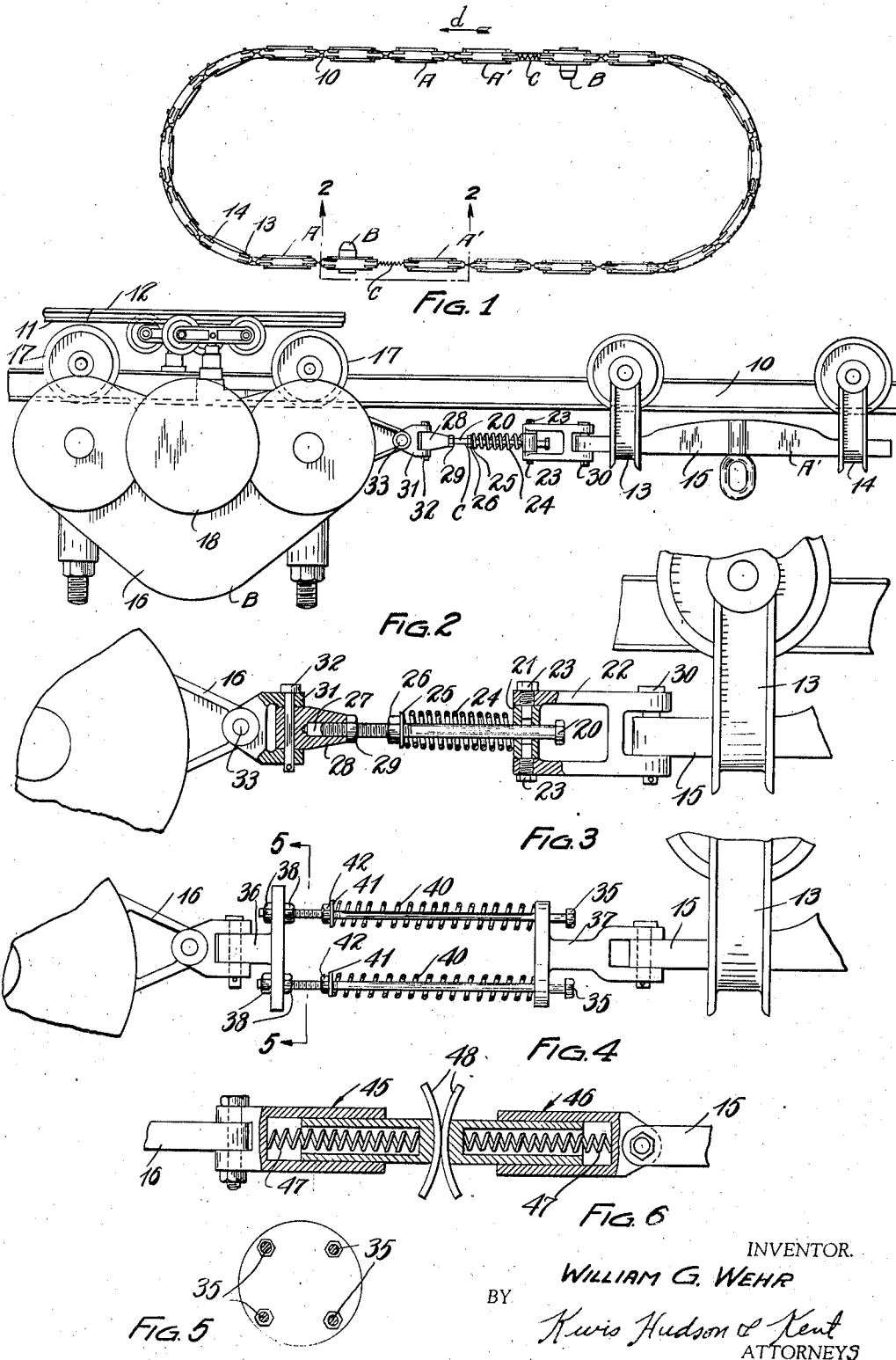


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OVERHEAD CARRIER SYSTEM

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OVERHEAD CARRIER SYSTEM

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The present invention relates to overhead tramrail systems and more particularly to an overhead tramrail system wherein a plurality of cars, a limited number of which comprise tractor or propelling means, arranged in a continuous loop are moved about a continuous rail or track.

