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3,241,197

MEANS FOR GUIDING MOVABLE WALL PANELS

Filed May 21, 1962

3 Sheets-Sheet 1

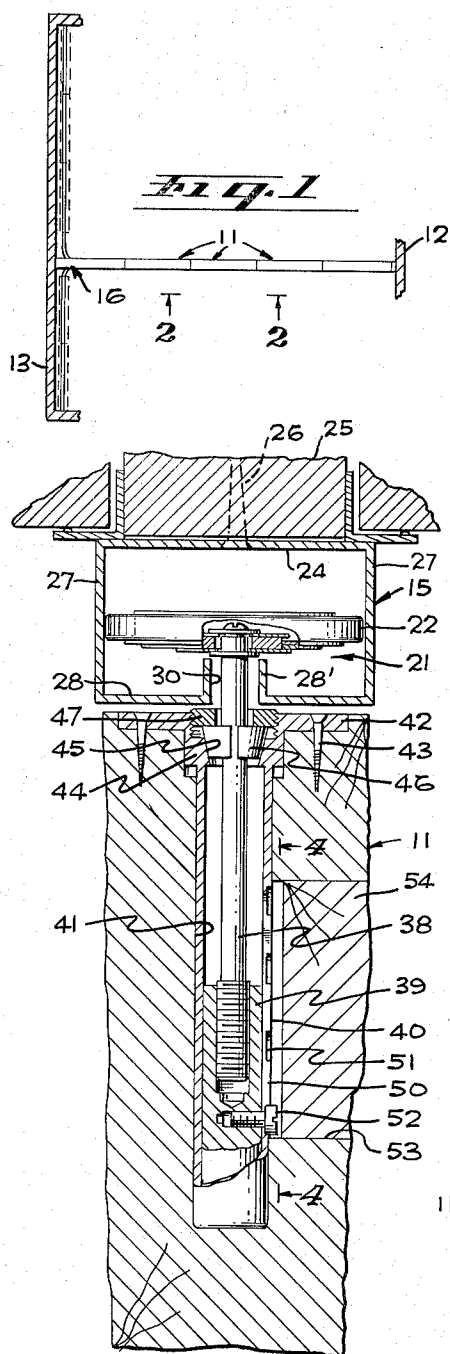


Fig. 1

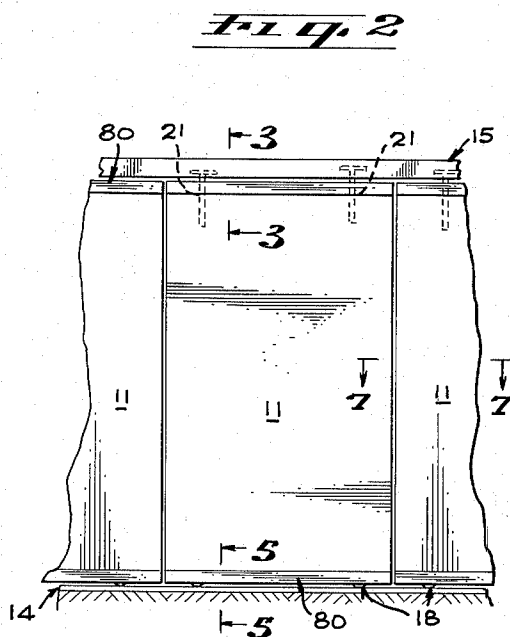


Fig. 2

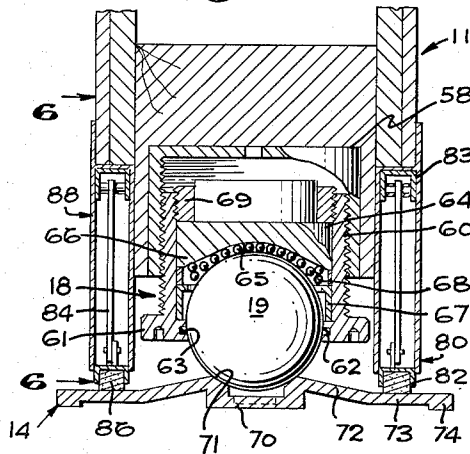


Fig. 3

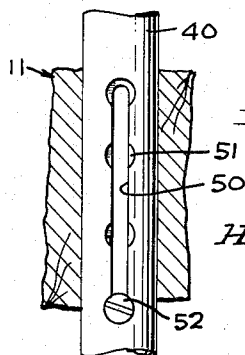


