

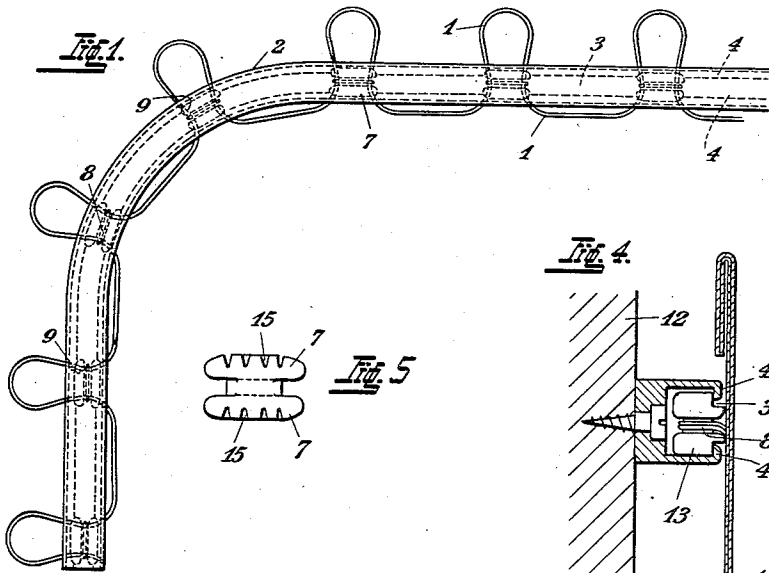
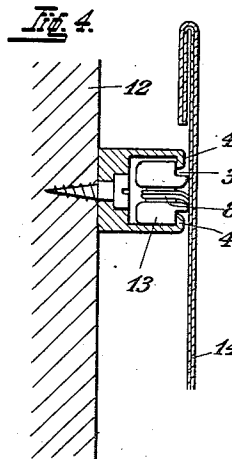
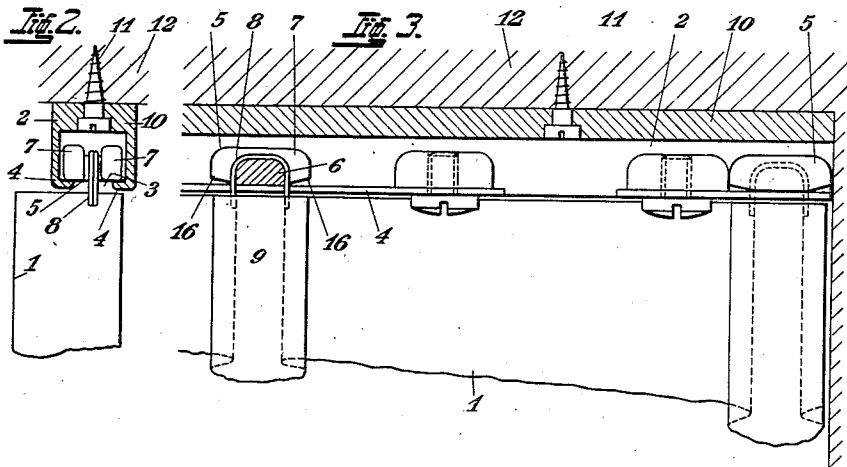
March 25, 1958

A. WEBER
DEVICE FOR SLIDABLY SUPPORTING AND GUIDING
CURTAINS AND THE LIKE

2,827,656

Filed Feb. 10, 1953

2 Sheets-Sheet 1



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his Attys.

