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I. R. DISBRO

2,230,744

SUPPORT FOR ELEVATOR DOORS AND THE LIKE

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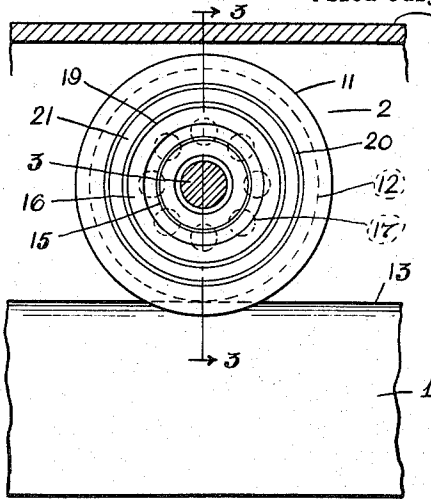


Fig. 1

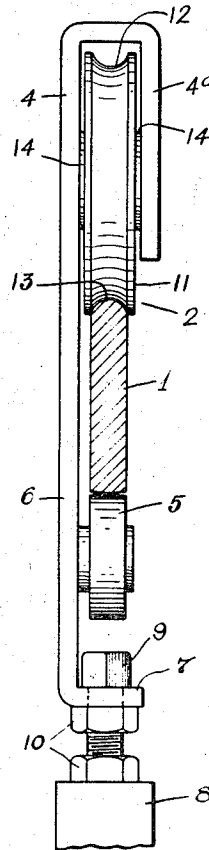


Fig. 2

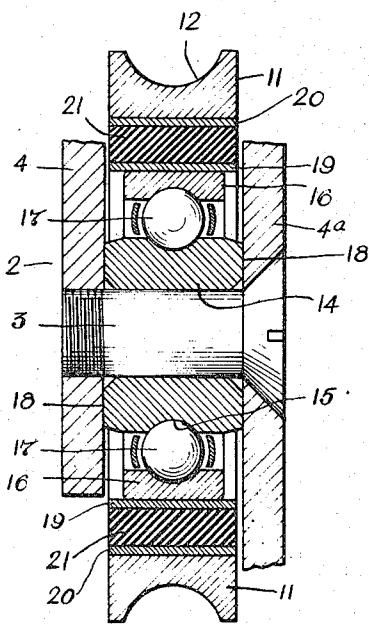


Fig. 3

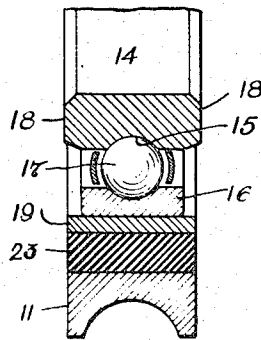


Fig. 4

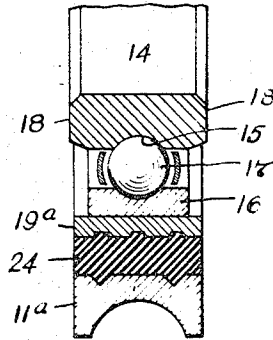


Fig. 5

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SUPPORT FOR ELEVATOR DOORS AND THE LIKE

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1 Claim. (Cl. 16—107)

This invention relates, as indicated, to supports for elevator doors and the like, but has reference more particularly to the provision of an improved sheave for use in such supports. As is well known, the latter, more particularly in the opening and closing of an elevator door, are subject to rather severe impact shocks, with resulting noise and wear.

One principal object of the invention is to provide a sheave of the character described, which will relieve the shock of impact and absorb sound to a large degree, so that the door will be extremely quiet in operation. At the same time, such sheave is of sturdy, long-lived construction. Another object is to design such sheave so that the parts may be readily fabricated and assembled.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claim.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of this invention may be used.

In said annexed drawing—

Fig. 1 is an end elevation showing the improved sheave, together with the supporting hanger, door and track; Fig. 2 is a side elevation of the same; Fig. 3 is a transverse cross-sectional view of the wheel, taken on the line 3—3 of Fig. 1; and Figs. 4 and 5 are partial sectional views, similar to Fig. 3, but illustrating modifications in construction.

