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R. W. DISBRO
WHEEL CONSTRUCTION
Filed July 10, 1924

1,737,360

Fig. 2.

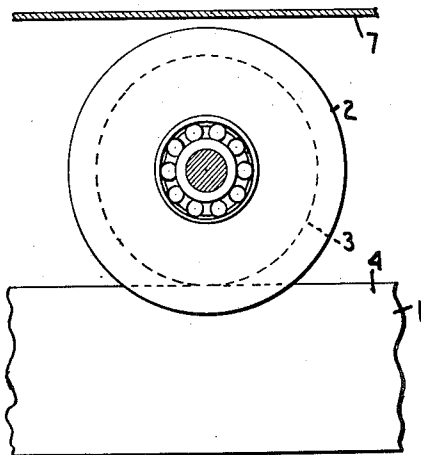


Fig. 1.

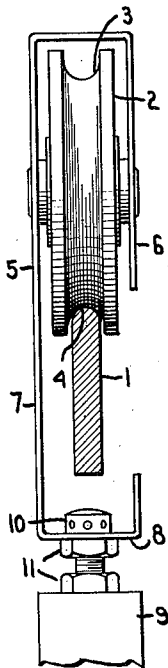


Fig. 3.

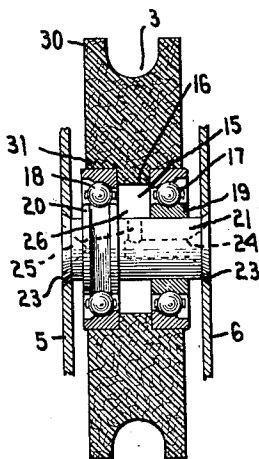
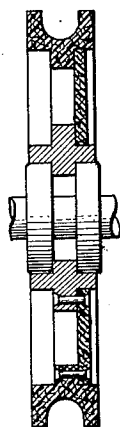


Fig. 4.



INVENTOR.
Roger W. Disbro
BY
Fray, Oberlin & Fray
ATTORNEYS.

UNITED STATES PATENT OFFICE

ROGER W. DISBRO, OF CLEVELAND HEIGHTS, OHIO, ASSIGNOR TO THE W. S. TYLER COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

WHEEL CONSTRUCTION

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The present invention, relating, as indicated, to wheel construction, is more particularly directed to the provision of a wheel for use in supporting the doors in elevator shafts and in elevator cars as well, where quietness of operation and long life of the wheel are the most important considerations. 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 one type of my improved wheel, together with the supporting hanger, door and track; Fig. 2 is a side elevation of the same; Fig. 3 is a longitudinal section through one form of my improved wheel; and Fig. 4 is a similar view showing a modification of my wheel.

Referring now to Figs. 1 and 2 there is shown a track or guide 1, upon which is movably mounted a grooved wheel 2, the wheel being provided with a groove 3 suitably formed to engage over the upper surface 4 of the track. This wheel is mounted in the sides 5 and 6 of a hanger 7, which is provided with a flange 8 at its lower end, to which is adjustably secured a door 9 by means of bolts 10 and nuts 11. It will be understood that the door 9 represents either the door in an elevator car or the door in the elevator frame which encloses the elevator shaft.

Very marked improvement has been made in the last few years in the construction of elevator cars, shafts, doors and other parts, with the result that the present types of elevators are practically noiseless in operation, and it is of course highly desirable that the operation of the doors giving access to the shaft and to the elevator cars should be equally noiseless. In fact, because of the greater silence in the operation of the car itself slight noises which heretofore passed unnoticed in the operation of the doors are now

extremely noticeable and must be avoided. The casing or shaft in which the elevator cars operate, that is the casing which encloses the shaft, and which includes the metal front in which the doors leading to the shafts are supported, is to a large extent a sounding board which magnifies even the slightest noises, and which, in the silence of the elevator shaft, are extremely disagreeable.

Metal wheels, which have been used many years for supporting the doors to the elevator shaft, and which have been operated upon metal tracks, are at present unsatisfactory because of the greater silence and operation of the various other parts which make up the elevator apparatus. After a very extensive investigation into materials and wheels made of the same I have succeeded in making a wheel which is practically noiseless in its operation on a metal track, and is extremely long lived in such use. My improved construction may be either of the forms shown in Figs. 3 or 4, in which the wheel proper is provided with a central aperture 15, into which projects a flange 16, against either side of which flange I mount anti-friction bearings 17 and 18. The inner races 19 and 20 of the bearings 17 and 18 are supported upon a shaft 21 which passes through the two parallel sides 5 and 6 of the bracket 7. This shaft 21 is in the form of a stud which is notched at either end and has its edges 23 expanded outwardly into a close engagement with correspondingly beveled edges on the two plates 5 and 6 which maintain the stud against rotation or endwise movement in the track. In addition, one end of the stud 21 is provided with a longitudinal opening 24 connected with a radial opening 25, through which lubricant may be introduced to the space 26 between the two bearings 17 and 18, and thus both bearings may be well lubricated from this single central opening in the stud.

I have found it essential to construct the web or intermediate portion of the wheel, that is, the portion between the outer edge 30 and the hub portion 31, in which are carried the bearings 17 and 18 of a non-metallic, non-resonant material. This central portion or

web of the wheel may be formed either integral with the outer and inner portions 31, or it may be separate and may be removably secured to the outer and inner portions, as shown in Fig. 4, so long as it is formed of a non-resonant material. In addition it is necessary that the outer portion 30 of the wheel, which is provided with the groove 3 in the form shown to fit over the rounded upper edge of the track 1, be also constructed of a non-resonant material. With a wheel so constructed practically no sound is produced by operation of the wheel over a metallic track, and the life of such a wheel in use on elevator doors is extremely long.

The best material which I have found for this purpose, and the only one which satisfactorily meets all the requirements as to silence and life, consists of a tough fabric, preferably heavy canvas embedded in a product formed from phenol and carbolic acid; the exact composition of which I do not know, but which is a standard product which may be purchased under the trade name of "Mica-carta". It is immaterial whether the fabric in this composition lies in parallel layers or whether the fabric and material are pulped and then cast or molded into the desired shape, so long as this material be used both in the outer rim or track-engaging portion of the wheel and also as an intermediate or web portion of the wheel as I have already explained.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by the following claim or the equivalent of such stated means be employed.

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

A wheel comprising an annular rim portion provided with a circumferential groove, a hub portion, an intermediate portion of non-resonant material connecting said rim and hub portions, said hub portion having concentric annular recesses at its sides, and ball races mounted in said recesses.

Signed by me, this 8th day of July, 1924.

ROGER W. DISBRO.