Fig. 4

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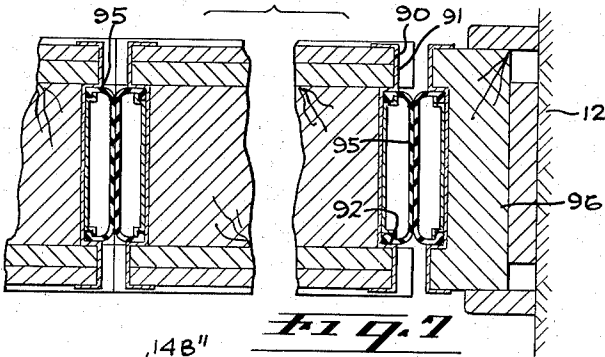
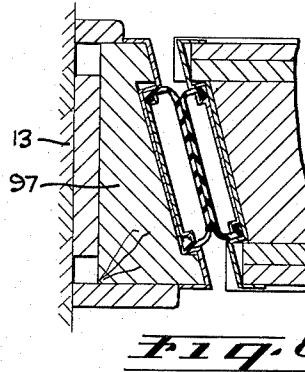
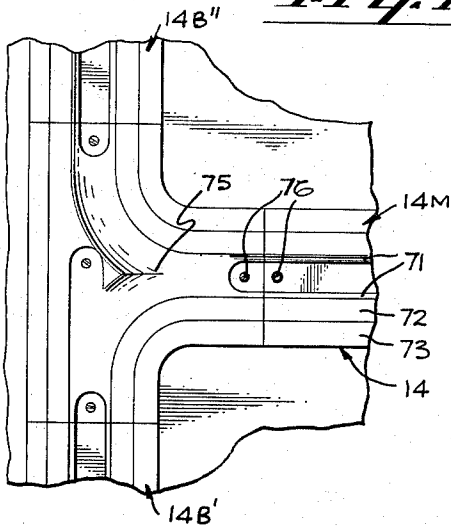
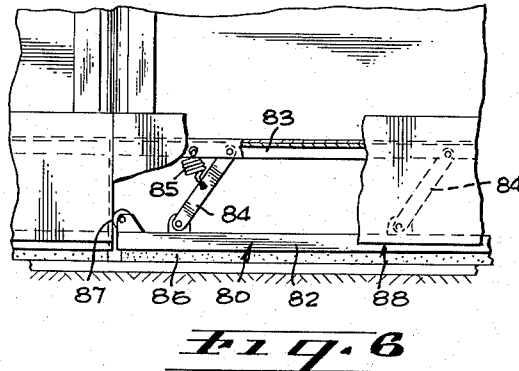


Fig. 11

Fig. 6

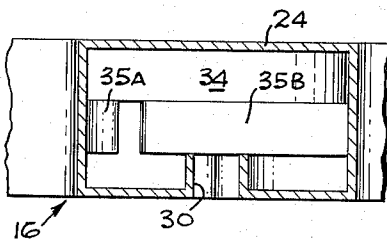
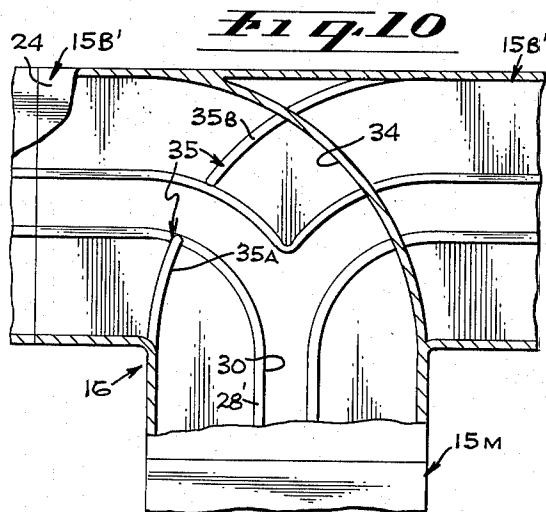


