Feb. 4, 1964 J. H. HAHN 3,120,080

RESILIENTLY DEFORMABLE MODEL RAILWAY TRUCK ASSEMBLY

Filed Oct. 9, 1961

FIG. 1

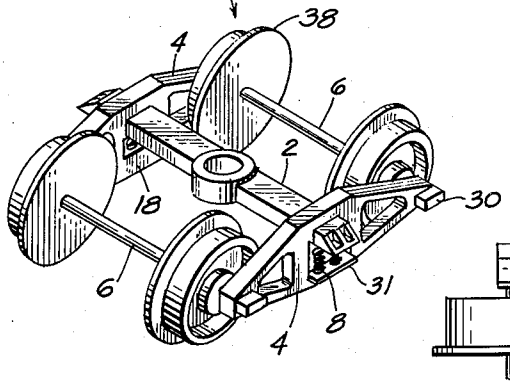


FIG. 4

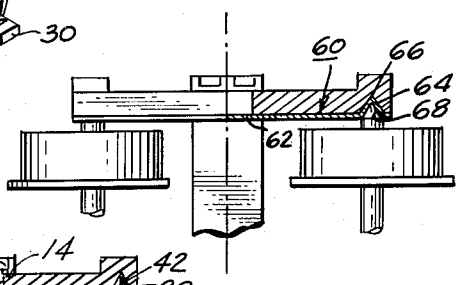


FIG. 2

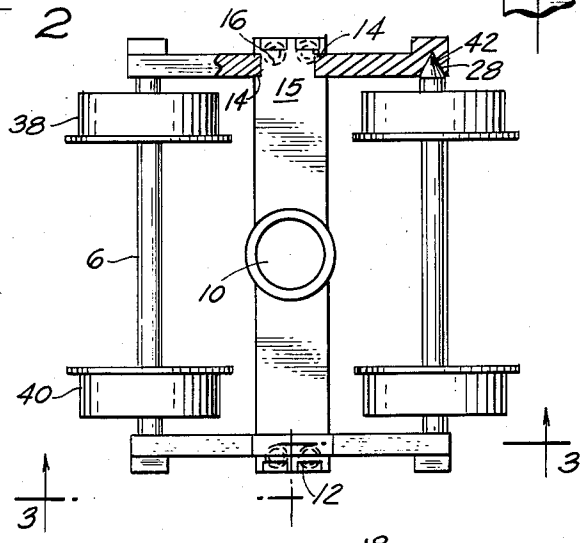
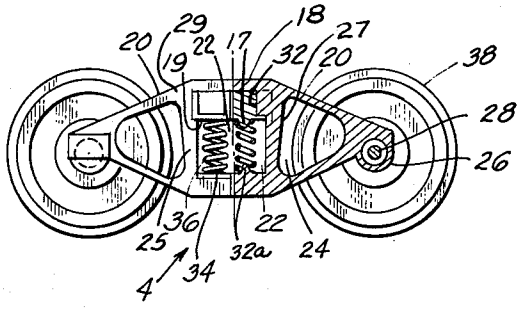


FIG. 3



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RESILIENTLY DEFORMABLE MODEL RAILWAY TRUCK ASSEMBLY

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4 Claims. (Cl. 46—221)

This invention relates to a construction of a truck assembly for scale model railway equipment.

The novel truck assembly for a scale model railway car produced in accordance with this invention is characterized by a universal type multi-directional resiliency which is provided by an H-shaped bolster-end plate configuration with spring means resiliently interconnecting the bolster to the end plates such that the bolster is resiliently deformable in a horizontal direction relative to an assembled truck positioned on its guiding rails. Additionally, the end plates are formed of a resilient material in a leaf spring design such that, while the central portion of the end plates are resiliently interconnected to the bolster, the end portions of the leaf spring end plates, which support the wheeled axles of the truck therebetween, are resilient deformable in a vertical direction relative to the aforementioned assembled truck. It has been found that such a structure can be efficiently manufactured from molded plastic parts for various of the described elements and especially that such a manufacture of the end plates from a resilient plastic material such as a polyformaldehyde synthetic polymer yields unexpectedly unique operating characteristics in the scale model railway system.

