Oct. 10, 1933. L. G. JACOBSON 1,929,977

SLIDING DOOR SUPPORT

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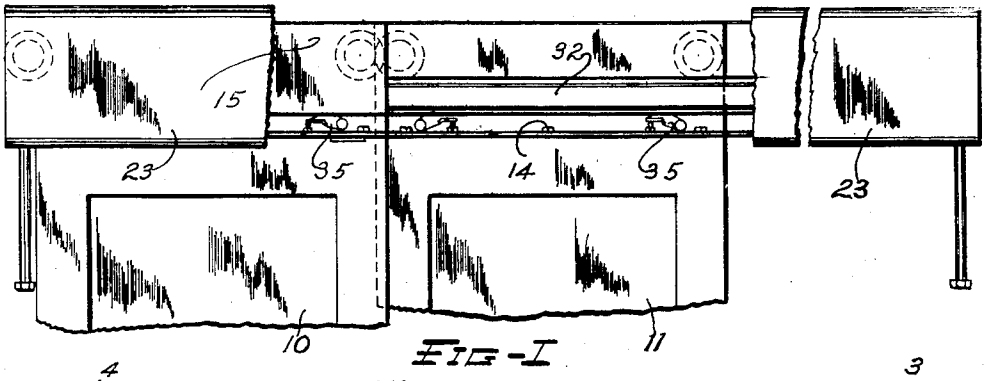