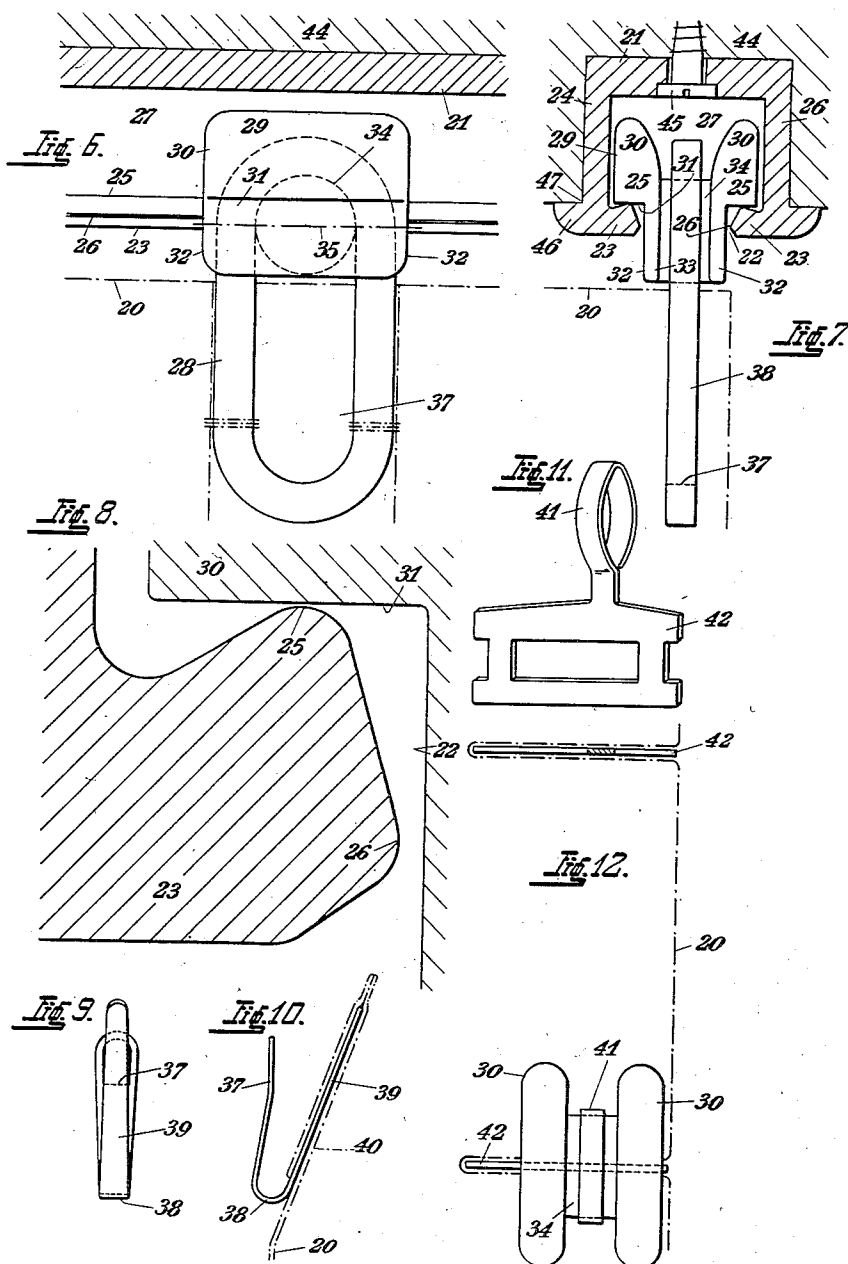
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DEVICE FOR SLIDABLY SUPPORTING AND GUIDING CURTAINS AND THE LIKE

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10 Claims. (Cl. 16—87.4)

The present invention relates to slidable guiding and supporting members adapted to be arranged in a longitudinally slotted hollow rail for supporting and guiding curtains and the like.

The upper end of the curtain is connected at a series of spaced points along its width to a corresponding series of slidable supporting members disposed within the hollow rail. When the slidable members are moved so that they are closely spaced together, the curtain forms a series of folds. The curtain may be readily drawn by sliding the supporting members apart.

The individual connecting members are so shaped that destructive frictional engagement is prevented between the sides of the slot and the connecting means which secures the curtain to the slidable members. This permits the curtain to be connected by means of ordinary threads or the like without danger of wearing or cutting the thread by moving contact between the thread and the edges of the slot.

Each of the connecting members comprises two cheek portions which engage the rail, the cheek portions being interconnected by a load supporting neck portion. The neck portion is rounded to permit free swinging movement of the connecting means about an axis located outwardly of the inner surfaces of the rail flanges, so that tilting of the slidable members is avoided during opening or closing movement of the curtain by the customary flinging operation.

Advantageously, the inner surfaces of the rail flanges are provided with continuous longitudinally extending friction reducing formations having rounded crests which provide substantially line contact with flat sliding load supporting surfaces of the slidable members. Similar friction reducing formations also extend along the confronting edges of the slot.