Fig. 9

Fig. 10

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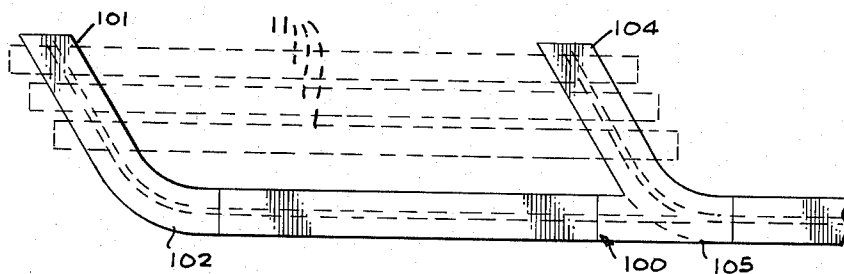


Fig. 13

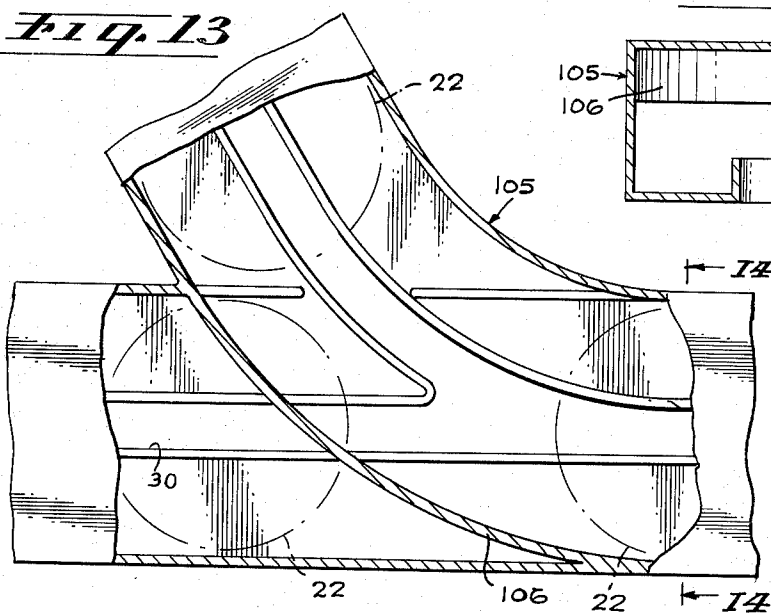


Fig. 14

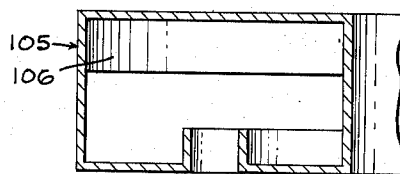


Fig. 15

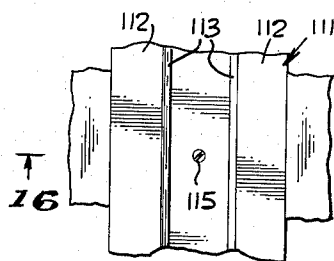
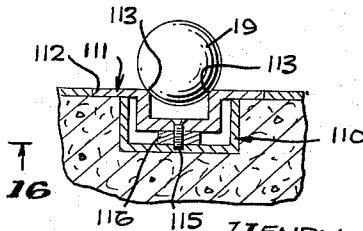


Fig. 16



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MEANS FOR GUIDING MOVABLE WALL PANELS

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2 Claims. (Cl. 20-19)

This invention relates generally to building construction and more particularly to the support and guidance of movable panels and the like and the storage or housing thereof. The application is a continuation-in-part of my copending application, Serial No. 70,321, filed November 18, 1960, now abandoned entitled, "Means for Guiding and Storing Sliding Panels."

Sliding panels are widely used in commercial, office, and school buildings, and to a lesser extent in residences to provide movable partition walls. Large panels, because of their weight and size, present problems of handling and storage. Their weight must be supported and they must be guided at both the top and the bottom for edgewise movement. Conventionally a plurality of parallel tracks are provided in the floor and ceiling or other overhead support with one or more panels on each set of tracks. With such construction the panels, when extended to form a partition wall, cannot be placed in direct edge-to-edge alignment. Furthermore, the multiplicity of tracks are costly and detract from the good appearance of the room.