FIG-1

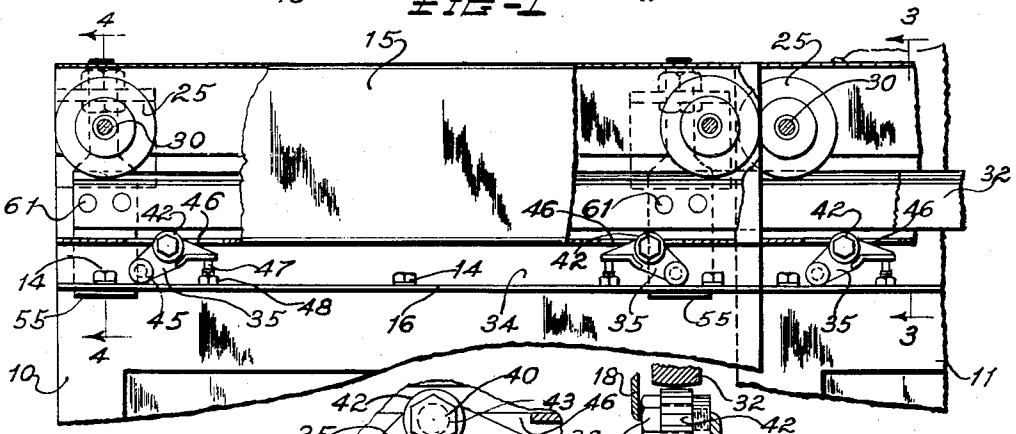


FIG - 2

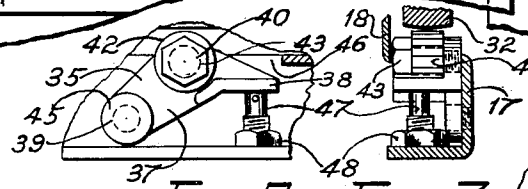


FIG-6

FIG-7

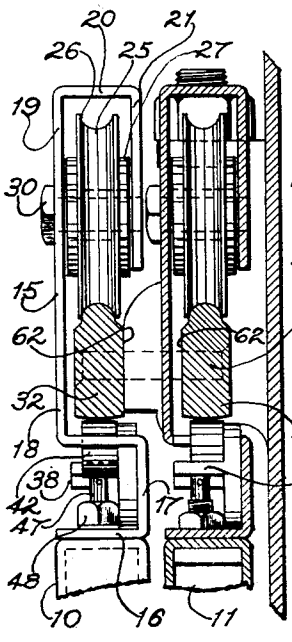


FIG-3

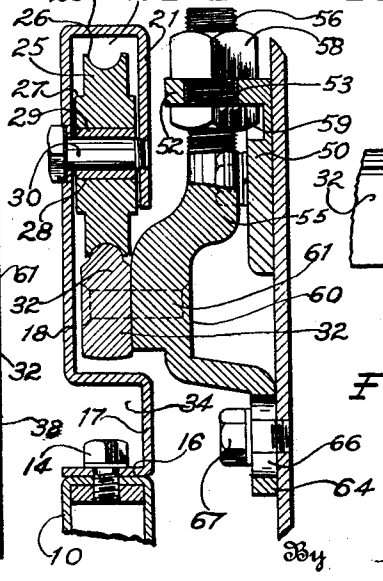


FIG-4

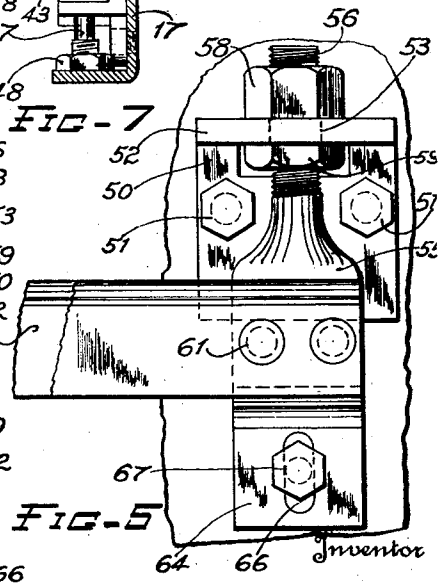


FIG-5

Inventor

Ludwig G. Jacobson

By Clarence A. Walker

His Attorney

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SLIDING DOOR SUPPORT

Ludwig G. Jacobson, Jamestown, N. Y., assignor to Dahlstrom Metallic Door Company, Jamestown, N. Y., a corporation of New York

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7 Claims. (Cl. 16—97)

This invention relates to an improvement in sliding doors and more particularly to doors of the overhead suspension type.

Briefly and in its preferred embodiment this invention constitutes an improved method of supporting sliding doors upon an adjustable track by means of pendent plates and track rollers.

Prior to this invention, it has been customary to suspend sliding doors upon tracks through the use of pendent bolts provided with track rollers. No adequate means has heretofore been provided by which to prevent the rollers from jamming or becoming dislodged from the track when the doors were operated. Furthermore, the tracks by which to suspend the sliding doors have been rigidly secured to the entrance frame thus making it practically impossible to level the track and the doors suspended thereupon. Sliding doors, with the exception of occasional special requirements, are preferred to be suspended in an absolutely horizontal position to preclude inadvertent sliding thereof, to or from opened or closed position. During the erection of a door enclosure or frame errors often occur which, when the track is secured thereto, tends to throw said track slightly out of desired alignment. Furthermore, sliding doors are generally subjected to extremely rough usage particularly those applied to elevators or elevator entrance enclosures. When these doors are moved rapidly from one position to another and strike the stop provided therefore, it is essential that some means prevent the door from jamming or becoming dislodged from the track.

The device shown and described in the following specification not only provides means, by which to level or tilt the track as the occasion may demand, but also provides means by which to retain the door in operative engagement with the track.

One object of this invention is to provide a sliding door which may be removably secured in operative engagement with the track upon which it is suspended.

Another object of this invention is the provision of a sliding door mounted upon a track through the use of a pendent plate and track rollers supported thereby.

A further object of this invention is the provision of a track, upon which to suspend the sliding doors, which may be adjusted into or out of a horizontal plane as desired.