Heretofore, model railway trucks have been generally constructed as one-piece die-molded metal members comprising integral bolsters and end plates with separate axle and wheel assemblies for rotatable mounting within the bolster-end plate unitary structures. Efforts to form the one-piece trucks of the prior art from plastic have been generally unsuccessful since the molding costs for intricately shaped plastic members become prohibitive and furthermore since such a one-piece plastic member is not strong enough to absorb the shocks of use, the juncture of the bolster and the end plates being a generally frangible stress point. Moreover, the rigid and nonresilient nature of the generally H-shaped wheel housings of the prior art have been incapable of delivering a performance in model railway use which simulates the actual operating characteristics of a full-scale railway truck.

However, the present invention obviates the deficiencies of the prior art and produces an improved truck construction which may be readily formed from plastic and which is characterized by operating characteristics and responses such as start and stop, horizontal bounce, and vertical roll closely simulating those in actual railroad use. The invention provides a key-lock of the ends of the bolster in the respective central portions of the two end plates with spring means urging the bolster plates into the respective receiving slots in the end plates and also provides leaf spring end plates to rotatably mount the wheeled axles therebetween. The bolster is thus horizontally deflectable at either or at both of its ends and the end plates are likewise vertically deflectable at either or at both of their respective ends such that a railway car carried on the truck will bounce and roll and respond to track curvatures and irregularities and graded inclines in a fashion quite similar to that of a real railway car in actual use.

In addition to the simulation of actual railroad operation, the multi-directional resiliency of the subject truck assembly assures a more positive operation and more realistic acceleration characteristics for the model railroad equipment as well as a diminution in annoying and often destructive track derailments. Furthermore, the subject

truck assembly is characterized by a unique and simplified assembly and disassembly such that a hobbyist may readily assemble the finished structure from knocked-down kit form and may readily disassemble the structure to replace individual parts.

Accordingly, it is an object of this invention to provide a multi-directional resiliency for the wheel supporting frame of a model railway truck assembly in order to improve the operating characteristics thereof.

It is another object of this invention to provide a model railroad truck assembly which may be assembled or disassembled in a simple and expeditious fashion in order to provide an economically practical and realistically appearing piece of scale model equipment, for sale in a component knocked-down kit form or as an assembled unit.

It is a related object of this invention to provide a model railroad truck assembly which may be constructed by molding certain of the component parts thereof from plastic.

These and other objects and advantages of this invention will hereinafter appear, and for purposes of illustration, but not of limitation, an embodiment of the invention is shown in the accompanying drawing, in which:

FIG. 1 is a perspective view of an assembled resilient model railway truck embodying the concepts of this invention;

FIG. 2 is a top plan view of the structure of FIG. 1, partially broken away to show details of construction;

FIG. 3 is a front elevational view, partially in section along the line 3—3 of FIG. 2; and

FIG. 4 is a fragmentary view similar to FIG. 2, showing a modified truck assembly incorporating a metallic leaf spring as a current pick-up.

In the drawing, the novel resilient model railway truck assembly 1 is seen to comprise a cross-bolster 2, end plates 4, spring means 8 resiliently interconnecting the bolster 2 and the end plates 4, and axles 6 journaled for rotation between the end plates 4.

The bolster 2 is generally rectangular in form and is provided with a bearing housing 10 at the midportion thereof for connection with a suitable lug of the model railway car (not shown) which is to be supported by the novel truck assembly. Adjacent the respective ends of the bolster 2, generally I-shaped grooves 15 are provided by the recessed channel slots 14 oppositely disposed across the stem 16 of the I-shaped grooves 15. The bolster 2 may be tapered and recessed as shown at 12 in order to simulate actual railroad truck structure.

