United States Patent

Cox

[15] **3,701,179**

[45] **Oct. 31, 1972**

[54] **GUIDES FOR SLIDING DOORS**

[72] Inventor: **Arthur T. Cox,** 18311 E. Railroad St., Industry, Calif. 91745

[22] Filed: **Sept. 30, 1971**

[21] Appl. No.: **185,221**

[52] **U.S. Cl.**.....**16/90,** 49/411, 24/201 A

[51] **Int. Cl.**.....**A47h 15/00,** E05d 13/02

[58] **Field of Search** ....16/90, 91, 93, 94, 95; 49/410, 49/411; 24/206 R, 201 A, 265 CD, 230.4 S; 248/361

[56] **References Cited**

UNITED STATES PATENTS

3,052,930	9/1962	Mathews	49/411
3,653,157	4/1972	Casebolt	49/411
995,960	6/1911	Gray	16/90
3,261,129	7/1966	Brydolf et al.	49/411
2,774,998	12/1956	Kiekert	16/91

FOREIGN PATENTS OR APPLICATIONS

1,934,045	4/1969	Germany	16/93 R

Primary Examiner—Bobby R. Gay
Assistant Examiner—Peter A. Aschenbrenner
Attorney—J. Calvin Brown

[57] **ABSTRACT**

This invention pertains to hardware for installing framed door panels in a doorway to provide a sliding door installation. Door panels are framed with rails and stiles that are interconnected at the door corners by identical brackets. The brackets at the top corners of the doors are used to carry roller wheels that rest on upper trackways of the doorway and the brackets at the bottom corners of the doors are used to carry guides that guide the doors over the trackways of a threshold of the doorway.

8 Claims, 10 Drawing Figures

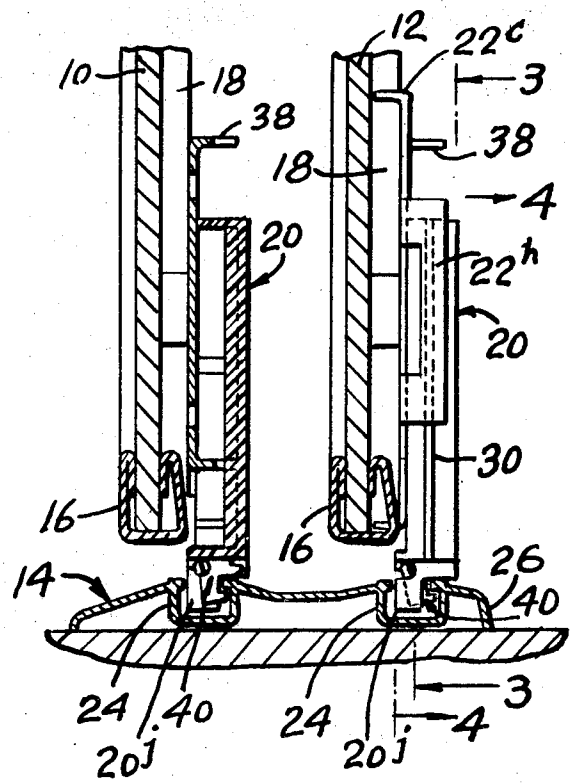


FIG. 1.

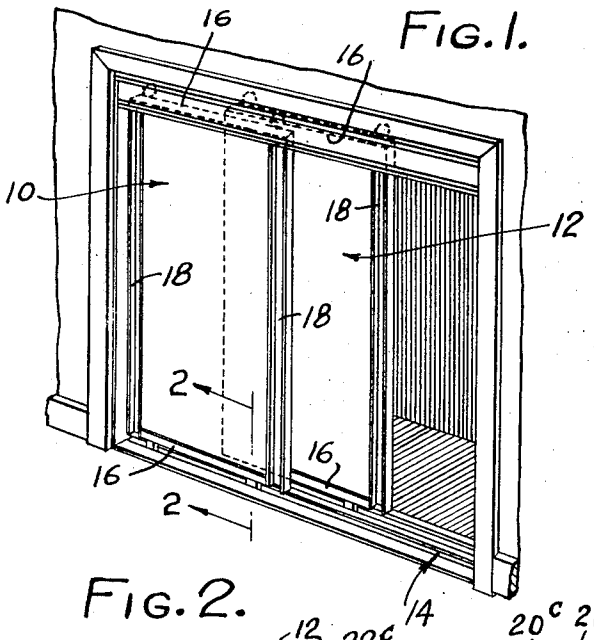
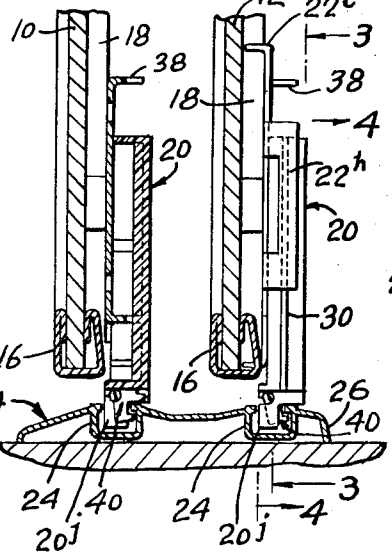