Other and further objects of this invention will appear from a consideration of the following specification taken in conjunction with the accompanying drawing, and in which

Fig. 1 is a fragmentary front elevation of a pair of sliding doors and shows the pendent plates by which said doors are mounted upon their respective tracks;

Fig. 2 is an enlarged view of a portion of the structure shown in Fig. 1, parts of the pendent plate being broken away to better illustrate the manner of supporting said pendent plate upon the track through the use of track rollers;

Fig. 3 is an enlarged vertical sectional view taken on the line 3—3 of Fig. 2 and illustrates details of the pendent plate structure as well as the method of securing the track rollers upon the tracks;

Fig. 4 is an enlarged vertical sectional view taken on the line 4—4 of Fig. 2 and illustrates the manner of supporting the tracks upon the enclosure frame;

Fig. 5 is an enlarged fragmentary front elevation of one of the adjustable supports for the tracks;

Fig. 6 is an enlarged slide elevation of the locking or back kick roller and its attendant mechanism through which the track roller is prevented from becoming dislodged from the rail; and

Fig. 7 is an end view of the structure shown in Fig. 6.

Referring to the drawing, this invention is shown for use in conjunction with a pair of sliding doors 10 and 11. Secured to the doors along the upper edge thereof are pendent plates 15. Inasmuch as the structure of the doors is identical, description of but one will be presented herewith. The pendent plate 15, along the base flange 16, is secured to the door by means of cap screws 14. The flange 16, being substantially the depth of the door, is bent upwardly to provide a vertical wall 17. A sufficient distance above the flange 16, facilitates the insertion or removal of the stud 14. The wall 17 is flanged outwardly and thence upwardly to form the vertical wall 18. Attention is called to the fact that the wall 17 is flush with one vertical edge of the door and the wall 18 is flush with the other vertical edge. The wall 18 of the pendent plate continues upwardly for some distance and is bent inwardly and downwardly to provide a pocket 19 which may be defined by the wall 18, flanges 20 and 21. The pendent plate 15, as may be readily understood, is, when formed as above described, of a depth equal to that of the door to which it is secured and extends the full width of said door. Through the use of this plate, the door is rigidly supported

and in a manner such that the track rollers, track and other supporting elements, are wholly concealed. As shown in Fig. 1 of the drawing, the jointure of the pendent plate to the door may be wholly concealed through the use of a removable door frame cover plate 23. This view also brings out the fact that the cover plate 23 is not necessarily needed to cover up the structural elements of the suspension.

In Figs. 3 and 4 of the drawing, the pendent plate 15 is shown supporting the doors by means of track rollers 25. The rollers 25 are each provided with a concave engaging surface 26 and spacing shoulder 27. An opening 28 is drilled through each roller and a suitable bushing 29 fitted therein. The wall 18 and flange 21 of the pendent plate are drilled to provide passage therethrough for the bolt 30 upon which the roller 25 is mounted. The opening in the flange 21 is tapped to provide threaded engagement for the bolt 30. The flanges 27 formed integral with the roller 25 act as spacers to insure clearance between the wall 18 of the pendent plate and the track 32. The tracks 32 are each provided with convex upper edges which engage the concave surface 26 of each of the rollers 25. Attention is called to the fact that in order to mount the rollers 25 upon the track 32, the pendent plate and rollers must be raised to a position above the track and dropped into place thereon. The purpose of this will be subsequently brought out.

