Dec. 1, 1964 H. G. SCHULTZ 3,159,113

TRANSPORT STRUCTURE

Filed Sept. 16, 1960 3 Sheets-Sheet 1

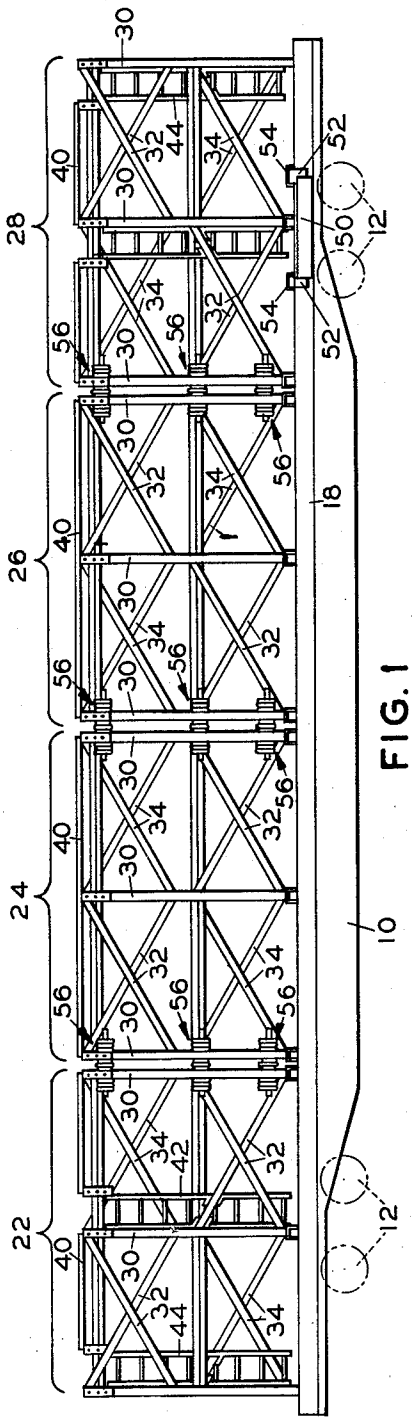


FIG. 1

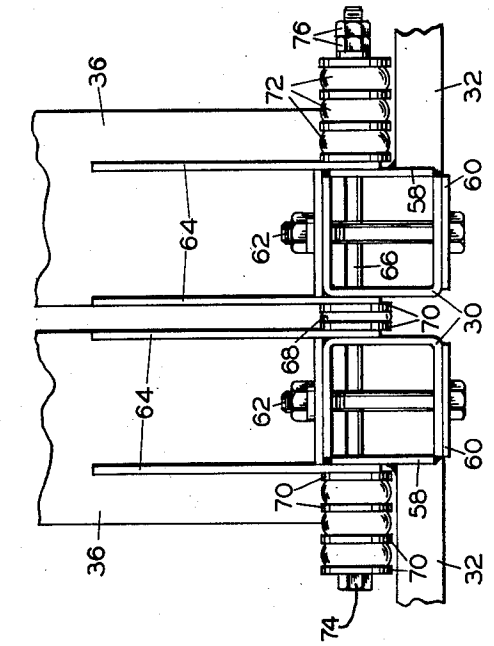


FIG. 4