Heretofore in the art, when a plurality of carriers connected in a continuous loop were moved about an endless rail or track by tractor or propelling means incorporated in a limited number of said carriers, or by a plurality of tractors interposed between certain of the carriers, a binding action, more or less in the nature of a snubbing action, occurred at the curves of the track. This binding or snubbing action interfered with the free movement of the carriers and necessitated the use of an unwarrantedly large number of tractors, or tractor carriers which greatly increased the cost of such installations and hindered their adoption in industry.

The chief object of the present invention is to reduce the number of cars comprising tractor or propelling means required to move a plurality of cars arranged in a continuous loop about a continuous rail or track.

Another object of the present invention is the provision of novel means, or a novel connector, for connecting the cars of an overhead tramrail system, in which system a plurality of cars arranged in a continuous loop are moved around an endless rail or track by tractor or propelling means embodied in some of the carriers, which means or connector will greatly reduce, if not entirely eliminate, the binding or snubbing action heretofore encountered at the curves of the rail or track.

Another object of the present invention is the provision of a novel overhead tramrail system comprising a plurality of cars arranged in a continuous loop and moved around an endless rail or track by tractor or propelling means incorporated in certain of the cars, in which system the binding or snubbing action heretofore produced in similar systems by the cars traveling around the curved portions of the rail will be greatly reduced if not entirely eliminated.

Another object of the present invention is the provision of a novel overhead tramrail system comprising a plurality of tractors and carriers arranged in a continuous loop and moved around an endless rail or track by the tractors which are interposed between certain of the carriers and connected thereto by resilient means whereby the binding or snubbing action heretofore produced in similar systems by the carriers traveling about

the curved portions of the rail or track is greatly reduced if not entirely eliminated.

The present invention resides in certain novel details of construction and combinations and arrangements of parts, and further objects and advantages thereof will be apparent to those skilled in the art to which the invention relates from the following description of the preferred embodiment thereof described with reference to the accompanying drawing forming a part of this specification, in which similar reference characters designate corresponding parts and in which

Fig. 1 is a diagrammatic view in plan of an overhead tramrail system embodying the present invention;

Fig. 2 is an elevational view approximately on the line 2—2 of Fig. 1 showing a portion of the overhead tramrail system shown in Fig. 1;

Fig. 3 is an enlarged view of a part of Fig. 2 with portions in section;

Fig. 4 is a view similar to Fig. 3 but showing a modified form of connector;

Fig. 5 is a section on the line 5—5 of Fig. 4; and

Fig. 6 is a view similar to Figs. 3 and 4 but in plan showing a connector of further modified construction.

For the most part the tramrail system herein illustrated and described is commercially known in the art and only that part thereof necessary to a complete understanding of the present invention will be herein illustrated and described in detail.

Referring to the drawing Fig. 1 shows diagrammatically an electrified overhead tramrail system comprising a plurality of carriers A arranged in a continuous loop, supported on a continuous track comprising a rail 10, and adapted to be moved thereabout by a plurality of tractors B interposed between certain of the carriers. The rail 10, conductor bars 11 and 12, carriers A, and tractors B, per se, form no part of the present invention. While the particular rails, conductor bars, carriers, and tractors shown in the drawing and referred to herein are commercially known as "Cleveland Tramrail," they may be of any suitable construction depending upon the requirements of the particular installation under consideration. Each of the carriers shown comprises a pair of double wheeled trucks 13 and 14 connected by a load bar 15, and the tractors which are similar to the tractor shown in U. S. Patent No. 1,759,177 comprise a frame 16 suspended from the rail 10 by means of wheels 17

which in turn are adapted to be driven in a conventional manner by an electric motor 18 forming a part of the tractor B.