The structure of the lower horizontal portion of the pendent plate 15 is such as to provide a horizontal channel shaped pocket 34. Within the pocket 34 adjacent the ends thereof are located roller locking members 35. These members each comprise an arm 37 having a flange 38 extending at right angles thereto and adjacent one end. The end remote from the flange 38 is provided with an opening 39 therethrough. Midway between the flange 38 and opening 39, a second opening 40 is provided being tapped for a purpose about to be described. A roller 42 having an opening therethrough is vertically mounted upon the member 37 by means of a screw 43 which engages the threaded opening 40. The member 35 is mounted upon the vertical wall 17 of the pendent plate 15 by means of a rivet 45. The outwardly extending horizontal flange which joins the vertical walls 17 and 18 of the pendent plate is cut away to provide slots 46 directly over each of the securing members 35. Directly beneath the flange 38 of the member 35 and mounted in the flange 16 of the pendent plate is a set screw 47 having a lock nut 48 thereupon. The purpose of the screw 47 is to move the securing member 35 upwardly in a pivotal manner about the rivet 45 to a position such that the edge of the roller 42 engages the underface of the track 32. When the set screw has been moved to engage the roller with the track the lock nut 48 is turned to prevent any vertical movement of the roller. It is to be noted that when the roller 25 is in engagement with the convex upper surface of the track and the roller 42 engages the underface of said track, it is impossible for the door to become inadvertently dislodged from said track due to any kick back which may occur when the door is moved to opened or closed position and strikes the stop determining either of these positions.

Reference is now had to Figs. 4 and 5 in which the method of supporting the tracks 32 is shown. Angle brackets 50 are secured to the enclosure frame by means of studs 51. Each of these brackets is provided with a horizontal outwardly extending flange 52 having an opening 53 therethrough. A track suspension bolt 55 having a threaded upper end 56 is passed through the opening 53 of the flange 52 and held in place thereon by means of a nut 58 and lock nut 59. The suspension bolt 55 is bent outwardly and downwardly to provide a substantial rail engaging portion 60. This portion of the bolt 55 is flattened to produce vertical faces 62 to which the tracks 32 are secured, one on each side thereof, by means of a rivet 61. Each track 32 is provided with openings therethrough whereby to receive the rivets 61, said openings being countersunk in order that the rivet may not project beyond the vertical edge of the track. Beneath the faces 62, the bolt 55, being reduced in thickness, is curved inwardly and terminates in a downwardly extending flange 64 which is substantially in line with the vertical flange of the bracket 50. The vertical slot 66 is cut centrally of the flange 64 and a cap screw 67 is passed therethrough to threadably engage the enclosure frame.

Attention is called to the fact that the track suspension bolts 55 are so constructed that they insure uniform spacing of the tracks throughout their length. Referring to Fig. 5 it may readily be seen that should this end of the track be slightly higher than desired, the error can be remedied by loosening the lock nut 59, the cap screw 67 and drawing down on the nut 58. When the track has been raised by this means to the proper level, the lock nut 59 and cap screw 67 are turned down to securely lock the bolt in position. By reason of this structure the tracks 32 are susceptible of micrometer adjustment to facilitate smooth and even operation of the doors.

When it is desired to assemble a device embodying this invention the following steps are to be observed: The brackets 50 are suitably located upon the enclosure frame by means of studs 51. The suspension bolts 55 with the tracks 32 secured thereto may now be suspended from the flanges 52 of the brackets 50. The studs 67 and nuts 58 and 59 being turned down to temporarily secure the bolts and tracks in place. The pendent plates 15 having previously been fitted with the track rollers 25 and roller securing members 35 are now mounted upon the tracks 32. When the rollers 25 are in position upon the upper edge of the track the set screws 47, provided in conjunction with each of the members 35, are turned to their uppermost position thus bringing each roller 42 into engagement with the underface of the tracks. The pendent plates having been mounted upon the tracks and locked by the members 35 in operative position, it remains only necessary to secure the doors 10 and 11 along their upper edges to the flanges 16 of the pendent plates 15 by means of studs 14. When the studs 14 have been turned down to the position substantially as shown in Fig. 4, the door and pendent plate become a single unit. If, for any reason, it becomes necessary to dismantle this structure, it may readily be seen that by turning down the set screws 47 and disengaging the rollers 42 from the tracks 32, the doors, including the pendent plates, may be easily removed from the track. If, however, it is desired to replace doors of one kind with those of another, the screws 14 may be removed thus the removal of the doors and replacement thereof is made possible without in any way dismantling the pendent plates or tracks. After having assembled the doors and pendent plates in operative position upon the tracks, it remains only necessary to

properly level the tracks and the structure is complete. The track leveling is acomplished by raising or lowering any one or all of the pendent bolts 55 as above described.