FIG. 2.



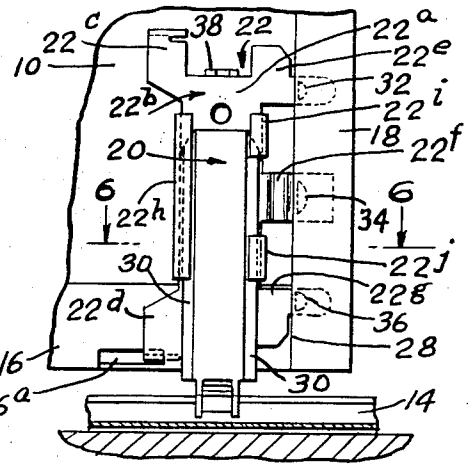


FIG. 3.

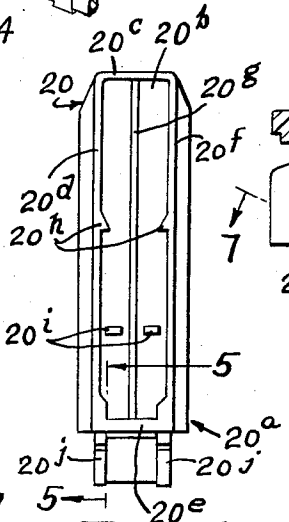


FIG. 4.

FIG. 5.

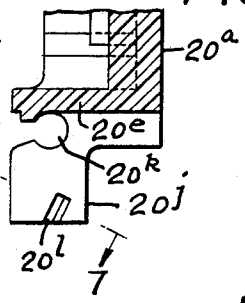


FIG. 7.

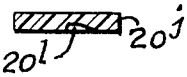


FIG. 6.

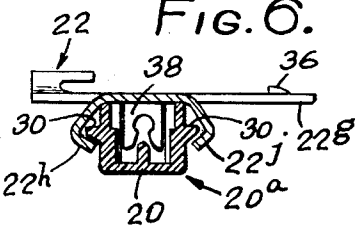


FIG. 8.

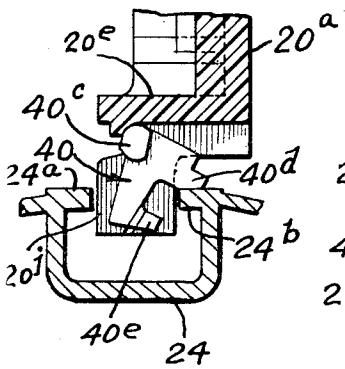


FIG. 9.

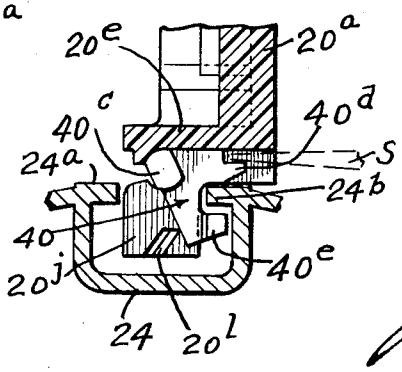
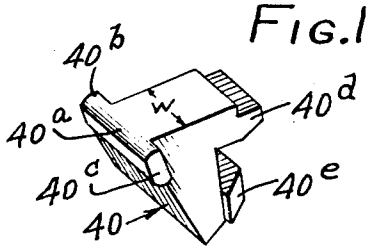


FIG. 10.



INVENTOR,
ARTHUR T. COX;
BY
Calvin Brown,
ATTORNEY

GUIDES FOR SLIDING DOORS

The instant patent application relates to subject matter also contained in another patent application concurrently filed, having the same inventor. Such patent application discloses and claims an invention that is different from that disclosed and claimed in the instant application.