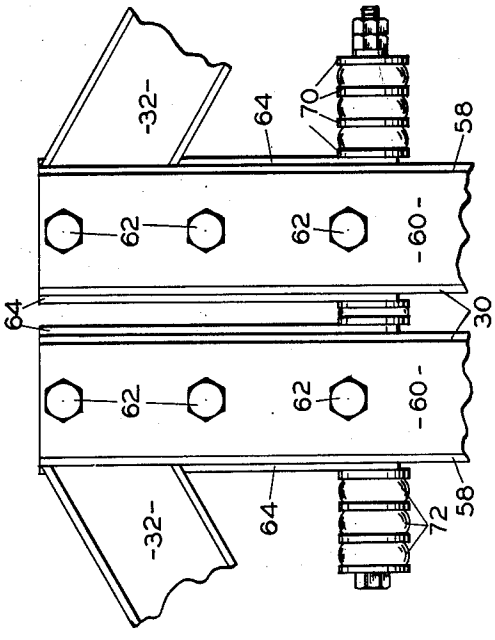


FIG. 3

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TRANSPORT STRUCTURE

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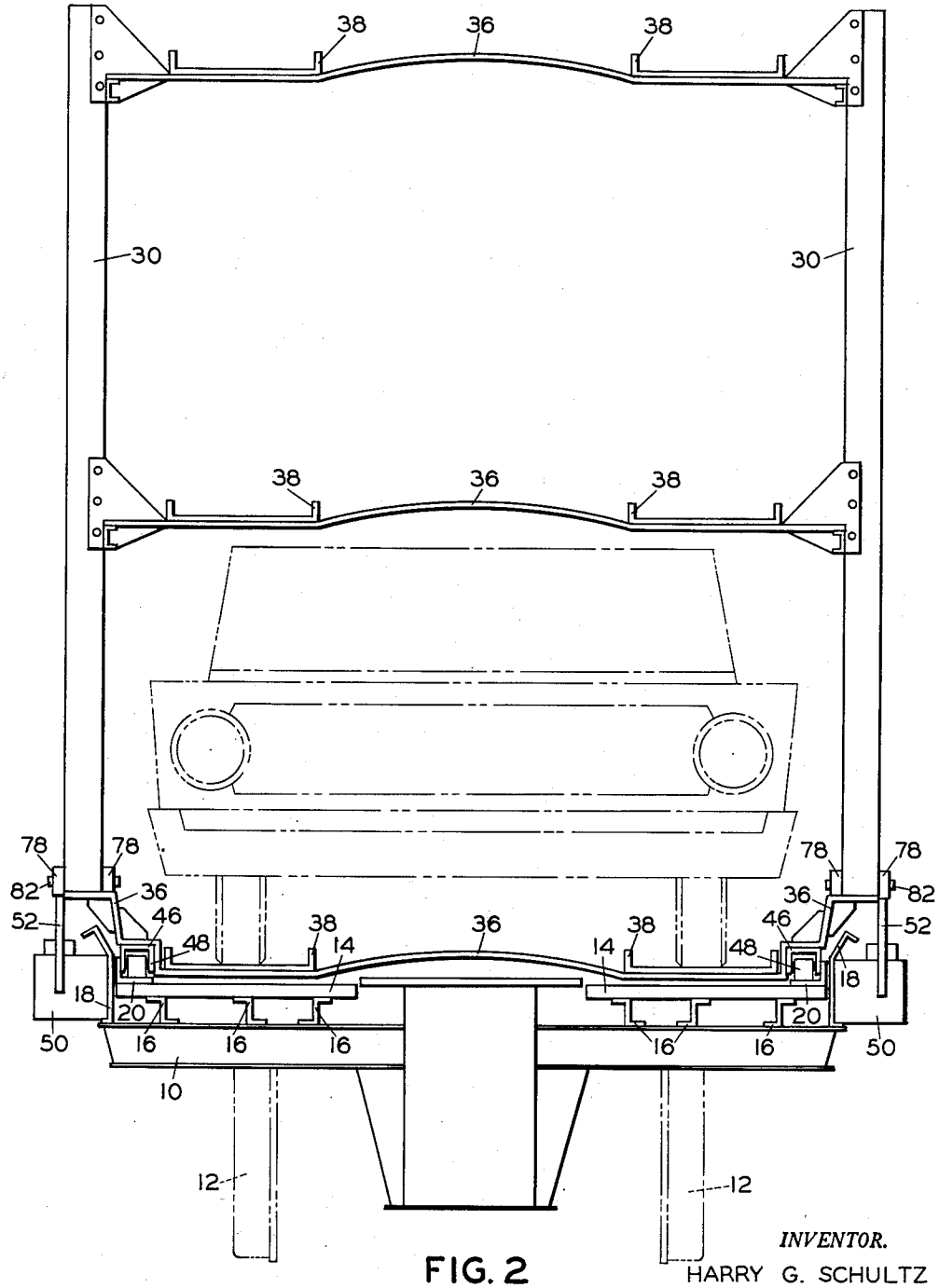