An object of the invention is to provide novel means for supporting and guiding panels and the like which involves a single main track in the ceiling serving merely for the lateral support of the panels and guidance thereof during movement and a single main track in the floor which carries the weight of the panels, together with alternate novel branch track and diverter means for storing the panels in a side-by-side or edge-to-edge relation, respectively.

Another object is to provide a novel track system for the support and guidance of movable panels incorporating means for guiding the panels, upon movement, into and out of a storage area. In this connection it is an object to provide track means incorporating cam means at given zones for engagement by guide elements on the panels for diverting predetermined panels, or certain portions of the panels, to a branch track.

A further object is to provide novel guide elements adapted to be mounted in the upper edge portions of the panels for cooperation with the upper track means and so constructed as to enable them to be vertically adjusted for predetermined alignment with a given vertical zone of the track means.

Still another object is to provide a novel individual panel construction adapted to form a sealed partition or wall when a plurality of panels are moved together in edge-to-edge relation.

These and other objects will be apparent from the drawings and the following description. Referring to the drawings:

FIG. 1 is a plan view, largely diagrammatic, of a portion of a room of a building showing a plurality of movable wall panels in position to serve a partition;

FIG. 2 is a fragmentary elevational view on line 2-2 of FIG. 1 showing one panel and portions of adjacent panels in elevation;

FIG. 3 is a sectional view on line 3-3 of FIG. 2, but on a larger scale;

FIG. 4 is a fragmentary sectional view on line 4-4 of FIG. 3;

FIG. 5 is a sectional view on line 5-5 of FIG. 2, but on a larger scale;

FIG. 6 is a fragmentary elevational view on line 6-6 of FIG. 5;

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FIG. 7 is a fragmentary sectional plan view in the plane of line 7-7 of FIG. 2, but on a larger scale;

FIG. 8 is a view similar to FIG. 7, but at the region of the opposite end of the partition wall;

FIG. 9 is a sectional view on an enlarged scale of the upper track intersection between the main and branch tracks;

FIG. 10 is a plan view, partially broken away, showing the track intersection of FIG. 9;

FIG. 11 is a plan view of the floor track at the point of intersection with the lateral end track;

FIG. 12 is a plan view of another arrangement of track for storing panels;

FIG. 13 is a plan view at the intersection of the branch track of FIG. 12;

FIG. 14 is a cross-sectional view on line 14-14 of FIG. 13;

FIG. 15 is a fragmentary plan view of another type of floor track; and

FIG. 16 is a cross-sectional view on line 16-16 of FIG. 15.

More particularly describing the invention, referring first to FIGS. 1-11, inclusive, in FIG. 1, I show a plurality of movable panels 11 which are disposed in edge-to-edge relation between the walls 12 and 13 of a building, thus serving as a partition. FIG. 1 is largely diagrammatic, however, it is to be understood that the panels are supported upon a floor track 14 and are guided by an upper track 15, and in the particular arrangement shown in FIG. 1 both these tracks, which are in vertical registration, include a main section upon which the panels are disposed in FIG. 1 and two branch sections which intersect at 16 with the main section and provide a region for the storage of the panels along wall 13.

As will appear, the weight of the panels is carried by the floor track 14 and the upper track 15 merely serves to guide the panels and maintain them vertical. Consequently, both the upper track and the overhead support may be lightly constructed. The panels are provided with a pair of spaced roller ball assemblies 18, each of which has a rotatable roller ball 19 which runs on the floor track 14, as best seen in FIG. 5. Vertically above the roller ball assemblies each panel is provided with a pair of spaced guide assemblies 21 each of which includes a guide element or wheel 22 received within the upper track. The panel itself may be of any suitable material and construction.

Referring to the upper track 15, this is preferably substantially tubular and may be made of rectangular tubing, as best shown in FIG. 3. The track includes an upper wall 24 which may be secured to an overhead support 25 in the ceiling or other upper portion of the room by means of screws 26. The track has two side walls 27 and a bottom wall 28, the latter being interrupted by a central slot 30 extending longitudinally of the track and defined in part by flanged or upstanding wall edge portions 28'.

One of the features of the invention is the provision of guide elements extending above the panels which may be adjustably positioned at a selected elevation within the upper track and the provision of diverter means in the track at the intersection of the main track with a branch track for the purpose of diverting guide elements to the branch track provided the elements are at the proper elevation. A diverter means in the track is made to occupy only a portion of the height of the interior of the track so that the guide elements (wheels 22) may be positioned either to engage such diverter means or to freely pass the same.

