United States Patent [19]

Cox

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[45] **Apr. 29, 1975**

[54] **HARDWARE FOR A SLIDING DOOR INSTALLATION**

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[73] Assignee: **Arthur Cox & Sons,** City of Industry, Calif.

[22] Filed: **Feb. 20, 1973**

[21] Appl. No.: **333,640**

Related U.S. Application Data

[62] Division of Ser. No. 185,222, Sept. 30, 1971, Pat. No. 3,744,827.

[52] **U.S. Cl.** **52/720;** 52/656; 49/409; 49/411

[51] **Int. Cl.** **F16b 7/00**

[58] **Field of Search** ..... 49/409–411; 16/90–95; 52/475, 656, 720, 710, 731, 716, 614, 627; 160/381 X

[56] **References Cited**

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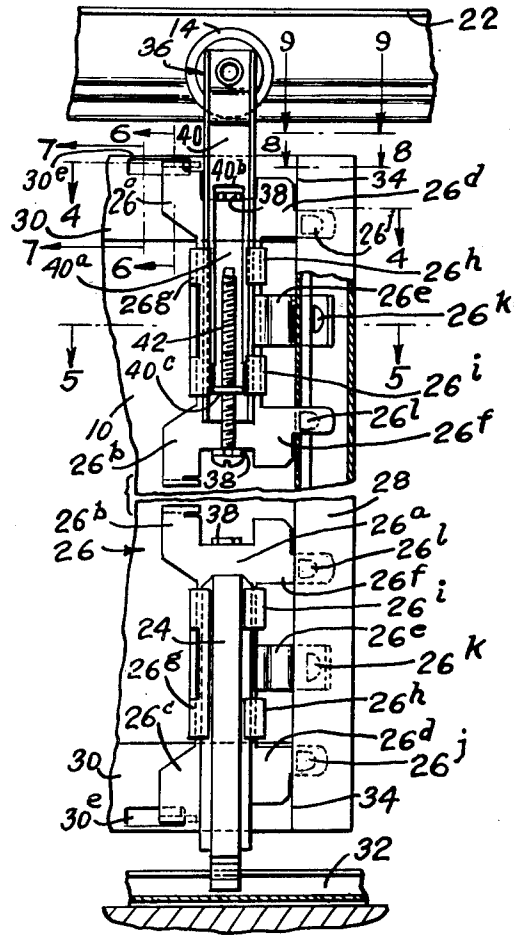
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Assistant Examiner—Robert Farber
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[57] **ABSTRACT**

A sliding door installation in a doorway. Framed door panels are guided over threshold trackways and suspended from roller wheels in trackways at the top of the doorway. Corner brackets interconnect rails and stiles framing the door panels. Identical brackets interchangeably utilizable to carry roller wheels or floating guides interconnect the rails and stiles at the corners of the door panels. The brackets include three spurred lugs for securing the brackets to the rails and stiles. The rails and stiles are designed to be interconnected by the brackets to form a sturdy frame around the door panel edges.

6 Claims, 9 Drawing Figures



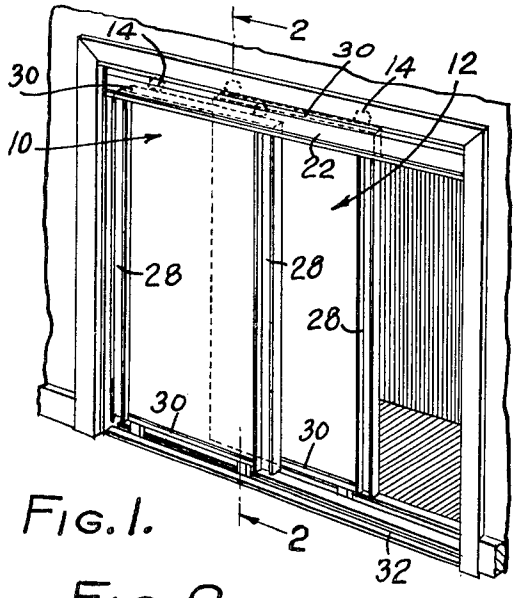


FIG. 1.

FIG. 2.