Sliding door installations are in widespread use. Two U. S. Pat. Nos. 3,058,173 and 3,261,129 contain disclosures pertaining to sliding door installations that are representative of the prior art and also provide background information useful in obtaining a full understanding of the present invention.

The present invention relates in particular to floating guides that incorporate a latch element and that are floatingly secured to corner brackets on framed door panels to guide the same over a threshold trackway.

An important object of the present invention is to provide an improved floating guide carried by a bracket secured to a rail and a stile secured to a door panel. When the framed door panel is installed in a doorway a latch element of the guide engages a threshold trackway at the bottom of the doorway to guide the gramed door panel or door during sliding of same over the trackway.

Another important object of the invention is to provide guides at the bottom of a sliding door that is movable along a threshold trackway having a longitudinal groove defined by longitudinal lips of the trackway.

Various objects, advantages, features and results of the present invention in addition to those listed hereinabove will be evident to those skilled in the art to which this invention relates in light of this disclosure and subj objects, advantages, features and results may be achieved with the exemplary embodiment of the invention described in detail herein and illustrated in the accompanying drawings in which:

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

FIG. 2 is a fragmentary sectionalized view, taken along line 2—2 of FIG. 1, showing the fashion in which the doors of FIG. 1 are guided over trackways of a threshold at the bottom of the doorway.

FIG. 3, a view taken along line 3—3 of FIG. 2, illustrates a bottom corner of a sliding door framed by a rail and stile that are interconnected by a bracket carrying the guide of the invention that engages a lip of a threshold trackway.

FIG. 4, a view taken along line 4—4 of FIG. 2, shows an element of the guide of the invention.

FIG. 5, a view taken along line 5—5 of FIG. 4, is an enlarged view of a portion of the element shown in FIG. 4.

FIG. 6, a view taken along line 6—6 of FIG 3, shows the guide element of FIG. 4 in combination with a portion of the bracket.

FIG. 7, a view taken along line 7—7 of FIG. 5, showing a locking recess in a leg of the element shown in FIG. 4.

FIGS. 8 and 9 are similar views showing a latch element of the guide in relation to a threshold trackway. FIG. 8 shows the latch element being inserted into a trackway groove in order to engage the slide to the trackway and FIG. 9 shows the latch element as positioned after engagement of the guide with the trackway.

FIG. 10 shows the latch element of the guide.

Referring to FIG. 1 of the drawings, there is illustrated a sliding door installation, such as may be utilized in the doorway of a wardrobe closet, having two identical door panels **10** and **12** installed for sliding movement in a doorway. These panels are suspended from roller wheels resting on trackways affixed to the top of the doorway and are guided for sliding movement by guides inserted into trackways of a threshold **14** at the bottom of the doorway. The roller wheels are carried by brackets identical to that shown in FIG. **3**.

The door panels **10, 12** are made of plywood, typically 0.25 inches thick, or other suitable material and are reinforced by frame members, called rails and stiles, fitted onto the door panel edges. A rail is fitted onto the top and bottom edges of each door panel and a stile is fitted onto each vertical side edge of each door panel to reinforce the door panels. The rails are all identical to one another and the stiles are all identical to one another. Thus, rails **16** and stiles **18** engage the edges of each door panel **10, 12**.

in FIG. **2**, bottom portions of the door panels **10, 12** are shown with their bottom edges wedged into rails **16**, made of metal. The rails are typically 1.5 inches shorter than the bottom edges of the door panels and the stiles **18** (see FIG. **3**) are typically 0.125 inches longer than the vertical edges of the door panels. The rails **16** and stiles **18** include walls forming a channel in which the door panel edges are fitted. As can be seen in FIG. **2**, each rail **16** includes a front wall that is folded double along its length, a rear wall folded double along its length and an intermediate wall connecting the front and rear walls thereof. The rails are made of resilient material, as are the stiles, so that the panel edges can be wedged into the rail channels.

Each door panel **10, 12** is provided with two guides **20**, one at each lower corner of each door panel, mounted thereon by a respective corner bracket **22** that is secured to the lower rail **16** and an adjacent vertical stile **18**. In FIG. **2** only one of the two guides affixed to each door panel is visible.

The guides **20** are situated on the rear face of the door panels **10, 12** and extend downwardly therefrom into trackways **24** of a threshold **26** of the doorway. The brackets **22** utilized to support the guides **20** are all identical to the bracket **22** shown in FIG. **3** which is a view of the rear bottom right corner of the door panel **10**.