By way of example several embodiments of the invention are shown in the drawings accompanying and forming part of this specification, in which drawings:

Fig. 1 is a top view of a supporting and guiding rail with a curtain suspended therefrom;

Fig. 2 is a transverse cross section of the arrangement shown in Fig. 1 on an enlarged scale;

Fig. 3 is a longitudinal section corresponding to Fig. 2;

Fig. 4 is a cross section of an alternative modification;

Fig. 5 is a bottom view of the sliding surface of the slide or slipper;

Fig. 6 is a longitudinal section of a second embodiment of the invention;

Fig. 7 is a cross section corresponding to Fig. 6;

Fig. 8 is a detail of the rail and slide or slipper on an enlarged scale and in transverse cross section; and

Figs. 9 to 12 are alternative modifications of connecting members.

The device according to Figs. 1 to 3 for supporting and guiding a curtain 1 comprises a hollow rail 2 with a longitudinal slot 3 open towards the bottom, said slot 3 being laterally bordered by the ends of the rail flanges 4 which are directed inwardly towards each other, slides

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or slippers 5 resting on the inner slide surfaces of said rail flanges arranged and slidable within the hollow space of the rail 2, the shape of said slides being oblong in the longitudinal direction of the rail and having a load supporting constricted portion 6 disposed in the mean plane passing through the longitudinal slot 3 of the rail. On either side of the constricted portion 6 the slide has two cheeks or inner lateral surfaces 7 between which a flexible connecting member 8 serving as a connection between the curtain 1 and the slide 5 passes over the constricted portion 6, said connecting member 8 consisting of thread, twine, a piece of cord or the like, and the ends of said connecting members being secured to the top edge of the curtain 1 at two spaced points 9 (Figs. 1 and 3) thereby forming folds of the curtain. A number of slides or slippers 5 are distributed equally across the whole width of the curtain. Thus a cord may, by way of example, be sewn on or woven in along the top edge of the curtain, said cord bridging a fold of the curtain at each suspension point intended for a slide. The slides 5, if being slid out the rail, drop easily from the connecting member 8 and can again be engaged in the constricted portion 6 from below and then be slid into the hollow rail in order to support the curtain slidably. The slides 25 may also be sewn to the curtain by means of sewing thread passing around the constricted portion 6. The kind of suspension described permits the connecting member 8 to be made so short that the top edge of the curtains at least approximately comes in contact with the lower edge of the rail. On the other hand the connecting member 8 is prevented from coming into contact with the rail flanges 4 by means of the cheeks 7 of the slides and can effectively oscillate only in the longitudinal direction of the slot 3 of the rail.

The rail 2 has a web or base portion 10 joining the legs of the rail, said web 10 being of greater thickness than the legs, by way of example, of at least twice the thickness. The thickness of this web permits applying counterbored holes for sunk cap screws 11 by means of which the rail can be secured by the web to a structural part serving as supporting means 12. Likewise the longitudinal rail slot 3 is of ample width to allow the cap screws 11 to pass for insertion in the supporting means 12 through the web or base portion 10.

Preferably the rail 2 is formed of metal, such as aluminium, or aluminium alloy, and the slides 5 of a non-metallic material, such as synthetic resin, by which the sliding motion of the slides takes place relatively silently.

In modification shown in Fig. 4, the hollow rail 2 is mounted in a horizontal position but with the longitudinal slot 3 at the side of the supporting means 12, and the side 13 projects between the rail flanges 4 outwardly beyond the slot 3. Thus the connecting member 8 is prevented from contacting the rail flanges. This arrangement of the rail allows the curtain 14 to extend upwardly beyond the rail, stiffening rods not shown being sewn into the curtain, if desired.

The sliding surface of the cheeks 7 of the slides are, according to Fig. 5, advantageously provided with grooves or notches 15 disposed transversely to the longitudinal direction of the rail, said grooves or notches assisting in producing an air cushion between the sliding surface of the slide member and the inner lateral surface of the rail when the curtain is moved rapidly, as by a flinging movement. This air cushion effect also reduces noise as well as friction. The reduction of noise and sliding friction may be further enhanced by terminating the lower flat sliding surfaces of the slidable members with slightly bevelled end surfaces 16 (Fig. 3).

