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ROLLER TRACK APPARATUS

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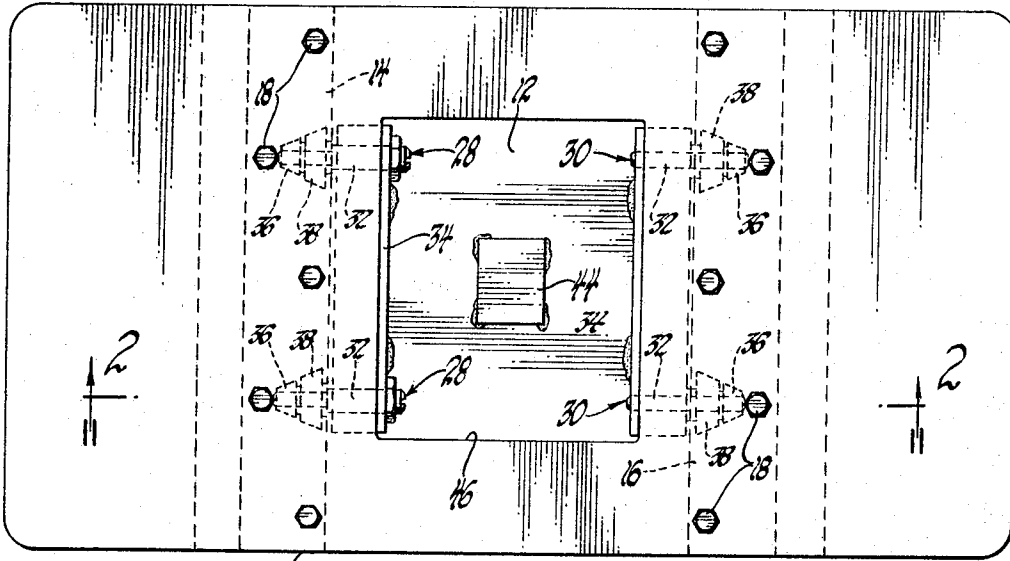


Fig. 1

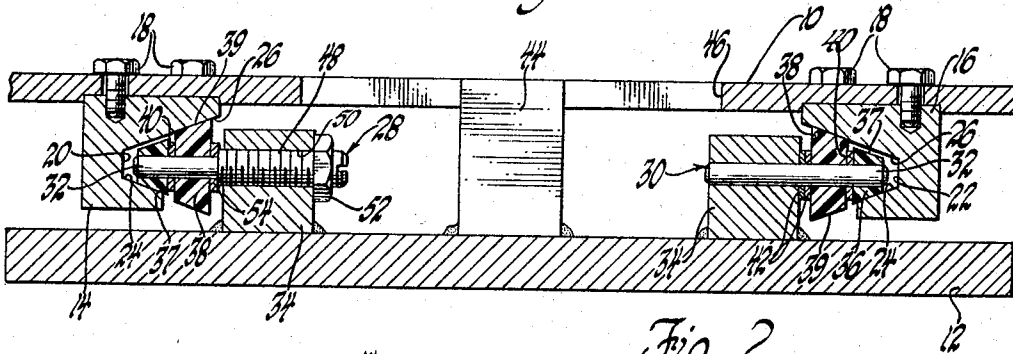


Fig. 2

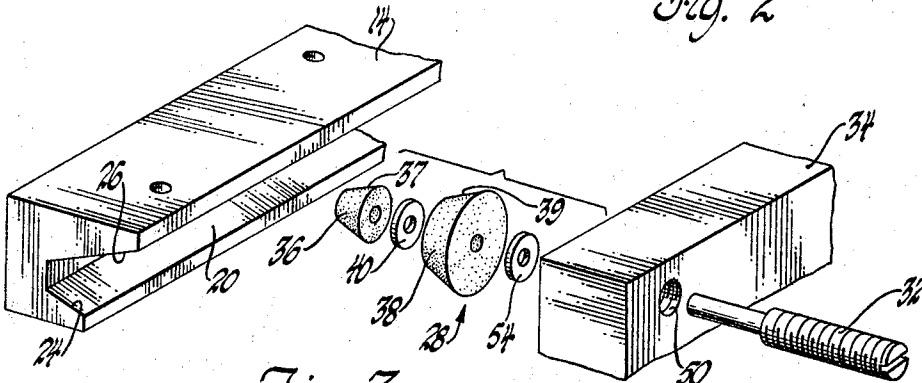


Fig. 3

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ROLLER TRACK APPARATUS

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This invention relates to roller track apparatus and more particularly to tapered roller track apparatus.

Generally, the roller track apparatus of this invention supports a pair of members for movement relative to each other, and includes a pair of roller tracks on one of the members and sets of tapered roller units rotatably mounted on the other member and received within respective roller tracks. Means are also provided for wedgingly engaging the rollers with the tracks to take up lash in directions transverse of the direction of relative movement between the members. In the past, such lash take-up means have been limited to only partial take-up, past which the rollers would tend to bind or skid within the tracks rather than roll thereover. However, the lash take-up means of this invention is operable to fully take up lash between the members but yet will not bind or cause skidding of the rollers, nor in any way restrain the members from their normal relative movement.

