internal sidewalls of side rail 11 and by the combination of first leg terminal portion 16 and second leg terminal section both of which are tightly secured between the internal sidewalls of top rail 12. Because it is desirable that at least three distinct portions of the connector be of the same width as the internal bases of the channelled rails, the connector may further be economically formed of one rectangular strip of metal.

The preferred method of utilizing the dimensionally contractable connector is as follows. Connector first leg 14 is forced between the internal side walls 24 of bevelled side rail 11 at a position whereby the first leg terminal portion 16 extends beyond the rail bevelled end. The bevelled end of top rail 12 is placed in abutment against bevelled end of side rail 11 so as to enclose terminal portion 16 and terminal section 20 within the internal confines of top rail 12. It is essential that a gap of at least 1/64 inch exist between the terminal section 20 and the top rail inner base 50. Self-tapping screw 23 is applied through perforation 22 of top rail 12 and through perforation 21 of minor medial section 19. As this is done, screw 23 applies tension along second leg 18 and first pulls terminal section 20 in substantially perpendicular abutment against top rail inner base 50 so as to constitute a fulcrum at the abutment. Continued tension applied through the screw 23 contracts the second leg 18 of the connector 13 leftwardly and upwardly about the fulcrum and toward first leg 14 thus pulling along the top rail 12 tightly against bevelled end of side rail 11. Thereafter continued tension applied through the screw 23 renders the bevelled ends neatly conterminous.

While it is essential in the use of the prior art angle iron constructions to perforate the channelled rails precisely to within about five thousandths of an inch to provide tight neat corners of even perfectly bevelled rails, the contractable connector device of the present invention is sufficiently adjustable that the single perforation required therefor may be positioned with much greater tolerance i.e. one hundred thousandths of an inch.

For most commonly encountered frame structures, the frame members are desired in perpendicular relationship to one another. However, provided that the bevelled ends are formed of the appropriate angle, the contractable connector of the present invention is adaptable for similarly securing frame members in whatever angular relationship desired. For non perpendicular frame members, the uncontracted second leg terminal section should be substantially perpendicular to the internal base of the rail by which it is enclosed.

Thus, the contractable connector device can be seen to provide a neat tight conterminous corner juncture of two abutting bevelled channelled rails while at the same time rigidly securing the abutting rails in a predetermined linear and coplanar relationship. The contractable connector fits wholly within the internal confines of the channelled rails so as to not interfere with a thin planar panel enclosed by the rails. The contractable connector requires but one exteriorly visible holding means at the juncture, one rail thus having a completely smooth exterior surface. The contractable nature of the connector disposes with the need for highly precisioned bevel lines and holding means perforations, thus enabling the glazier to accomplish factory quality work with the use of comparatively simple portable tools.



I claim:

1. A corner juncture comprising: a channelled vertical side rail having a bevelled end and a channelled top rail having a bevelled end, said bevelled ends being conterminously joined together rigidly by means of an angular connector wholly within the internal confines of said channelled rails said angular connector comprising: two distinct integral legs intersecting at an acute angle including:
   (*a*) a first leg a major portion thereof held in secure frictional engagement between the internal side walls of the vertical rail, said first leg having a terminal portion extending into and secured in frictional engagement between the internal side walls of the top rail, and
   (*b*) a second leg having three sections in order:
      (1) a major section immediately adjacent to said acute angle intersection and extending into the internal confines of said top rail,
      (2) a perforate minor medial section substantially parallel to said top rail internal base, and
      (3) a minor terminal section substantially perpendicular to said perforate minor medial section and being firmly held against said top rail internal base by tension means.

2. The corner juncture of claim 1 wherein the top and side rails are substantially perpendicular to each other and wherein the second leg minor medial section is substantially perpendicular to said vertical side rail.

3. An angular connector comprising two integral legs intersecting at an acute angle comprising: a first leg, a major portion thereof being linear and serrated along its edge, a terminal portion of said first leg opposite said acute angle intersection being upturned toward the second leg, said second leg having three sections in order:
   (*a*) a major section immediately adjacent to said acute angle intersection,
   (*b*) a perforate minor medial section, and
   (*c*) a minor terminal section substantially perpendicular to said perforate minor medial section.

4. The angular connector of claim 3 wherein the perforate minor medial section is substantially perpendicular to said first leg.

5. The angular connector of claim 3 wherein the angular connector is formed of a unitary rectangular strip of flexible structural material.

No references cited.

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