The end plates 4 each comprise a generally rectangular middle portion 18 and two oppositely disposed triangular portions 20 contiguous with the said middle portion 18. The middle portion 18 is provided with a T-shaped slot 22 as indicated by the stem 32 and the head 32*a* thereof. The triangular end portions 20 are provided with triangular openings 24 extending through the end plate 4 so that the cross braces 25, 27 are defined separating the middle portion 18 and the end portions 20 and bracing the peripheral portion 29 of the end plate 4.

Adjacent the respective outer ends of the end portions 20 and integrally formed therewith are the wheel bearing flanges 26, which comprise conical recesses 28 each adapted to support an end portion of the axles 6 in a manner to be subsequently described. The end plates 4 may be provided with decorative attachments, such as the lugs 30, in order to more adequately simulate real railroad truck assemblies.

The end plates 4 art each provided with protruding shelves 31 which extend from the bottom of the head 32*a* of the T-shaped slot 22. Two nodules 34 are positioned on the shelf 31, and two correspondingly aligned nodules 17 are provided on the underside 19 of the cross-bolster 2.

The spring means 8 comprise helical coil springs 36 which resiliently interconnect the cross bolster 2 and the end plates 4 by suitable positioning of the coil springs 36 between the nodules 17 and 34. Instead of the nodules 17 and 34, recesses could be formed on the shelf 31 add on the underside 19 of the cross-bolster 2 for positioning of the coil springs 36.

The axles 6 are provided with conically tapered end portions 42 which are suitable for positioning in the conical recesses 28 of the end plates 4 so that the axle 6 may be rotatably journaled between the parallelly aligned end plates 4. The axles 6 are provided with wheels 38 rigidly secured thereto for rotation therewith, and the wheels 38 are provided with flanges 40 in a well-known manner such that the wheels 38 can ride upon and be guided by suitably positioned tracks (not shown).

To assemble the novel truck assembly 1, the end portions of the cross-bolster 2 are respectively guided through the head portions 32*a* of the T-shaped slots of the end plates 4 until the stem 16 of the I-shaped groove 15 of the bolster 2 is aligned beneath the stem 32 of the T-shaped slot 22 of the end plates 4. The cross-bolster 2 is then raised to intermesh with the respective stems 16 and 32 and thus to form a key-lock. The helical coil springs 36 are positioned about the respective nodules 17, 34 to maintain the described key-lock with the I-shaped slot 15 of the bolster 2 positioned within the T-shaped groove 22 of the end plates 4.

The axles 6 with the wheels 38 attached thereto are then positioned between the end plates 4 by inserting the conically tapered points 42 of the axle 6 in the conical recess 28. FIG. 4 shows a modification of the axle housings in that a metallic leaf spring 60 is provided for insertion in a slot 62 of the cross-bolster 2. The spring 60 is provided with conical recesses 64, the exterior surfaces 66 of whch are received in the conical recesses 28 of the end plates 4 and the interior surface 68 of which receive the tapered points 42 of the axles 6. Suitable wire leads (not shown) are attached to the spring 60 such that current in the tracks over which the truck assembly rides is conducted through the wheels 38 and through the spring 60 for energization of the supported scale model railway car in a conventional manner. Springs 60 may be positioned adjacent each end plate 4 as desired.

The disassembly of the composite structure is of course effected by the reversal of the previously described steps, that is, by removing the axles 6, the coil springs 36, and by removing the I-shaped grooves 15 of the cross-bolster 2 from the T-shaped slots 22 of the end plates 4.

The described simple and expeditiously formed interconnection of the various components affords a rigid and sturdy truck assembly which is resiliently deformable in various directions to absorb the stresses to which the truck assembly is subject under operation. For example, the bolster 2 may be depressed and elevated relative to the end plates 4 by compression and expansion of the springs 36. Likewise, the end plates 4 may be skewed relative to each other in which case the axles 6 therebetween would be correspondingly skewed relative to each other. Also, either axle 6 may be rotated relative to the other by retaining one of the axles 6 in position, applying a force to the cross-bolster 2 (such as the weight of the supported railway car), and rotating the other axle 6 and the end plates 4 upwardly towards the cross-bolster 2, thereby compressing the springs 36.