A further feature of the invention, as in the form of construction described above, for example, permits the use of superpolyamidic plastic material such as nylon or

the like in slidable members of small dimensions. By making the slidable members short in the direction of sliding movement, a compactly folded curtain is obtainable and bends of short radius may be used in the guide rail. With earlier forms of construction for slidable members formed of plastic material, comparatively large sliding surfaces were required in order to provide slidable members of sufficiently large dimensions to avoid the effects of cold flow, but when large sliding surfaces are used there is a tendency toward adherence between the slidable members and the guide rail.

The device according to Figs. 6 to 8 has been developed to eliminate this disadvantage and similarly comprises a hollow rail 21 preferably formed of an aluminium alloy for supporting and guiding a curtain 20, said hollow rail 21 being provided with a longitudinal slot 22 open towards the bottom and defined by the uniformly spaced confronting terminal edges of the flanges 23 of the lateral walls 24 of the rail which flanges project towards each other and have each two continuous friction reducing slide surfaces 25 and 26 with convexly curved crests which extend along to the longitudinal direction of the rail. The crested slide surfaces 26 are arranged confronting each other at the narrowest section of the slot 22, whilst the crested slide surfaces 25 face the interior space 27 within the hollow rail 21. Elongated ring-shaped connecting members 28 are sewn uniformly spaced along the top edge of the curtain 20, each of said members 28 engaging a slide 29 of synthetic resin, such as for instance nylon, said slide being guided in the rail 21 by means of the two cheeks 30. For this purpose said slide rests with a lower flat load-supporting surface 31 each on one of the upwardly directed sliding surfaces 25 of the rail and acts with a vertical flat guide surface 32 each provided on the portion 33 of the cheeks 30 extending outwardly through the slot 22 and engaging the inwardly directed sliding surface 26 of the rail. The flat supporting and guide surfaces 31 and 32 each extend transversely of the rail beyond the crested slide surfaces 25 and 26 respectively on either side and may be slightly concave in this transverse direction, instead of being flat, without, however, contacting the rail at any non-convex point and while maintaining substantially line contact with the slidable member 29. In the slot 22 the slide 29 has a slight amount of play between the sliding surfaces 26 of the rail, said play, however, normally not allowing the outer lateral surfaces of the cheeks 30 to come in contact with the side walls 24 of the rail.

The cheeks 30 of the slide are joined to each other by a constricted neck portion 34 of the slide of circular cross-sectional configuration and the axis 35 of which is positioned below the flat horizontal cheek surfaces 31 and parallel thereto in the range of the slot 22 and at right angles to the flat vertical cheek surfaces 32 and thus is disposed transversely with respect to the longitudinal direction of the rail. At their lower ends the cheeks 30 are flush with the cylindrical portion 34, but extend beyond said portion 34 at the top and at both ends in the longitudinal direction of the rail and thus prevent the ring-shaped connecting member 28 from coming into contact with the rail flanges 23. The elongated connecting ring 28 has a sufficiently wide opening 37 to permit, if the slide has been slid off the rail, to be detached from the slide 29 without having to be deformed, and it is pivotable on the cylindrical portion 34 of the slide about its low-lying axis 35 so that the curtain 20 swings on the slides 29 in its direction of displacement and no component of force is set up at the slide tending to lift the slide member from the rail.

In order to obtain a slide of synthetic resin with the best possible sliding characteristics, a polishing medium, such as for instance pumice powder, or a sliding medium, such as for instance china clay, is added to the synthetic resin during its production by the action of which medium the sliding surfaces of the rail are kept smooth.

Instead of using the connecting ring 28 described as a connection between the slide 29 and the curtain 20, the curtain may equally well be sewn directly to the slide by means of sewing threads laid around the cylindrical portion 34, these threads, too, being protected by the cheeks 30 from coming into contact with, and from being damaged by, the rail.

The Figs. 9 and 10 show a connecting member consisting of a strip of sheet material provided with a ring-like closed opening 37 at one end for the detachable engagement with the slide and the remainder being formed into a hook 38 the free end 39 of which is arranged for engagement in suspension pockets 40 provided on the curtain and shown in Fig. 10 by dash-dot lines.