In the embodiment shown the carriers A are arranged in a continuous loop or train with two tractors B interposed between certain of the carriers and equally spaced from each other. The direction of travel is as indicated by the arrow d. Each of the carriers A is connected to the adjacent carrier, and the carriers directly behind the tractors are connected to the tractors, by rigid connector bars opposite ends of which are articulately connected to adjacent carriers or tractors, as the case may be, by means of universal knuckle joints having a small amount of lost motion therein. In the preferred embodiment the two carriers A' immediately in front of the tractors B are articulately connected to the tractors by resilient or expandible connectors designated generally by the reference character C, and comprising springs, preferably preloaded, which springs because of the presence of lost motion in the connections between the cars facilitate changes in the length of the train or a portion thereof under varying load conditions and a proportioning of the load among a plurality of the tractor units when more than one tractor is employed, which is the usual case in commercial installations.

The two connectors C shown in Fig. 1 are identical in construction and therefore only one will be described in detail. The connector C, see Fig. 3, comprises an elongated bolt 20 the shank of which projects through a suitable aperture in a collar 21 pivotally connected for movement about a vertical axis to a member 22 through the medium of bolts 23. The shank of the bolt 20 to the left of the collar 21, as viewed in Fig. 3, is surrounded by a compression spring 24, one end of which abuts against the collar 21 while the other end engages a washer 25 adapted to abut against an adjusting nut 26 threaded onto the bolt. The threaded end of the bolt 20 projects into a tapped aperture 27 in a member 28 and is non-rotatably retained therein by a jam nut 29. The member 22 previously referred to is connected to the load bar 15 of the carrier A' by a square shank pin 30, and the member 28 is pivotally connected for movement about a vertical axis to a member 31 by a pintle pin 32. The member 31 is in turn pivotally connected for movement about a horizontal axis to the frame 16 of the tractor B by a pintle pin 33.

As previously stated, the carriers A are connected together and to the tractors B by means of rigid or solid connectors with the exception of the connectors between the tractors and the carriers A' immediately in advance thereof. The spring 24 is so selected and preloaded by means of the adjusting nut 26 that under normal operating conditions certain of the carriers ahead of the tractors, preferably about half thereof, are pushed while the remainder of the carriers are pulled about the track. As load conditions vary due to the snubbing action referred to, etc., the springs because of the presence of lost motion in the connections between the cars facilitate changes in the length of the train or parts thereof and a proportioning of the load among the tractors where more than one tractor is employed. As will be readily apparent, this combined pushing and pulling of the carriers between the tractors relieves the binding or snubbing effect produced by the carriers going around the bends in the track, thus requiring fewer

tractors for a predetermined system than heretofore have been required.

Connectors of modified form are shown in Figs. 4, 5, and 6. The connector shown in Figs. 4 and 5 comprises a plurality of elongated bolts 35 projecting through aligned apertures in disk-like heads formed on end members 36 and 37. The threaded ends of the bolts 35 are fixed to the head of the member 36 by jam nuts 38 and the bolts are free to move relative to the member 37. Compression springs 40 surrounding the bolts 35 are positioned between the head of the member 37 and washer 41 abutting against adjusting nuts 42 threaded onto the bolts. Preloading the springs 40 causes the tractor to push a part of the load. The amount or proportion of the load pushed can be governed by adjusting the nuts 26 (Fig. 3) and 42 (Fig. 4) which also provide means for compensating for wear, etc.

The connector shown in Fig. 6 comprises two pairs of telescoped members 45 and 46 continuously urged in a manner to elongate the same by compression springs 47 enclosed within the same. One pair of said members is rigidly connected to the tractor B while the other pair thereof is connected to the load bar 15 of the carrier A' in advance of the tractor. Adjacent ends of said pairs of members are provided with convex contact shoes or members 48 adapted to abut each other at all times.