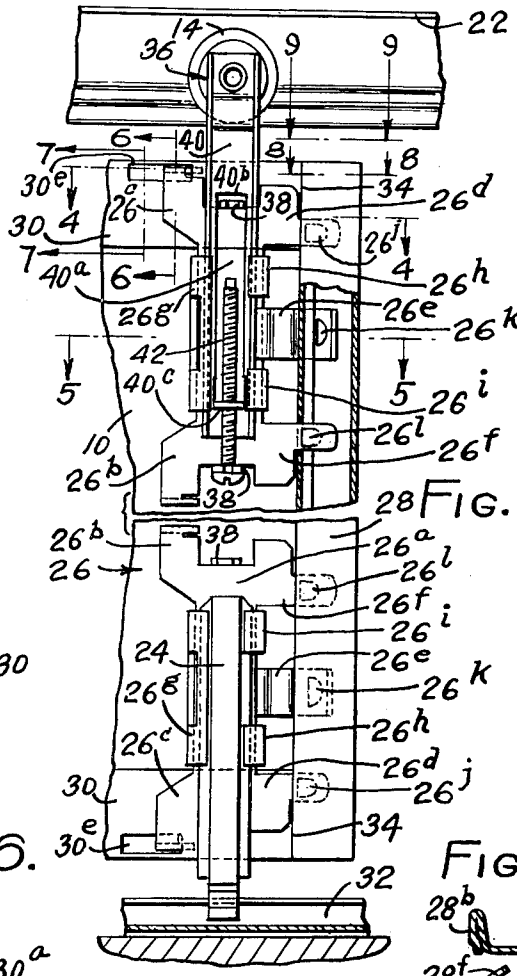
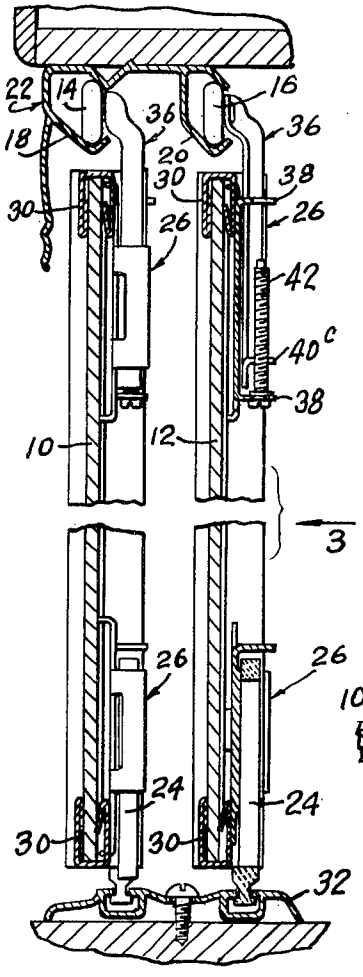


FIG. 3.



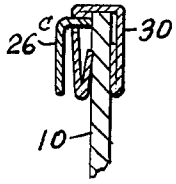


FIG. 6.

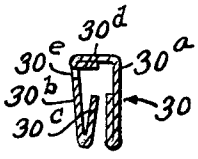


FIG. 7.

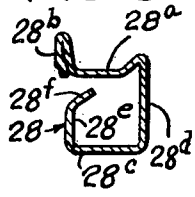


FIG. 8.

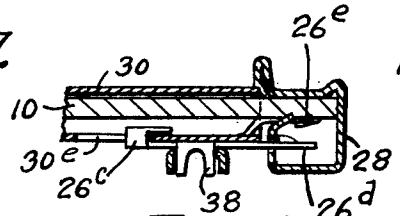


FIG. 4.

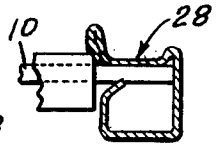


FIG. 9.

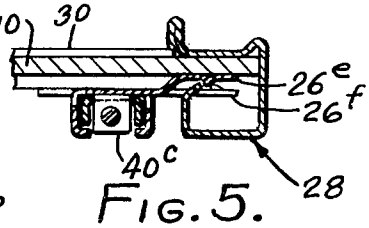


FIG. 5.

HARDWARE FOR A SLIDING DOOR INSTALLATION

This application is a divisional application of Ser. No. 185,222, filed Sept. 30, 1971 and now U.S. Pat. No. 3,744,827.

The instant patent application relates to subject matter also contained in another concurrently filed patent application filed by the same inventor. The latter application discloses and claims a different invention not disclosed and claimed in the instant application.

