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G. B. KURTZON
SLIDING DOOR SUPPORT
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2,527,740

Fig. 1

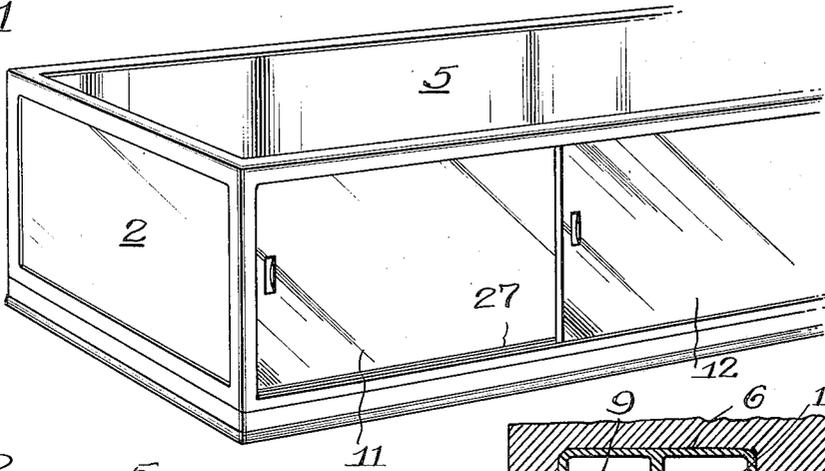


Fig. 2

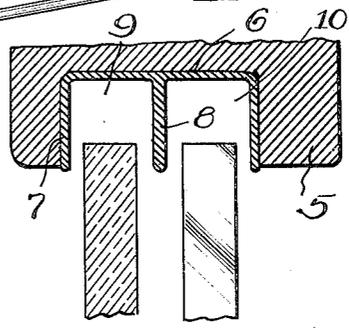
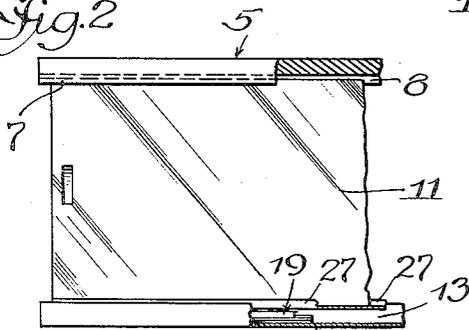


Fig. 3

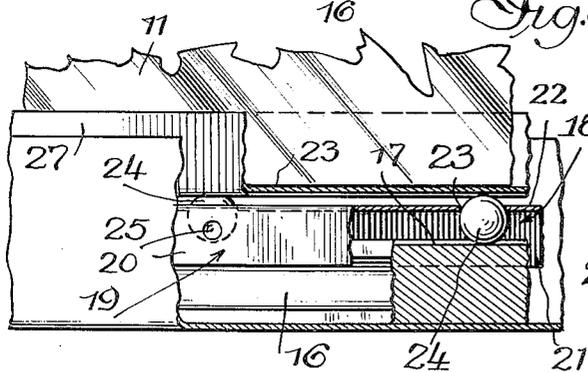


Fig. 4

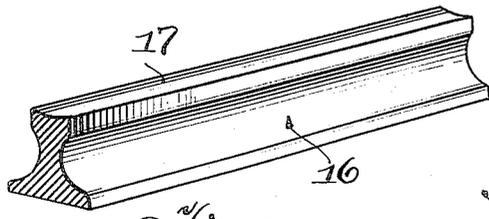
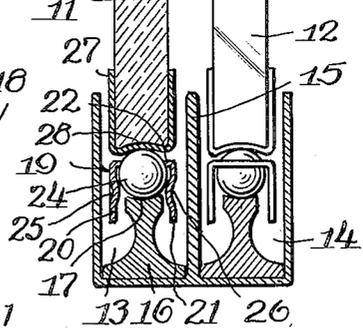


Fig. 5

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SLIDING DOOR SUPPORT

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2 Claims. (Cl. 16—88)

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This invention relates to a sliding door support, and particularly to means for supporting anti-friction bearings commonly positioned under sliding glass doors of the type ordinarily used in show cases and similar cabinets.

In structures of this type it is customary to provide a ball race or track on which a plurality of ganged balls is supported in longitudinally spaced relationship in a ball retainer. A structure of this type is shown in my prior Patent No. 2,061,279. A disadvantage inherent in this type of structure is the tendency of the walls of the ball retainer and the channel or race supporting it to spread under load. This deformation interferes with the smooth operation of the sliding doors by causing them to bind or rub against the channels in which they operate.

The present invention comprises a ball retainer that cannot become deformed with use, and a solid support therefor, substantially in the form of an I-beam, that will stand up under use for the life of the show case. The ball retainer is provided with depending side walls that extend far enough below the top of the supporting beam so that the ball retainer cannot be displaced. The top of the beam is shaped so that the balls will always remain in proper position for efficient operation of the sliding doors. The longitudinal spacing of the individual balls in the ball retainer is maintained by suitably placed indentations in the depending side walls of the ball retainer channel.

The structure by which the above advantages are attained will be described in the following specification; taken in conjunction with the accompanying drawing, in which:

Figure 1 is a perspective view of the rear of a show case having a pair of laterally sliding doors, showing the environment in which the present invention is utilized;

Fig. 2 is a fragmentary rear elevation of the show case shown in Fig. 1, with parts broken away to show the structure of the door supporting means;

Fig. 3 is an enlarged fragmentary rear elevation of the lower portion of the show case, with parts broken away and the door supporting structure shown in greater detail;

Fig. 4 is a cross sectional view through the door structure showing the door supporting means; and

Fig. 5 is a fragmentary perspective view of the supporting beam.