The primary object of this invention is to provide new and improved roller track apparatus. Another object of this invention is to provide new and improved roller track apparatus including lash take-up means. A further object of this invention is to provide new and improved roller track apparatus including lash take-up means operable to take up lash without causing binding or skidding between the roller and track elements of the apparatus.

These and other objects and advantages will be readily apparent from the following specification and drawings wherein:

FIGURE 1 is a plan view of roller track apparatus according to this invention;

FIGURE 2 is an enlarged sectional view taken generally along the plane indicated by line 2—2 of FIGURE 1; and

FIGURE 3 is an exploded perspective view.

Referring now to FIGURES 1 and 2, reference characters 10 and 12 indicate a pair of upper and lower members which are to be supported for movement relative to each other. Member 10 has secured thereto by screws 18 a pair of like spaced elongated roller tracks 14 and 16 provided with roller recesses or channels 20 and 22 opening inwardly of member 10. The channels 20 and 22 are of generally frusto-conical or wedge-shaped cross section and include oppositely inclined support or guide surfaces 24 and 26, each upper surface 26 extending inwardly beyond the opposite lower surface 24. Spaced pairs of roller units 28 and 30 are mounted on member 12 adjacent opposite edges thereof and are respectively received in roller tracks 14 and 16.

As seen best in FIGURE 2, each roller unit 30 includes a roller shaft or pin 32 secured in a block 34 which is welded to member 12. Inner and outer rollers 36 and 38 are journaled on shaft 32, with a thrust washer 40 being interposed between rollers 36 and 38, and a pair of thrust washers 42 being interposed between roller 38 and block 34. Roller 38 has a tapered roller surface 39 complementary to surface 26 of the roller track for full rolling engagement therewith, and roller 36 has a tapered roller surface 37 complementary to surface 24 for full rolling engagement therewith. The diameters of rollers 36 and 38 are respectively smaller and larger than the distance between the planes of surfaces 24 and 26 at the locations at which the rollers complementarily engage the respec-

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tive surfaces, and the axes of shafts 32 are somewhat offset from horizontal planes bisecting the respective channels 20 and 22 and, in the embodiment shown, generally parallel to such planes. This, together with the projection of surface 26 beyond surface 24, locates the rollers so that roller 36 engages only surface 24, and roller 38 engages only surface 26.

The roller units 28 are identical to roller units 30 with the exception of lash adjusting means provided in roller units 28, presently to be described, so that all four roller units engage in their respective roller tracks in the above-described manner and rollably support the members 10 and 12 for relative movement in the direction of elongation of the roller tracks. A stop member 44 mounted on member 12 projects into a central aperture 46 of member 10 for engagement with opposite edges of the aperture to limit relative movement between the members.

Lash take-up means for effecting full engagement of the roller surfaces of each roller 36 and 38 of all four roller units provided in each of the roller units 28 include a portion 48 of shaft 32 threadedly received in a tapped bore 50 in block 34 rather than fixed therein as in the roller units 30. A thrust washer 54 is interposed between the shoulder of threaded portion 48 and roller 38.

The inner projecting end of portion 48 is slotted or otherwise adapted for use with a screw driver or other common tool to axially adjust the shaft and the rollers 36 and 38 relative to block 24 so as to fully wedgingly engage the tapered roller surfaces 37 and 39 of each roller unit 28 with the respective roller track support surface. Upon such wedging engagement of the roller units 28, a slight lateral shift of members 10 and 12 will result so that both sets of roller units 28 and 30 are tightly engaged to take up lash in both roller tracks. A nut 52 is threaded on the projecting end of portion 48 to engage block 34 and maintain the selected lash adjustment.

It will be apparent that since each roller of the individual roller units is engageable with only one support surface of the roller track rather than both surfaces thereof, a tight wedging engagement of the roller with that surface to take up lash may be effected without creating the binding frictional couple on opposite sides of the roller that has heretofore been the case. Consequently, the rollers 36 and 38 will always freely roll in the tracks and smooth operation of the apparatus is ensured.

Thus new and improved roller track apparatus is provided.

I claim:

1. The combination comprising, a pair of relatively movable members, an elongated roller track on one of said members having a pair of support surfaces forming a roller channel, said surfaces being formed along intersecting planes inclined oppositely relative to a plane therebetween bisecting said channel, first roller means rotatably mounted on the other of said members within said channel about an axis lying outside said bisecting plane and having a tapered roller surface complementary to one of said support surfaces for full flush rolling engagement exclusively therewith, second roller means rotatably mounted on said other member within said channel coaxially with said first roller means and having a tapered roller surface complementary to the other of said support surfaces for full flush rolling engagement exclusively therewith, and means for axially adjusting said first and second roller means relative to said members to wedgingly engage said first and second roller means with respective support surfaces to provide for nonskid lash take-up between said members.

2. Roller track apparatus as recited in claim 1, wherein said axis is parallel to said bisecting plane, one of said support surfaces extending beyond the other of said support surfaces, and wherein said roller surfaces are discon-

continuously tapered whereby said roller means engage exclusively with the support surface respective to each.

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