Another unique feature of the composite inter-assembly resides in the leaf spring conifiguration of the end plates 4. When the end plates 4 are formed of a suitable resilient material, such as a resilient synthetic plastic, axial forces along the axles 6 will result in deflection of the triangular end portions 20 of the end plates 4 relative to the key-locked middle portion 18 thereof. The described deflection of the triangular end portion 20 may occur at any one of the end portions 20 or at two

of the end portions 20 of the same end plate 4 at the same time or at all four of the triangular end portions 20 of two aligned end plates 4 at the same time. Moreover, the leaf spring deflection of the end plates 4 may occur either alone as described or in combination with any of the other resilient deformations of the composite assembly.

It has been found that formation of the leaf spring end plates 4 and preferably also of the bolster 2 from a polyformaldehyde synthetic plastic (such as the type commercially available from E. I. du Pont de Nemours & Co., Inc., under the trade name Delrin) gives especially advantageous results in that the strength, weight, and resiliency of the composite truck combine to support and carry a scale model railway car (which is usually constructed of molded plastic) in a manner characterized by unexpected realism in operation. Moreover, since the bolster and the end plates are individual component parts, the molding thereof is rendered feasible under present day commercial techniques.

It should be apparent that the composite model railway truck assembly comprising the subject invention provides a construction which may be readily assembled and disassembled with a minimum of effort to form a sturdy model railway truck which may be resiliently deformed in various directions in order to more realistically simulate the movements and responses of actual railroad operation, to assure a more positive operation of the model railway equipment by virtue of its ability to absorb irregularities in its guiding track structure, and to diminish derailments of the truck from its guiding track structure by virtue of the extreme latitudes of resiliency exhibited by the assembled truck.

It should also be apparent that the truck assembly as described may be sold to the ultimate consumer in an assembled form as a building unit for model railway equipment, in an attached form to a model railway car, or in a knocked-down kit form for subsequent assembly by the individual hobbyist.

It should be understood that various changes and modifications may be made in the details of construction, arrangements, operations, and materials for the various elements without departing from the spirit and the scope of the invention, as defined in the appended claims.

What is claimed is:

1. A model railway truck consisting of

a bolster having I-grooves in the respective ends thereof;

two resilient plastic end plates of leaf spring configuration each located near a respective end of said bolster and each comprising a generally rectangular middle portion and two oppositely disposed triangular portions contiguous with the said middle portion, the respective middle portions of the said end plates having T-shaped slots therein;

spring means interconnecting said plates to said bolster comprising coil springs located within said T-shaped slots of the end plates and parallel to the said I-grooves of the bolster, and means provided on said bolster and on said end plates to maintain said coil springs in position between said bolster and said end plates;

and wheel means each comprising an axle with wheels mounted thereupon, each said axle being parallel to said bolster and positioned between said end plates,

the stems of the said I-grooves of the said bolster being keyed in position within the stems of the said T-shaped slots of the said end plates, so as to allow relative resilient movement of any one of the bolster, end plates, or axles relative to any or all of the others.

2. The truck of claim 1 wherein each said end plate is provided with conically recessed axle bearings and each said axle is provided with conically tapered end portions adapted for rotatable mounting within said recessed bearings.

3. A knocked-down kit adapted for assembly into a model railway truck comprising:

axles and wheels mounted thereon;

end plates for rotatably housing said axles, the said end plates being resilient plastic members each having a leaf spring configuration;

a cross-bolster for supporting said end plates;

and spring means for resiliently interconnecting the bolster and the end plates.

4. In a model railway truck, an H-shaped wheel-supported frame comprising a bolster; two plastic end plates, said end plates comprising means resiliently deformable in a vertical direction relative to said truck; and spring means resiliently interconnecting the said end plates to the said bolster.

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