As seen in FIG. **3**, lower rail **16** and vertical stile **18** meet at a concealed butt joint **28** located laterally away from the right vertical edge of the door panel. The bracket **22**, made of metal, includes a generally flat base **22*a*** having a main rectangular area **22*c***; a pair of spear lugs **22*c***, **22*a***; and three locking lugs **22*e***, **22*f***, and **22*g***. The bracket has integral side legs **22*h***, **22*i***, and **22*j*** that are generally perpendicular to the rectangular base area **22*b*** to define a channel in which a molded plastic part **20*a*** of the guide **20** is disposed. The part **20*a*** includes a pair of shoulders **30**; shown also in FIG. **6**, and the bracket legs **22*h***, **22*i***, **22*j*** include flanges bent as shown in FIG. **6** for holding the part **20*a*** in the bracket **22** and for permitting vertical movement of the guide part **20*a*** relative to the bracket **22**.

The locking lugs **22*e*** and **22*g*** project lagerally from the bracket base area **22*b*** and are generally coplanar therewith. The locking lug **22*f*** projects laterally from the bracket base area **22*b*** but is bent twice between the

area 22*b* and the lug's extremity so that the lug is not coplanar with the area 22*b* but is offset from the plane of the base area 22*b* in order that this lug can be inserted, as shown, between the rear face of the door panel 10 and the rear wall of the stile 18. The lugs 22*e*, 22*f*, 22*g* each include a projecting locking spur, 32, 34, and 36, respectively, for a purpose to be described hereinafter. The spurs 32 and 36 project rearward from their respective lugs, while the spur 34 projects forward from its lug in the view shown in FIG. 3.

The spear lugs 22*c* and 22*d* are identical and each is slotted near the tip thereof and bent at the tip so as to define a spear tip, perpendicular to the portion of the lug adjacent to the base area 22*b* that projects rearwardly in the view of FIG. 3. A forked leg 38 at each end of the base area 22*b* projects forward in the view of FIG. 3 and each forked leg 38 defines an open-ended U-shaped slot therein. In FIG. 3, only one of the legs 38 is visible and the other is disposed behind the guide part 20*a*.

The bracket 22 is so constructed that it can be utilized at any of the four corners of the door panel 10 to interconnect a particular rail and stile together in a manner to be described hereinafter, and to carry either a guide 20 as shown in the various figures or a roller wheel assembly, depending upon whether the particular corner where the bracket is located is an upper corner or a lower corner of the door panel. The rail 16 has an alignment slot 16*a* in its rear wall. The slot 16*a* is located a predetermined distance from the rail end that abuts the stile 18. The stile 18 has two vertically spaced alignment slots (not labelled) in a stile wall that extends from the rear stile wall (visible in FIG. 3) toward the door panel 10. The alignment slots are located at predetermined distances of the vertically lowermost end of the stile 18.

In order to assemble the guide and bracket to the rail and stile on the door panel as is shown in FIG. 3, the assembled guide and bracket are placed adjacent the rail and stile and the spear lug 22d is inserted into the rail alignment slot 16*a*. At the same time, the locking lugs22*e*, 22*g* are inserted into the stile alignment slots while the locking lug 22*f* is inserted between a holding flange of the stile and the rear face of the door panel. The locking flange is an integral part of the stile that normally presses against the rear side of the door panel to capture the door panel between the holding flange and the front wall of the stile which is disposed on the other, or front, side of the door panel. The bracket is then pushed to the right in the view of FIG. 3 to cause the locking spurs 32, 36 to enter the channel of the stile via the stile alignment slots and to cause the locking spur 34 to pass behind the holding flange and over the rear side of the door panel and to the right of the holding flange. When the bracket is as far to the right as it will go, the spear tip of the spear lug 22*d* holds the bracket to the rail 16, the spurs 32 and 36 engage the stile alignment slots from the inside of the stile channel, and the spur 34 engages the inside edge of the holding flange from inside the stile channel. The lugs 22*e*, 22*f*, 22*g* are somewhat resilient and are resiliently deflected as the lugs enter the stile alignment slots and the small gap that normally exists between the stile holding flange and the rear side of the panel. The spurs, being resilient, tend to return to their undeflected positions upon full assembly of the bracket with the rail and stile, so that the material of the stile is wedged between the three locking lugs 22*e*, 22*f*, 22*g* with the spurs lockably engaging the adjacent portions of the stile.