FIG. 2

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TRANSPORT STRUCTURE

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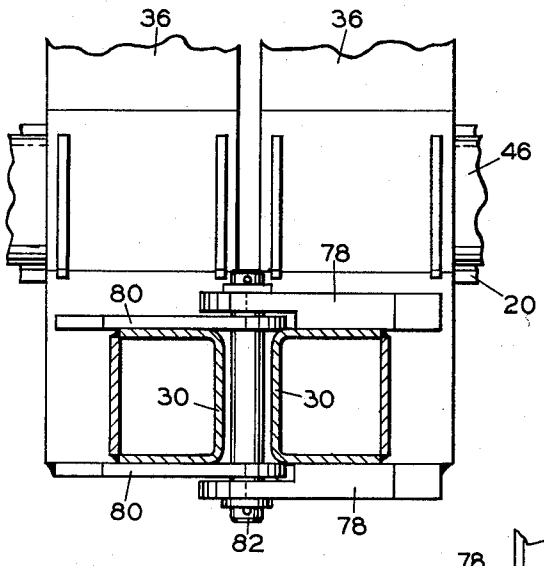


FIG. 6

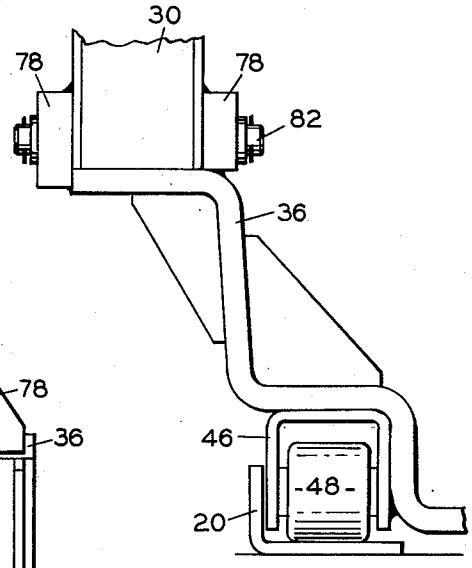


FIG. 7

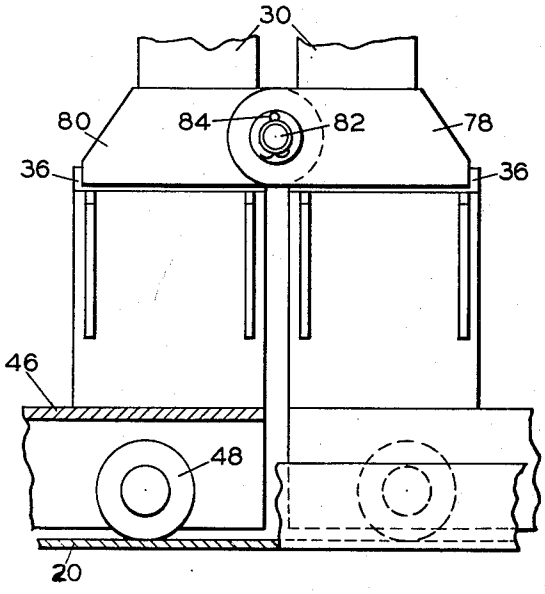


FIG. 5

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3,159,113

TRANSPORT STRUCTURE

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Filed Sept. 16, 1960, Ser. No. 56,417
6 Claims. (Cl. 105—368)

This invention relates to movable connections for structural members and more particularly to a transporting structure having resilient or hinged connections between structural sections thereof.

In the transportation of merchandise by railroad or truck considerable damage is done to the goods or to the transporting structure itself as a result of impact shocks. To reduce these impact shocks, railway car superstructures have been rollingly mounted on the flat car and buffer springs have been provided to resiliently oppose or cushion movement of the superstructure relative thereto. This has reduced impact shocks to some extent but has not completely solved the problem. Furthermore, since flat cars are normally crowned or provided with a camber to compensate for load deflection, an initial load is imposed on the railway car superstructure when it is positioned on the flat car. The superstructure is further stressed upon twisting of the superstructure as the transporting device negotiates a curve.