While the preferred connectors are herein shown and described in considerable detail the particular form of the connector is immaterial so long as resilient means is incorporated therein. It will also be apparent that tension springs may be used in place of compression springs, and that resilient or extendible connectors may be used to connect the tractors with the carriers immediately therebehind instead of with the carriers immediately in front thereof. In some instances it is preferable to have resilient connectors both ahead of and behind the tractor units. It is also to be understood that the tractor or propelling means may be incorporated in the carriers or carrier cars instead of constituting separate cars or units as is the case in the preferred embodiment of the invention shown. I do not wish to be limited to the particular constructions herein shown and described which constructions may be varied within the scope of the invention and it is the intention to cover hereby all adaptations, modifications and alternative constructions falling within the spirit and scope of the present invention as defined in the following claims.

I claim:

1. In an overhead carrier system of the character referred to, the combination of a continuous overhead track, a plurality of cars operatively connected together in an endless train and movable about said track, a plurality of said cars having lost motion therebetween and at least one of said cars including propelling means for moving the train about said track, and resilient means for operatively connecting a plurality of said cars whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

2. In an overhead carrier system of the character referred to, the combination of a continuous overhead track, a plurality of cars operatively connected in an endless train and movable about said track, a plurality of said cars having lost motion therebetween and at least one of said cars including propelling means for moving the

train about said track, and resilient means for operatively connecting a car including propelling means with a car immediately adjacent thereto whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

3. In an overhead carrier system of the character referred to, the combination of a continuous overhead track, a plurality of cars operatively connected in an endless train and movable about said track, a plurality of said cars having lost motion therebetween and at least one of said cars including propelling means for moving the train about said track, and resilient means for operatively connecting a car including propelling means with the car immediately in front thereof whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

4. In an overhead carrier system of the character referred to, the combination of a continuous overhead track, a plurality of cars operatively connected in an endless train and movable about said track, a plurality of said cars having lost motion therebetween, a plurality of said cars including propelling means for moving the train about said track, said cars including propelling means being spaced in said train, and resilient means for operatively connecting a plurality of said cars together whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

5. In an overhead carrier system of the character referred to, the combination of a continuous overhead track, a plurality of cars operatively connected in an endless train and movable about said track, a plurality of said cars having lost motion therebetween, a plurality of said cars including propelling means for moving the train about said track, said cars including propelling means being spaced in said train, and resilient means for operatively connecting said cars including propelling means with cars adjacent thereto whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

6. In an overhead carrier system of the character referred to, the combination of a continuous overhead track, a plurality of cars operatively connected in an endless train and movable about said track, a plurality of said cars having

lost motion therebetween, a plurality of said cars including propelling means being spaced in said train, and resilient means for operatively connecting said cars including propelling means with the cars immediately in front thereof whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

7. In an overhead carrier system of the character referred to, the combination of a continuous overhead track, an endless series of tractor units and carrier units connected in a continuous train and movable about said track, a plurality of said units having lost motion therebetween, said tractor units being interposed between said carrier units at spaced points and adapted to move said train about said track, and resilient means for operatively connecting a plurality of said units together whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

8. In an overhead carrier system of the character referred to, the combination of a continuous overhead track, an endless series of tractor units and carrier units connected in a continuous train and movable about said track, a plurality of said units having lost motion therebetween, said tractor units being interposed between said carrier units at spaced points and adapted to move said train about said track, and resilient means for operatively connecting a plurality of said tractor units with carrier units adjacent thereto whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

9. In an overhead carrier system of the character referred to, the combination of a continuous track, an endless series of tractor units and carrier units connected in a continuous train and movable about said track, a plurality of said units having lost motion therebetween, said tractor units being interposed between said carrier units at spaced points and adapted to move said train about said track, and resilient means for operatively connecting said tractor units with the carrier units immediately in advance thereof whereby changes in the length of the train or a portion thereof under varying load conditions are facilitated.

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