Referring to FIG. 10, wherein the intersection 16 between the main section of upper track, designated 15M, and the two branch sections, designated 15B' and 15B'',

is shown, it will be seen that slot 30 continues from the main section to the branch sections through a Y-like branch. Within the intersection are two diverter cam means. One of these is formed by an upper curved wall 34 which extends from the side wall of the main section 15M of the track to the far side wall of the branch section 15B'. This diverter cam extends vertically downward only a limited distance from the upper wall 24, as best seen in FIG. 9, and serves to deflect panel guide wheels 22 at the same height from the section 15M to the section 15B'. Located below the zone of wall 34 is the other diverter cam means which comprises an interrupted wall 35 formed by two sections 35A and 35B which curve oppositely to the wall 34 leading from a side wall of the main track to the far side wall of branch track 15B''. The space between the adjacent ends of wall sections 35A and 35B permits passage of the post of such guide wheels as are at a higher elevation.

Referring now to FIGS. 3 and 4, the guide assemblies are shown as comprising a post 38 which carries aforementioned guide wheel 22 at its upper end. The post is threadedly mounted in a bushing or insert 39 which in turn is adjustably mounted in a barrel 40. The latter is received in a bore or cavity 41 provided in the upper marginal region of the panel, and includes ears 42 which are recessed in the panel and anchored by screws 43. The upper end 44 of the barrel has a tapered seat 45 to receive a tapered ring 46 for locking the post at adjusted height by means of a nut 47.

In order to adjust the post the mounting tube is provided with a longitudinal slot 50 and several spaced screw-head-receiving recesses 51. With this arrangement a mounting screw 52, which threads into the insert, may be selectively positioned at one of the recesses to secure the bushing 39. Minor adjustments are made by rotating the post. Access to screw 52 is provided through an opening 53 leading to the edge of the panel. The opening may be closed by a block 54.

It will be apparent that the guide wheels 22 may be adjustably positioned at the desired elevation within the track 15 so as to engage a particular diverter cam means at a track intersection. While the guide wheel of the particular assembly shown can be adjusted to four main positions by means of the screw 52, slot 50 and recesses 51, only two are required for the particular track 15 shown which has but two zones, however, I contemplate the provision of tracks with three or more zones.

As previously indicated, the panels rest upon roller balls 19 and another feature of the invention is the construction thereof. Referring to FIG. 5, I provide a cup-like housing 58 which is internally threaded to receive an externally threaded retainer 60 provided with an end flange 61 which receives a dust ring 62 in a grooved semi-spherical ledge 63. In the retainer is a bearing seat 64 which has a spherical surface 65 opposite and corresponding to that of the roller ball. Outwardly of this, at its periphery, the surface is flared at 66. A spacer sleeve 67 is provided between the end of the retainer and the seat, and ball bearings 68 are placed between the roller ball and the seat. The seat is retained by ring nut 69.

It will be apparent that with this construction the roller ball may be adjusted within the housing and hence vertically of the panel by rotating retainer 60, thereby making it possible to level and adjust the panels.

In FIGS. 5 and 11 I show one form of floor track. This is characterized by a central channel-shaped section 70 with two track surfaces 71 that are preferably formed to be of the same curvature as the roller balls and upon which the latter roll. On each side of the central section the track has an inclined section 72 and outwardly of this a flat section 73 provided with a longitudinal rib 74 on its under surface. The cross-sectional configuration of the center section changes at intersections from rectangular to concave as in the region 75 where the two runways merge. The track is anchored to the floor by

screws 76. In FIG. 11 the intersection of the main section 14M with the two branch sections 14B' and 14B'' is shown, it being located in registration or substantially in registration beneath the corresponding T-shaped intersection of the upper track shown in FIG. 10. In this connection I have found it desirable to have the guide wheels 22 of the panels deflected by the diverter means of the upper track slightly ahead of the roller balls 19 as otherwise there is a tendency for the roller balls to lag slightly. This can be accomplished by having the diverter cam means of the upper track slightly ahead of the curved sections of the lower track at each end of the upper track intersections.