The invention pertains to hardware for installing framed door panels in doorways in sliding door installations.

Sliding door installations are commonplace and various patents have been granted for improvements in this art. Two U.S. patents are herewith cited as being of general interest; U.S. Pat. Nos. 3,058,173 and 3,261,129, for their disclosures pertaining to sliding door installations.

The present invention pertains to improved corner brackets for sturdily interconnecting rails and stiles framing door panels and also pertains to the rails and stiles themselves and in combination with the corner brackets and door panels.

The present invention provides an improved corner bracket of the type utilized to interlock door panel rails and stiles to form a concealed corner butt joint at the door panel corners to provide a door panel frame of rails and stiles that is very sturdy. The brackets can be utilized at any corner to provide reinforcement for the door panel.

In accordance with the present invention, the brackets each include three spurred locking lugs for attaching the brackets to the stiles. These lugs, together with spear lugs of the bracket, lock a stile and rail at four points to achieve the desired butt joint.

In general, brackets of the present invention include two spurred locking lugs that engage alignment slots in the door stiles and an additional spurred locking lug that engages with the holding edges of the door stiles between rear walls of the stiles and the rear side of the door panels. The three locking lugs wedge portions of the material of the stiles. The rails and stiles include front, intermediate, and rear walls that form a channel receiving the respective door edges.

Accordingly, it is an object of the present invention to provide corner brackets having three spurred lugs and adapted to interconnect rails and stiles that frame a door panel.

Another object of the present invention is to provide rails and stiles suited for utilization in conjunction with the brackets.

Other objects, advantages, features and results of the present invention will be evident in light of the description hereinafter of the accompanying drawings in which:

FIG. 1 illustrates two sliding doors installed in the doorway of a wardrobe closet.

FIG. 2 is a fragmentary sectional view, taken along lines 2—2 of FIG. 1, illustrating two sliding doors suspended from upper trackways and guided over lower trackways of a threshold.

FIG. 3 is a view taken looking in the direction of the arrow in FIG. 2, which further illustrates the manner in which a framed door panel is provided with corner brackets, suspended from an upper trackway, and guided over a lower trackway.

FIG. 4 is a view taken along lines 4—4 of FIG. 3, depicting certain features illustrative of the present invention.

FIG. 5 is a view taken along lines 5—5 of FIG. 3, depicting additional features of an actual embodiment of the present invention.

FIG. 6 is a view taken along lines 6—6 of FIG. 3 illustrating the upper rail in FIG. 3 in combination with a rail locking spear or lug and the top of the door panel.

FIG. 7 is a view taken along line 7—7 of FIG. 3 illustrating the shape of the upper rail of FIG. 6 where seen in transverse cross section.

FIG. 8 is a view taken along line 8—8 of FIG. 3 illustrating the shape of a vertical stile when seen in transverse cross section.

FIG. 9 illustrates the combination of the rail, stile and door panel and their arrangement in the structure depicted in FIG. 3 and is a view taken along line 9—9 thereof.

Referring to FIG. 1, there is illustrated a sliding door installation such as may be installed in the doorway of a wardrobe closet. Door panels **10, 12** are suspended from roller wheels **14, 16** shown in FIG. 2, resting on trackways **18, 20** of a metal member **22** secured to the top of the doorway. The door panels are guided for sliding movements by guides **24** (FIG. 3) carried by brackets **26** attached to stiles **28** and rails **30.** The guides **24** are situated in trackways of a threshold **32** at the bottom of the doorway.

The door panels **10, 12** are made of plywood, typically 0.25 inches thick, or any suitable material and are reinforced by two rails and two stiles fitted onto the panel edges. The rails **30** are fitted on the top and bottom edges and the stiles **28** are fitted on the vertical side edges of each door panel. The rails and stiles are constructed differently, the rails all being identical and the stiles all being identical.

In FIG. 2 it is shown that the brackets **26** are situated on the rear side of the door panels **10, 12** at both top and bottom corners of each door panel; there being four identical brackets for each door panel. The rails **30** are typically of a length about 1.5 inches shorter than the top and bottom panel edges and the stiles **28** are typically of a length about 0.125 inches shorter than the panel vertical edges. The rails **30,** as shown in FIG. 7 each include a front wall **30*a*** with a portion folded double, a rear wall **30*b*** with a longitudinal holding flange **30*c***, and an intermediate wall **30*d***, so that the rail forms a longitudinal channel therein.