Recent concepts in the transportation industry also dictate the use of a superstructure composed of shorter, lighter sections so that the superstructure may be easily constructed on a railway car or truck or removed to meet various shipping requirements.

It is an object of this invention to reduce twisting stresses on a railway car superstructure by constructing the superstructure of a plurality of separate movably connected sections.

It is another object of this invention to further reduce impact shocks by the use of resilient connections between the superstructure sections in addition to the commonly employed superstructure buffer spring.

In one preferred embodiment of this invention a transporting structure is provided with a bed and shock absorbing means adapted to be suitably connected to the transporting structure. A superstructure is positioned on the bed and is adapted to be movable relative thereto by a plurality of rollers mounted on the bottom of the superstructure. The superstructure is connected to the shock absorbing means so that movement of the superstructure is resisted by the shock absorbing means. The superstructure is composed of a plurality of sections connected to each other for limited relative movement to provide a snake-like action between the sections to reduce stresses on the same.

These and other objects and advantages of this invention will become apparent from the following detailed description when taken in connection with the accompanying drawings wherein:

FIG. 1 is a side elevation view of a railway car embodying this invention;

FIG. 2 is an enlarged end elevation view of the railway car of FIG. 1;

FIG. 3 is an enlarged elevation view of a detail of this invention;

FIG. 4 is an enlarged plan view of the detail shown in FIG. 3;

FIG. 5 is an enlarged elevation view of a modification of this invention;

FIG. 6 is an enlarged plan view of the modification shown in FIG. 5; and

FIG. 7 is an enlarged end elevation view of the modification shown in FIG. 5.

Referring to the drawings and more particularly to FIGS. 1–4, the transporting structure is shown as comprising a main frame 10 suitably supported by railway wheels 12. A bed is carried by the main frame 10 and includes longitudinally extending floor members 14 each supported by three Z-section members 16 extending longitudinally with the main frame 10. A pair of bent-over channel members 18 are suitably attached to the sides of the main frame 10 and extend longitudinally with the floor members 14 and the Z-section members 16. A pair of roller tracks are provided in the form of angular members 20 having one leg resting on the floor members 14 and the other leg bearing against the bent-over channel members 18.

A superstructure is adapted to be positioned on the railway car bed. The superstructure is composed of a plurality of subassemblies 22, 24, 26 and 28. Each subassembly 22, 24, 26 and 28 is substantially similar in construction and the details of only one need be described. The subassemblies comprise six (three on each side of the railway car) vertically extending side posts 30 of channel-shaped cross section. The three side posts on each side are interconnected by crossed brace members 32 or 34 to form side sections. The crossed brace members 32 and 34 are arranged in staggered relationship with a crossed set of members positioned on a lower and upper level on both side sections of the railway car subassemblies. The open spaces left by the staggered crossbraces 32 and 34 permit opening of the doors of a transported automobile. The crossed members 32 as viewed in FIG. 1 are on the near side of the railway car whereas crossed brace members 34 connect the side post 30 on the far side of the railway car. Three vertically spaced transversely extending members 36 are adapted to suitably connect the oppositely positioned side posts 30 of each side section as clearly shown in FIG. 2. Resting on the transversely extending members 36 are a pair of transversely spaced longitudinally extending wheel track members 38. The wheel track members 38 extend longitudinally for the full length of one subassembly. Each subassembly 22, 24, 26 and 28 is provided with a safety rail 40 on each side of the railway car and the end subassemblies 22 and 28 are provided with ladders 42 and 44 on the near and far side respectively so that access may be gained to the upper levels of the railway car.

Means is provided to movingly mount the superstructure on the railway car bed. More particularly, a channel-shaped member 46 is welded to the under surface of each end of the lowermost transversely extending members 36. Each channel-shaped member 46 is provided with a series of rollers 48 mounted on pins extending between the legs of the channel. The rollers 48 are positioned adjacent the side posts 30 and rest on the roller tracks 20 to permit longitudinal movement of the superstructure relative to the railway car bed.