The connecting member shown in Figs. 11 and 12 is provided specially for facilitating the arrangement of decorative folds in the curtain and consists of a stamped piece of sheet material with a strip-shaped hook 41 bent around the cylindrical portion 34 of the slide or slipper 29 and a flat frame 42 arranged thereon which is disposed transversely to the longitudinal direction of the rail. The frame 42 can be inserted between the top ends of the curtain portion forming the fold and be joined to them by sewing. Since the decorators usually keep to a certain ratio, when dividing up the total width of the curtain into the decorative folds and into the running width, as by way of example 1:2, the frame 42 is preferably arranged in such a manner on the hook 41 that it extends in correspondingly proportioned lengths on either side over the longitudinal center plane containing the suspension axis of the hook portion.

As is shown in Fig. 7, the hollow rail can be secured in a groove 43 of a wooden supporting carrier 44 by means of the screws 45 and in this case there are provided at the lower edges of the side walls 24 a pair of flanges 46 which project outwardly in the opposite direction to the rail flanges 23, said flanges 46 covering the outer edges of the groove 47.

As compared with the curtain rolling and sliding devices hitherto known, the device described allows in particular a considerable reduction of the cross-sectional dimensions of the rail section heretofore considered as minimum limits to obtain reliable operation in that, by way of example, the inside width of the hollow rail only measures $\frac{1}{4}$ inch across with a minimum width of the slot of $\frac{1}{4}$ inch, whilst the rail sliding surfaces 25 and 26 can be kept nearly as narrow as a line. The aim also to limit the length of the slide in the longitudinal direction of the rail without loss of guiding stability has been achieved by arranging the guiding surface at the narrowest section of the slot. Contrary to certain apprehensions held up to now, tests have shown that the devices with the dimensions of the rail section and of the slide thus reduced ensure an easy and trouble-free manipulation of the curtain.

What I claim and wish to secure by Letters Patent is:

1. A device of the class described, comprising: an elongated hollow rail of generally rectangular transverse cross-sectional configuration, said rail comprising an inner base portion adapted to be secured to supporting means, a pair of spaced side wall portions extending outwardly from said base portion, and a pair of flange portions extending toward each other from outer portions of said side wall portions, the terminal edges of said flange portions confronting each other and being uniformly spaced apart to define a longitudinal slot in said hollow rail; and a plurality of longitudinally slidable load supporting members disposed within said hollow rail, each of said slidable members comprising a pair of spaced cheek portions interconnected by a neck portion, said neck portion being shaped to have a load connected thereto by connecting means circumferentially movable around and at least partially surrounding said neck, said cheek portions being shaped to define a pair of flat coplanar surfaces in slidable load-supporting engagement with the inner sur-

faces of said rail flange portions at opposite sides of said slot and a pair of spaced lateral guide surfaces extending outwardly through said slot for limiting lateral movement of said slidable member, said cheek portions presenting spaced confronting faces which extend outwardly through said slot from opposite ends of said neck portion together with said guide surfaces, said confronting faces being adapted to prevent contact between said connecting means and said confronting terminal edges of said rail flange portions with said connecting means extending outwardly beyond said rail from said neck portion.

2. A device according to claim 1, wherein said load supporting members are formed of a material having hardness and elasticity characteristics which differ appreciably from those of the material from which said rail is formed, said materials providing mutually engaging sliding surfaces of differing characteristics, whereby the noise accompanying sliding movement of said supporting members along said rail is effectively reduced.

3. A device according to claim 1, further comprising connecting means including an inverted U-shaped portion with the closed end of said U engaging said curved portion of said neck portion, said connecting means comprising spaced outwardly extending leg portions adapted to be connected to the upper portion of a curtain at spaced intervals therealong to provide folds in said curtain, said curtain constituting said load, each of said slidable members being dimensioned in the longitudinal direction of said rail when positioned in the position assumed when in sliding engagement therewith to prevent withdrawal of said slidable member from engagement with said connecting means, and being dimensioned in the outward direction of said rail to permit said withdrawal between said leg portion when said slidable member is rotated through an appreciable angle of the order of 90 degrees with respect to said connecting means with said slidable member and said connecting means both completely withdrawn from said rail.

4. A device according to claim 1, further comprising confronting continuous longitudinally extending formations with convexly curved crests disposed along said terminal edge portions and said inner surfaces of said rail flange portions, said crests providing substantially line contact with said coplanar surfaces and said guide surfaces for reducing sliding friction between said rail and said slidable members.