The bracket 22 is secured to the rail 16 and stile 18 at four points by means of the spear lug 22*d* and the spurred locking lugs 22*e*, 22*f*, 22*g*. The three locking lugs automatically assume a wedging position relative to the stile wherein a portion of the stile is wedged between the lugs 22*e*, 22*g*, and the lug 22*f*. The lug 22*f* at entry into the gap between the stile holding flange and the door panel tends to force the holding edge of the stile holding flange forward, as shown in FIG. 3 (away from the panel door) up over the spur 34; then, due to the resiliency of the stile material, snaps past the locking spur toward the door panel to lock the lug 22*f* to the holding edge. Simultaneously, the lugs 22*e*, 22*g*, at entry into the stile alignment slots, pass into the stile channel until the spurs 32 and 34 pass the alignment slots and snap into place against the edges of the alignment slots closest to the door panel to lock the lugs 22*e*, 22*g* in place. Thus, there is accomplished a wedging and locking action that secures the bracket to the stile while also accomplishing a sturdy interconnection by means of the bracket, between the rail and the stile.

As shown in FIG. 3, the guide 20 carried by the bracket 22 includes a lowermost portion, to be later described, that is situated in a trackway of the threshold 26. It is possible to move the guide along the length of the trackway as the door panel is slid to the left or right in the view of FIG. 3.

Referring now to FIGS. 4–7, the structural features of the guide part 20*a* are shown in detail. The part 20*a*, referred to hereinafter as a guide element, is shown in the view of FIG. 4 with the side thereof that normally faces the door panel being at the front for visual inspection. The guide element 20*a* has a rectangular floor or wall 20*b* and four side walls 20*c*, 20*d*, 20*e*, 20*f* that define a five-sided structure that is open at a sixth side that normally faces the door panel when the guide is utilized in a sliding door installation. The guide element has, as mentioned earlier, a pair of longitudinal exterior shoulders 30 flanking the walls 20*d*, 20*f* and these shoulders are received in the bracket legs 22*h*, 22*i*, 22*j* in the manner shown in FIGS. 2, 3, and 6, so that the guide element can be moved vertically up and down in the bracket 22. A narrow rib 20*g* projecting from the wall 20*b* and extending along the main longitudinal axis of the guide element 20*a* is provided. The rib 20*g* is disposed, when the guide element is assembled with the bracket, so that it rides over the U-shaped slot of the forked leg 38 of the bracket, as is indicated in FIG. 6. The side walls 20*d*, 20*f* have opposed integral stops 20*h* that are disposed to interfere with the forked leg 38 of the bracket that is lowermost, and not visible, in FIG. 3, to limit the vertical distance through which the guide element 20*a* can float or move vertically with respect to the bracket 22. A pair of recesses 20*i* in the wall 20*b* serve no functional purpose except during molding of the part 20*a* which is made of molded plastic.

The guide element 20*a* has a pair of identical, laterally spaced guide legs 20*j* projecting vertically downward from the lowermost wall 20*e*. Each guide leg is slotted, as shown in FIG. 5, so that a guide latch element 40, shown in FIG. 10 may be disposed between

the guide legs. Each guide leg includes a circular slot **20***k* (see FIG. **5**) at one end of an open-ended wedge-shaped slot that converges toward the circular slot. Each leg **20***j* includes a locking recess **201** that faces the locking recess of the other guide leg. FIGS. **5** and **7** illustrate the recess **201** on one of the legs **20***j*. The legs **20***j* are laterally spaced apart by a distance about equal to the width W of the latch element **40**, shown in FIG. **10**.

Referring now to FIG. **10**, the latch element **40** is a body specially shaped to include an integral, non-circular shaft **40***a* with ends **40***b* and **40***c* projecting laterally therefrom. The latch element is placed between the legs **20***j* of the guide element **20***a* by placing the ends **40***b*, **40***c* of the shaft **40***a* into the circular slots **20***k*. The latch element has an integral rearwardly projecting lip **40***d* of width W and also has an integral rear rectangular portion, lip, or hook **40***e* that projects from opposite lateral sides of the latch element. The two lips, **40***d* and **40***e*, define a channel therebetween.

In order to assemble the guide element **20** and the latch element **40** prior to assembling them with the bracket **22**, the shaft ends **40***b*, **40***c* are placed into the circular slots **20***b*, as aforesaid. Then, the latch element is rotated to bring the laterally projecting ends of the lip **40***e* into locked position within the recesses **20***e* of the legs **20***j*. The latch element position thus assumed is that shown in FIG. **8**.