Another feature of the invention is the provision of means for effecting a seal between the panels and the ceiling and floor when the panels are moved together. To accomplish this, each panel at its upper and lower edges is provided with a pair of seals 80, as shown in FIGS. 5 and 6 which illustrate the lower seals, the upper seals being the same, only inverted. Each seal includes spaced parallel members 82 and 83 connected by pivoted links 84 and springs 85 serving to retract the assembly. The outer member 82 carries a seal strip 86 adapted to contact the floor (or ceiling). At their ends the members 82 are provided with rollers 87 projecting beyond the edge of the panel adapted to be engaged by an adjacent panel to urge the seals to expanded position. A housing 88 contains the assembly.

Also it is desirable to seal the adjacent edges of the panels. For this purpose the vertical side edges of the panels are recessed at 90 and fitted with metal nosing strips 91 having a pair of recessed channels 92 receiving marginal beaded portions of a flexible plastic seal 95. A similar seal may be provided on a jamb 96 on the wall 12 as shown in FIG. 7. Also, on wall 13, a beveled jamb 97 and seal is provided for contact by the adjacent end of the last panel, also beveled at such edge.

Referring now to FIGS. 12-14, I show an alternate manner of storing the panels wherein a main upper track 100 terminates in an inclined end portion 101 connected by a curved section 102 and wherein a branch track section 104 is connected by a switch or intersection 105. In this form of the invention the panels are moved down into the end section and branch track to be stored in parallel relation as shown in broken lines, there being floor tracks below those shown.

The switch or intersection 105 has an upper diverter cam wall 106 leading from the outside of the main track to the corresponding wall of the branch track. This wall is of limited height so that it will only divert panels or portions thereof having a guide wheel at the same elevation. Thus by having the leading guide wheel of each panel at an elevation below this diverter cam wall, the wheel may pass through the switch intersection into the end section 101 of the main track and by having the other guide wheel at the elevation of the wall 106 that particular wheel will be diverted into the switch track.

In FIGS. 15 and 16 I show a form of recessed floor track which includes a pair of channels 110 and 111. Channel 110 is mounted in the floor and can be conveniently installed at the time the floor is poured, should the same be of concrete. The other channel is received within the first channel and has laterally extending flanges 112 extending therebeyond. Two beveled surfaces 113 act as a roller ball runway or track. Preferably these are curved about the same radius as the roller balls. Screws 115 and shims 116 serve to secure the channel 111.

Although I have illustrated and described preferred forms of my invention, I contemplate that various changes and modifications can be made therein without departing from the invention, the scope of which is indicated by the following claims.

I claim:

1. A guide track for upright panels having guide rollers mounted on posts projecting upwardly from the upper

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edges of the panels, the guide rollers being adapted to be at different elevations, comprising a main track member adapted to be secured to an overhead support and having a box-like cross-sectional shape interrupted by a longitudinal slot extending centrally of the lower wall of the track member, a branch track member extending laterally from said main track member and corresponding thereto in cross-sectional shape, said main track member being open to said branch track member and having a branch slot as a continuation of the slot of said branch track member, a curved diverter cam element extending from the side wall of said main track member farthest from said branch track member to the farthest wall of said branch track member, said cam element being of a height substantially less than the height of the track element whereby to leave an uninterrupted passage space of substantial height, said diverter cam element being interrupted in the region vertically above the track slot to permit of the passage therethrough of the posts carrying guide rollers at an elevation above said cam element.

2. A guide track for upright panels having guide rollers mounted on posts projecting upwardly from the upper edges of the panels, the guide rollers being adapted to be at different elevations, comprising a main track member adapted to be secured to an overhead support and having a box-like cross-sectional shape interrupted by a longitudinal slot extending centrally of the lower wall of the track member, a pair of branch track members extending laterally from said main track member in opposite directions and corresponding thereto in cross-sectional shape, said main track member being open to said branch track members and having branch slots as a continuation of the slots of said branch track members, a curved diverter cam element extending from the side wall of said main track member farthest from one of said

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branch track members to the farthest wall of said one branch track member, said cam element being of a height substantially less than the height of the track element whereby to leave an uninterrupted passage space of substantial height and being interrupted in the region vertically above the track slot leading to the other of said branch tracks, and a curved diverter cam element extending from the side wall of said main track member farthest from the other of said branch track members to the farthest wall of said other branch track member at an elevation above said first-mentioned interrupted diverter cam element.

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