The stiles **28,** as shown in FIG. **8,** each include a front wall **28*a***, with a folded double gripping flange **28*b***, a rear wall **28*c***, an intermediate wall **28*d***, an an additional wall **28*e*** having an integral holding flange **28*f*** terminating in a longitudinal holding edge. The walls of each stile form a longitudinal channel therein. The rails and stiles are made of resilient metal so that a door panel can be wedged into the channels thereof in the fashion indicated in FIGS. **6** and **9.**

Each door panel **10, 12** has a guide in a bracket **26** at a respective bottom corner portion thereof and also has a roller wheel arrangement carried by a bracket **26** at a respective top corner portion thereof. These brackets all are mounted on the rear face of the respective door panel by bracket lugs that secure each bracket to a particular rail and a particular stile.

As seen in FIG. 3, the top and bottom rails 30 meet at concealed butt joints 34 with respective end portions of the vertical door panel edge. Also, as seen in FIG. 3, each bracket 26, made of metal, includes a generally flat base 26*a* including a rectangular area; a pair of spear lugs 26*b*, 26*c*, and three spurred locking lugs 26*d*, 26*e*, 26*f*. Each bracket has integral side legs 26*g*, 26*h*, 26*i* that are generally perpendicular to the base 26*a* and that together form a channel receiving either a plastic guide 24 or a roller wheel assembly 36.

The bracket legs 26*g*, 26*h*, 26*i* include flanges bent over as shown in FIG. 3, that cooperate to hold the guide 24 within the bracket so as to permit vertical movement of the guide relative to the bracket.

The bracket lugs 26*d*, 26*f* project laterally from the rectangular base area and are essentially coplanar therewith. The bracket lugs 26*e* project laterally also and in addition are bent twice between the rectangular base areas and the lug's extremities so that each lug 26*e* is not coplanar with the lugs 26*d*, 26*f* but is offset therefrom so that this particular lug (26*c*) can be inserted as shown between the rear face of the door panel and the stile holding flange 28*f*. The lugs 26*d*, 26*e*, 25*f* each have a spur, identified respectively as 26*j*, 26*k*, and 26*l* project from their lugs toward the door panel and the spur 26*k* projects from its lug away from the door panel.

Spear lugs 26*b*, 26*c* are identical and each is slotted near its tip and bent over thereat to form a spear tip, perpendicular to the balance of the spear lug, that projects toward the door panel. Each bracket has two forked legs 38 that are vertically spaced and situated at opposite ends of the bracket rectangular base area. Each forked leg 38 forms a U-shaped slot (see FIG. 4) and projects perpendicularly to the rectangular base area away from the door panel. In FIG. 3, one of the legs 38 of the lowermost bracket is not visible as it is situated behind the guide 24.

The uppermost bracket 26 carries an elongated support 40 having attached thereto the roller wheel 14 to form the roller wheel assembly 36. The support 40 has an elongated slot 40*a* terminating at one end at 40*b* and at the other end at a threaded nut 40*c* integral with the support. The nut 40*c* is a square shaped metal tab, shown in FIG. 5, having a threaded circular opening that projects away from the door panel and which is perpendicular to the bracket rectangular base area. A threaded machine screw 42 is threaded into the threaded opening of the nut 40*c* and the head of the machine screw is situated below the forked bracket leg 38 with the machine screw passing through the U-shaped slot thereof. The support 40 is guided for vertical movement by the bracket legs 26*g*, 26*h*, 26*i*. When the machine screw is rotated, the longitudinal positioning of the roller wheel 14 relative to the bracket 26 is readily established.

Each rail 30 has an alignment slot 30*e* (see FIGS. 3, 4, 6 and 7) near each end of its length that is located a predetermined distance from the adjacent rail end. Each alignment slot 30*e* is longer than the spear tip of the spear lugs 26*b*, 26*c*. Each stile 28 has two vertically spaced alignment slots (not labelled) in the stile wall 28*e* that are each located a respective predetermined distance from the adjacent stile end. Each stile alignment slot is at least as wide as the width of the spurred lugs 26*d*, 26*f*.