When a framed door panel with guide carrying brackets at its bottom corners is to be installed in a doorway as shown in FIG. **1**, the door is suspended from an upper trackway of the doorway and the guide **20**, including the guide element **20***a* and latch element **40**, is positioned over the threshold trackway **24** as indicated in FIG. **8**. The trackway has opposed longitudinal lips **24***a*, **24***b* defining a trackway slot therebetween. The trackway slot is wider than the guide legs **20***j* so that they may be readily inserted therein.

The lip **40***d* is brought down onto the trackway lip **24***b*, as shown in FIG. **8**, causing the lip to rotate the latch element **40** counterclockwise about the axis of the shaft **40***a*. The lateral ends of the lip **40**e move out of the recesses **201** to the position shown in FIG. **8**, thus causing the lip **40***e* to position itself vertically beneath the trackway lip **24***b*. The trackway lip **24***b* thus becomes engaged in the channel between the latch element lips **40***d* and **40***e*. The lateral ends of the lip **40***e* lock against the rear edges of the guide element legs **20***j*, so that the latch element **40** cannot be inadvertently derotated from its FIG. **9** position. As a result, the latch element latches the guide to the trackway to secure the framed door panel in place over the trackway. The door installation is thus completed.

When it is desired to remove the door from the doorway, the tip of a screwdriver S, represented by dashed lines in FIG. **9**, can be inserted between the guide element wall **20***e* and the latch element lip **40***d*. The screwdriver is then rotated counterclockwise, while using the wall **20***e* as a fulcrum, to pry the latch element **40** loose from its FIG. **9** position and to rotate the latch element **40** clockwise back to its FIG. **8** position, whereupon it is possible to lift the door upward to remove the lowermost end of the guide from the trackway.

Although an exemplary embodiment of the invention has been disclosed herein for purposes of illustration, it will be understood that various changes, modifications, and substitutes may be made by one skilled in the art without departing from the spirit of the invention as defined by the claims which follow.

I claim:

1. A guide adapted to be assembled with a panel or the like and utilized to guide the panel or the like in a predetermined path over an elongated trackway having a two sided trackway slot with a longitudinal slot lip, the guide comprising: a guide element having a base portion two laterally spaced guide legs arranged in parallel spaced relation to each other that extend downwardly from said base portion; said legs being of a width less than the width of the trackway slot whereby said legs may be inserted into said trackway slot so that said legs are spaced longitudenally within said trackway slot; a latch element rotatably mounted between said legs so as to be rotatable about a rotation axis along which said legs are laterally spaced; said latch element including vertically spaced apart lips forming a channel therebetween on one side of said latch element; said latch element being rotatable between said legs from a first rotational position permitting insertion of said legs into said trackway slot to a second rotational position wherein said lips encompass said trackway lip in said channel of said latch element to operatively engage said guide to said trackway and to prohibit inadvertent removal of said guide legs from said trackway slot.

2. The guide set forth in claim **1** wherein said legs and said latch element include means for releaseably locking said latch element in either said first or said second rotational positions.

3. The guide set forth in claim **2** wherein said means for releaseably locking said latch element in either said first or second rotational positions includes lateral projections on said latch element which are releaseably engageable with recesses formed on said legs to releaseably lock said latch element in said first rotational position.

4. The guide set forth in claim **2** wherein said means for releaseably locking said latch element in either said first or second rotational positions includes lateral projections on said latch element that are positionable against the sides of the legs facing said trackway lip to releaseably lock said latch element in said second rotational position.

5. The guide set forth in claim **1** wherein the upper surface of said latch element is angled to permit rotation of said latch element to said second rotational position wherein said upper surface abuts the said base portion of said guide element.

6. The guide set forth in claim **1** wherein said legs include a respective slot receiving a respective end of a shaft portion of said latch element.

7. The guide set forth in claim **1** wherein the particular latch element lip nearest said base portion of said guide element is shaped to define shoulder surfaces at an upper surface of said latch element.

8. The guide set forth in claim **1** wherein the particular latch element lip nearest said base portion of said guide element is disposed so that upon insertion of said guide legs into said trackway slot said trackway lip is operable upon the lower portion of said particular latch

element lip to rotate said latch element from said first to said second rotational position.

* * * * *