Attention is called to the fact that although, as above stated, it is generally preferred to provide a level track there are circumstances under which a slanted track would be preferred. The structure as described need not be altered in any way for this use, the track adjustment being sufficient to accomplish this result.

It is to be noted that through the use of a door structure as above described, it is possible to exchange one type of door for another without dislodging the entire structure. A further advantage resides in the fact that the entire working structure of the doors is concealed and yet readily accessible should it be necessary to remove the pendent plate and doors from engagement with the tracks.

While only one modification of this invention has been shown and described, applicant does not intend to be limited thereto since it is obvious that other modifications and adaptations may be made without departing from the spirit and scope of this invention as set forth in the following claims.

Having thus set forth my invention what I claim is new and for which I desire protection by Letters Patent is:

1. A pendent plate for supporting a sliding door, flanges defining longitudinally extending pockets in opposite faces of said pendent plate, a roller mounted in one of said pockets and engageable with a track, a securing member mounted in the other of said pockets, said securing member including a roller, and adjustable means for moving said roller through an opening in one of said flanges into engagement with said track.

2. A pendent plate substantially S shaped in cross section, having a bottom flange directly abutting the top of a door, track engaging rollers mounted in said pendent plate, securing means for attaching a door to said pendent plate, said supporting rollers being accessible from one face and said securing means being accessible from the other face of said pendent plate.

3. A pendent plate for supporting a sliding door and having flanges forming longitudinally extending pockets opening into opposite faces of said pendent plate, rollers mounted in one of said pockets and supported on a track, an adjustable track roller securing member mounted in the other of said pockets, said track supported rollers being accessible from one face, and said securing member being accessible for adjustment from the other face of said pendent plate.

4. In a sliding door supporting structure, a door supporting pendent plate, a plurality of angularly directed flanges forming pockets in said plate, access to said pockets being gained from opposite faces of said plate, track rollers mounted in one of said pockets and engageable with a track located within the confines of said pocket, anti-friction track roller securing means, said means being located in the other of said pockets and movable to project through one of the flanges of said plate to engage the under faces of said track whereby to prevent dislodgement of said track rollers from said track.

5. In a sliding door supporting structure, a door supporting pendent plate, a plurality of angularly directed flanges in said plate, said flanges being substantially S-shaped in cross section and providing longitudinally extending pockets, access to said pockets being gained from opposite faces of said plate, track rollers mounted in one of said pockets and engageable with a track, anti-friction track roller securing means, said means being located in the other of said pockets and movable to project through an opening connecting said pockets to engage the lower portion of said track whereby to prevent dislodgement of said track rollers from said track.

6. In a sliding door supporting structure, a door supporting pendent plate, a plurality of angularly directed flanges forming pockets in said plate, access to said pockets being gained from opposite faces of said plate, track rollers mounted in one of said pockets and engageable with a track, track roller securing means, said means being located in the other of said pockets and movable to project through an opening in one of the flanges of said plate to engage the adjacent portion of said track whereby to prevent dislodgement of said track rollers from said track.

7. In a sliding door supporting structure, a door supporting pendent plate, a plurality of angularly directed flanges forming pockets in said plate, access to said pockets being gained from opposite faces of said plate, track rollers mounted in one of said pockets and engageable with a track, track roller securing means, said means being located in the other of said pockets and comprising an arm pivotally joined at one end to said plate, a roller mounted on and located between the ends of said arm, and adjustable means supporting the free ends of said arms, said adjustable means being adapted to move said roller through an opening in one of the flanges in said plate to engage the adjacent portion of said track whereby to prevent dislodgement of said track rollers from said track.

LUDWIG G. JACOBSON.