In the drawings, the reference numeral 2 indicates a show case having a pair of laterally

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sliding doors 11 and 12. The structure of the show case is conventional, except for the door supporting means, and will not be described in detail beyond the description necessary for a complete understanding of the invention.

The rear edge of the top 5 of show case 2 (or the front edge or an intermediate portion) is provided with a recess 6 which extends longitudinally across the entire length of the show case. An inverted U-shaped channel 7 having a depending central flange 8 extending longitudinally of recess 6, divides the recess into two duplicate channels 9 and 10. Flange 8 may be a separate member secured in channel 7 in any suitable manner, but it is preferably formed integral with channel 7, as shown.

The top of inner door 11 fits into channel 9, and the top of outer door 12 fits into channel 10. These members are shown, in Fig. 4, with exaggerated clearance for the sake of the illustration, but it will be understood that channels 9 and 10 may be lined with felt or some similar material so the tops of sliding doors 11 and 12 may fit into channels 9 and 10 with a fairly snug fit to prevent rattling when the doors are moved. The fit is, however, loose enough to permit sliding without binding.

The rear edge of show case 2 (or the front edge or an intermediate portion of the show case) is provided at the bottom with channel structure duplicating that at the top of the show case. Channels 13 and 14 lie in the same vertical planes as channels 9 and 10, respectively. Flange 15 which separates channels 13 and 14 is similar to flange 8. Channels 13 and 14, and the door supporting structure housed in each, are duplicates, and therefore only one will be described.

The door supporting member 16 is, preferably, in substantially the shape of an I-beam except that its top surface 17 is not as wide as its base and is slightly concave to furnish a more stable base for the ganged balls hereinafter described. The top surface may, however, be flat and it may be as wide as its base. Top surface 17 is disposed centrally of channel 13. The base of beam 16 is of substantially the same width as the width of channel 13 so it will remain in place without any rattling or wobbling when it is positioned in the channel. If desired, it may be formed integrally with the channel, as by a drawing or extruding operation, for example. Supporting member 16 is preferably of substantially the same length as channel 13 although the structure will operate efficiently if member 16 extends only about three

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fourths of the length of channel 13 provided one end of member 16 is secured adjacent the end of channel 13 which normally houses door 11, when the door is in closed position.

Supporting member 16 does not move with the movement of either door 11 or 12, but the ball retainer, described below, does, and it is desirable that member 16 be under the ball retainer, regardless of its position, to prevent any possibility of any of the balls becoming displaced from the ball retainer.

The ball retainer 18 comprises an inverted channel 19 having side walls 20 and 21 depending on either side of supporting member 16. Side walls 20 and 21 depend far enough below top 17 of supporting member 16 so that they cannot be displaced in channel 13. Top wall 22 of channel 19 is provided with a plurality of longitudinally spaced apertures 23. A ball 24, having a larger diameter than the diameter of aperture 23, is positioned in the concave top 17 of supporting member 16 adjacent each aperture 23. Only a portion of each ball 24 extends through each aperture 23 to provide a rolling contact with the bottom of sliding door 11. Side walls 20 and 21 are indented or bent under each ball 24, as indicated at 25 and 26, for example, to retain balls 24 in proper position in the ball retainer and to maintain the proper longitudinal spacing between the balls. The bottom of door 11, resting on balls 24, is preferably encased in a thin metal channel strip 27 to protect the lower edge of the door. Channel member 27 is slightly concave on its bottom, as indicated at 28, to provide a better bearing surface.

Balls 24 roll between concave surfaces 17 and 28 as door 11 is slid in its channel 13. Ball retainer 18 moves with the door, but only about half the distance the door moves, and therefore the lower surfaces of the balls are always supported on surface 17 even if member 16 extends only three fourths of the length of channel 13. Since member 16 is solid it has no thin walls that can be spread apart by the weight of door 11. The length of side walls 20 and 21 prevents angular displacement of ball retainer 18, and side walls 20 and 21 cannot be spread out under load because there is no force acting against either side wall when the doors are slid in their tracks.

If desired, ball retainer 18 may be inverted. In this structure less than half of each ball 24 would project into channel 19 and side walls 20 and 21

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would project above the lower edge of door 11 a distance sufficient to prevent ball retainer 18 from becoming tilted in channel 13.

Although I have described a preferred embodiment of my invention in considerable detail, it will be understood that the description is intended to be illustrative, rather than restrictive, as many details may be modified or changed without departing from the spirit or scope of my invention. Thus, for example, the channel structure at the bottom of the show case or other cabinet may be dispensed with and door supporting member 16 may be set in a grooved recess or channel formed in the base of the cabinet and held in place by screws or the like, if desired. Accordingly, I do not desire to be restricted to the exact structure described, except as limited by the appended claims.

I claim:

1. A door supporting structure comprising a channel, a beam positioned in said channel, the top surface of said beam providing a runway for balls, said runway being at a level substantially above the bottom of the channel, and a ball assembly comprising an inverted channel having a pair of depending side walls and a series of apertures spaced longitudinally along its top, and a plurality of balls each having a portion projecting through one of said apertures, said pair of side walls depending below said balls and said runway on opposite sides thereof to prevent lateral displacement of said assembly relative to said beam, said balls each resting on the top surface of said beam.

2. A door supporting structure as defined in claim 1, and each of said side walls having a portion thereof conforming generally to the contour of the balls.

GEORGE B. KURTZON.

REFERENCES CITED

The following references are of record in the file of this patent:

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1,843,059	Ziehl	Jan. 26, 1932
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