5. A device of the class described, comprising: an elongated hollow rail of generally rectangular transverse cross-sectional configuration, said rail comprising an inner base portion adapted to be secured to supporting means, a pair of spaced side wall portions extending outwardly from said base portion, and a pair of flange portions extending toward each other from outer portions of said side wall portions, the terminal edges of said flange portions confronting each other and being uniformly spaced apart to define a longitudinal slot in said hollow rail; and a plurality of longitudinally slidable load supporting members disposed within said hollow rail, each of said slidable members comprising a pair of spaced cheek portions interconnected by a neck portion, said cheek portions extending symmetrically longitudinally beyond said neck portion, said neck portion being of curved transverse cross-sectional configuration adapted to have a load connected thereto by connecting means at least partially surrounding said neck, said cheek portions being shaped to define a pair of flat coplanar surfaces in slidable load-supporting engagement with the inner surfaces of said rail flange portions at opposite sides of said slot and a pair of spaced lateral guide surfaces extending outwardly through said slot for limiting lateral movement of said slidable member, the inner surfaces of said rail flange portions comprising continuous longitudinally extending formations with convexly curved crests which engage said coplanar surfaces with substantially line contact for

reducing the sliding friction of said load-supporting engagement, said cheek portions presenting spaced confronting faces which extend outwardly through said slot from opposite ends of said neck portion together with said guide surfaces, said confronting faces being adapted to prevent contact between said connecting means and said confronting terminal edges of said rail flange portions with said connecting means extending outwardly beyond said rail from said neck portion, said curved configuration of said neck portion permitting a swinging movement of said connecting means about an axis extending between said cheek portions and located outwardly of said inner surfaces of said rail flange portions, whereby said connecting means may swing without tilting said slidable members.

6. A device according to claim 5, in which said neck portion is of circular transverse cross-section with its center on said axis.

7. For use with an elongated hollow rail of generally rectangular transverse cross-sectional configuration, said rail comprising an inner base portion adapted to be secured to supporting means, a pair of spaced side wall portions extending outwardly from said base portion, and a pair of flange portions extending toward each other from outer portions of said side wall portions, the terminal edges of said flange portions confronting each other and being uniformly spaced apart to define a longitudinal slot in said hollow rail, a slidable load supporting member adapted to be longitudinally movably disposed within said rail, said slidable member comprising: a pair of spaced cheek portions interconnected by a neck portion of curved cross-sectional configuration, said neck portion being adapted to have a load connected thereto by connecting means at least partially surrounding said neck circumferentially movable therearound, said cheek portions being shaped to define a pair of flat coplanar surfaces adapted for sliding load-supporting engagement with the inner surfaces of said rail flange portions at opposite sides of said slot and a pair of spaced lateral guide surfaces extending outwardly through said slot for limiting lateral movement of said slidable member, said cheek portions presenting spaced confronting faces which extend outwardly through said slot from opposite ends of said neck portion together with said guide surfaces, said confronting faces being adapted to prevent contact between said connecting means and said confronting terminal edges of said rail flange portions with said connecting means extending outwardly beyond said rail from said neck portion.

8. A slidable member according to claim 7, in which said cheek portions extend symmetrically longitudinally beyond said neck portion and wherein said neck portion is of curved transverse cross-sectional configuration permitting a swinging movement of said connecting means about an axis extending between said cheek portions and located outwardly of said inner surfaces of said rail flange portions, whereby said connecting means may swing without tilting said slidable members.

9. A slidable member according to claim 8, in which said neck portion is of circular transverse cross-section with its center on said axis.

10. In combination with a slidable member according to claim 7, the provision of connecting means comprising an inverted U-shaped portion with the closed end of said U engaging said curved portion of said neck portion, said connecting means comprising spaced outwardly extending leg portions adapted to be connected to the upper portion of a curtain at spaced intervals therealong to provide folds in said curtain, said curtain constituting said load, said slidable member being dimensioned in the longitudinal direction of said rail when positioned in the position assumed when in sliding engagement therewith to prevent withdrawal of said slidable member from engagement with said connecting means, and being dimensioned in the outward direction of said rail to permit said

withdrawal between said leg portions when said slidable member is rotated through an appreciable angle of the order of 90 degrees with respect to said connecting means with said slidable member and said connecting means both completely withdrawn from said rail.

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