Referring to Figs. 1 and 2 of the drawing, there is shown a track or guide 1, upon which is movably mounted a sheave, generally designated by the reference numeral 2, the sheave being mounted for rotation about a stud or shaft 3, which passes through the two parallel sides 4 and 4a of a hanger 6. Mounted on the hanger so as to contact with the under side of the track 1, is a second plain, counter-pressure roller 5. The hanger 6 is provided with a flange 7 at its lower end, to which is adjustably secured a door 8 by means of bolts 9 and nuts 10. The door 8 may be either the door in an elevator car or a door in the elevator frame which encloses the elevator shaft.

In the form of construction shown in Fig. 3, the peripheral portion of the wheel 2 consists of an annular metal rim 11, having a groove 12 in

its outer periphery which is formed to engage over the upper surface 13 of the track 1. Centrally located within such rim is a hub 14 which has preferably, formed integrally therewith, one element of an anti-friction bearing consisting of an inner ball race 15. Surrounding such inner ball race is an outer race 16, with balls 17 therebetween. The hub 14 may be press-fitted on the stud 3, or where the latter, as shown, takes the form of a screw, such hub will be held in fixed position by drawing up such screw so as to clamp the hub between the adjacent portions 4 and 4a of the hanger. The sides 18 of the hub project beyond the inner ball race sufficiently to leave the latter, and the other members of the sheave, lie clear of the hanger.

Interposed between the outer race 16 of the bearing and the inner periphery of the rim 11, is an annular insert of special construction, such insert consisting of spaced metal rings 19 and 20, with an annulus 21 of rubber or other resilient material therebetween. The annulus 21, in the construction of Fig. 3, is placed between the metal rings 19 and 20, so as always to be under compression.

The modified construction illustrated in Fig. 4 is substantially the same as the one just described, except that the annulus 23 of rubber is here interposed directly between the peripherally grooved rim 11 of the sheave and metal ring 19, the latter, as before, being fitted onto the outer ball race 16. As in the previously described construction, the annular rubber layer will be preferably inserted under compression between the two members just referred to.

In the further modified form illustrated in Fig. 5, the annular layer of rubber 24, as in the construction of Fig. 4, is interposed directly between the peripherally grooved rim 11a, which is of special construction, and the inner ring 19a, which is likewise of special construction. As will be noted, both said rim and ball race are formed with circumferential grooves which the rubber layer fills with complementary ribs or projections. In this construction, the rubber will desirably, if not necessarily, be vulcanized in situ, in which case, owing to contraction following the vulcanization, the material in the annulus will be under tension rather than compression.

It will be understood that the rubber may similarly be vulcanized in situ in each of the preceding constructions, although as stated, I prefer to insert it under compression and to leave it in that state.

As a result of the foregoing construction, in each of the several forms described, the sheave is practically noiseless in its operation, although moving on a metal track and subject to considerable impact shock. At the same time, such sheave is extremely sturdy and so correspondingly long-lived in such use. Moreover, the arrangement of the insert between the rim and the anti-friction bearing is of particular advantage, in that such insert is relieved of stresses which would tend to separate the rubber from the metallic parts of such insert.

While in each of the several forms of my improved sheave, hereinbefore described, the sound-deadening or cushioning material is referred to as vulcanized rubber, either prevulcanized and inserted under pressure, or vulcanized in situ, it will be understood that other equivalent non-metallic resilient material may be employed, as for example, layers of wound fabric which may be impregnated with a suitable binder so that the annulus will retain its shape and keep the parts of the sheave in proper alignment. Artificial

rubber-like compounds and other equivalent synthetic materials may also be used to form the insert between the rim and the outer ball race of the sheave.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in the following claim, or the equivalent of such, be employed.

I, therefore, particularly point out and distinctly claim as my invention:

A sheave for supporting elevator doors and the like, said sheave adapted for rolling movement on a track or like support during the opening and closing of said doors, comprising an anti-friction bearing, an annular rim formed to engage said track, and an insert interposed between said bearing and rim, said insert consisting of spaced continuous metallic rings and an annulus of non-metallic, yielding, resilient material between and held by said rings under initial compression radially of said sheave.

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