To assemble the brackets 26 with the rails 30 and stiles 28 in the manner indicated in the figures, the spear lugs 26*c* are inserted into the rail slots 30*e*. Simultaneously, the locking lugs 26*d*, 26*f* are inserted into the two alignment slots near the end of the stile 28 adjoining the rail 30 and the locking lug 26*e* is inserted between the holding edge of the holding flange 28*f* of the stile and the rear face of the door panel 10. The stile holding flange 28*f* and front wall 28*a* capture the door panel near the vertical edge thereof. The bracket is then pushed toward the stile (to the right in FIG. 3) to position the spurs 26*j*, 26*l* of the lugs 26*d*, 26*f* inside the stile wall 28*e*, and to position the spur 26*k* of the lug 26*e* inside the stile channel adjacent the holding edge of the holding flange 28*f*. When this is done, the spear lugs 26*c* are positioned in the rail alignment slots 30*e*, as shown in FIG. 4, and the lugs 26*d*, 26*e*, 26*f* are positioned in the stile alignment slots and between the panel door and holding flange as aforesaid as indicated in FIGS. 4, 5, and 6. The lugs 26*d*, 26*e*, 26*f* deflect as their spurs are being positioned as shown in FIG. 3, then return toward their undeflected condition upon full assembly of each bracket with rail and stile. As a result, the material of the stile is wedged between the three lugs 26*d*, 26*e*, 26*f*.

An exemplary embodiment of the invention has been disclosed herein; however, it will be understood that various changes, modifications, and substitutions may be made by one skilled in the art without departing from the spirit of the invention as defined by the following claims.

I claim:

1. A rail for framing an edge of a panel, the rail comprising:

an elongated frame member having front, intermediate and rear walls forming an elongated channel for receiving the edge of a panel and also having a holding flange integral with said rear wall that extends toward said intermediate wall;

said rear wall being angled relative to said front wall so that the distance between said rear and front walls decreases with increasing distance from said intermediate wall;

said holding flange diverging away from rear wall with decreasing distance of said holding flange from said intermediate wall;

said rear wall having a respective alignment slot near each end thereof being located a predetermined distance from the adjacent end of said rear wall; and

said frame member including an integral tab portion adjacent to said slot and extending inward within said channel adjacent to said intermediate wall restricting the width of said channel in the region of said intermediate wall.

2. The rail set forth in claim 1 wherein said front wall is folded double with the longitudinal edge of said front wall being disposed within said channel;

said front wall being folded to form a reentrant portion with the end of said reentrant portion being inside of said channel and located in the region of the edge of said holding flange whereby a panel held within said rail includes a portion held between embracing edges of said rail and said reentrant portion.

3. The combination in accordance with claim 1 wherein said tab portion includes an edge exposed to said channel for receiving a panel edge.

4. A stile for framing an edge of a panel, said stile comprising:

an elongated frame member having front, intermediate and rear walls defining an elongated channel therebetween an additional wall integral with said rear wall projecting toward said front wall for use as a holding flange;

said additional wall being bent between said rear wall and its longitudinal holding edge to define a longitudinal portion of said additional wall that angles toward said front and intermediate walls;

said front wall including an outward extending reentrant portion having a return portion including an edge adjacent to said elongated channel whereby a panel positioned within the channel of said stile includes a region embraced by the edges of said longitudinal holding edge and said adjacent edge of said return portion;

wherein said return portion of said outward extending reentrant portion includes a longitudinally extending recess adjacent to the edge portion of said return portion.

5. The combination in accordance with claim 4 including panel means extending into the channel defined by said stile;

a rail including a channel portion;

the channel portion to said rail embracing an adjacent edge of said panel;

the end of said rail terminating in the said longitudinally extending recess of said stile.

6. A rail for framing an edge of a panel, the rail comprising:

an elongated frame member having front, intermediate and rear walls forming an elongated channel for receiving the edge of a panel and also having a holding flange integral with said rear wall that extends toward said intermediate wall;

said rear wall being angled relative to said front wall so that the distance between said rear and front walls decreases with increasing distance from said intermediate wall;

said holding flange diverging away from rear wall with decreasing distance of said holding flange from said intermediate wall;

said front wall being folded to form a reentrant portion with the end of said reentrant portion being inside of said channel and located in the region of the edge of said holding flange whereby a panel held within said rail includes a portion held between embracing edges of said rail and said reentrant portion.

* * * * *