Means is provided ti limit longitudinal movement of the superstructure. To this end, an eloganted box structure 50 is secured to each bent-over channel member 18 adjacent an end thereof. The box structure 50 houses a conventional shock absorbing means, such as a hydraulic shock absorber. The box structure 50 is provided with elongated slots (not shown which are adapted to receive a pair of lugs 52. The lugs 52 are secured to a pair of auxiliary transverse members 54 which are provided on the subassembly 28. The auxiliary transverse members 54 are similar to transverse members 36 and the ends thereof rest on and are supported by the channel-shaped members 46. It is now apparent that upon longitudinal movement of the superstructure, one of the lugs 52 (depending on the direction of movement) will operate the shock absorbing means within the box structure 50 to cushion movement of the superstructure.

The subassemblies 22, 24, 26 and 28 are connected by resilient means for longitudinal movement as a unit while

still permitting relative or snake-like movement of the subassemblies. More particularly, three vertically spaced resilient connecting means, indicated generally at 56, are provided between adjacent posts 30 of the side sections of the respective subassemblies 22, 24, 26 and 28.

As shown in FIGS. 3 and 4, the channel-section side posts 30 are closed by a plate 58 welded to the legs thereof to form box sections. The legs of the channel-section side posts 30 are strengthened by reinforcing plates 60 held in place by vertically spaced bolts 62. A pair of parallel connecting plates 64 are welded to each of the transverse members 36 and to opposite sides of the box section formed by the channel-section side posts 30 and the plate 58. A bolt or pin 66 extends through aligned apertures provided in the box sections of adjacent side posts 30 and in each pair of connecting plates 64. A rubber annulus or biscuit 68 is positioned between the side posts 30 and has a centrally disposed opening which accommodates pin 66. A pair of washers 70 are provided on either side of the rubber biscuit 68 and bear against connecting plates 64 of the subassembly sections to provide equal loading on the rubber biscuit. Three slightly thicker biscuits 72 are provided on each end of the pin 66 and are suitably separated by washers 70. Fastening means is provided to hold the side posts 30 and the rubber biscuits 68 and 72 together as a unit so that the only relative movement between the side posts 30 is that permitted by compression of the rubber biscuits. This fastening means takes the form of a head 74 provided on one end of the pin 66 and a pair of nuts 76 threaded on the other end of pin 66 to lock the members in place. It is apparent from the foregoing that the subassemblies 22, 24, 26 and 28 or side sections thereof may have limited movement relative to its adjacent subassembly or section against the bias of the rubber biscuits 68 and 72.

Referring now to the modification of this invention shown in FIGS. 5–7, the plurality of resilient connecting means 56 between side posts of adjacent subassemblies have been replaced by a hinge-type connection. More specifically, a pair of spaced parallel ear members 78 are welded to one of the side posts 30 and the lowest transverse member 36 of the subassembly. Another pair of spaced parallel ear members 80 are welded to the lowest transverse member 36 and the side posts 30 of the adjacent section of a separate subassembly. The ends of the ear members 78 and 80 extend in an inter-related position and a pin 82 extends through suitable apertures provided in the ear members. Cotter pins 84 are provided on the ends of the pin 82 to hold the same in place.

A hing-type connection similar to that just described is provided for each side section of subassemblies 22, 24, 26 and 28 and serves to connect the subassemblies together for movement as a unit. It is also apparent that relative or snake-like movement may occur between the subassemblies merely by the pivoting of the subassemblies relative to each other on pivot pins 82.

It is evident that by utilization of a plurality of subassemblies movably connected together by the resilient connecting means or the hinge-type connecting means, stresses on the superstructure as a whole are reduced. Furthermore, the resilient connecting means between the subassemblies dampens impact shocks on the superstructure.

While only one preferred embodiment and a single modification thereof have been shown and described, it is apparent that there may be many changes in structure as well as operation without departing from the scope of this invention as defined by the appended claims.

I claim:

1. The combination with a railway car having a longitudinally elongated and laterally extending horizontal bed portion of

(*a*) a superstructure portion disposed vertically above said bed portion and supported thereby,

(*b*) said superstructure portion comprising a plurality of longitudinally aligned sections each of which include

(1) a first and second pair of longitudinally spaced vertically extending side posts with said first pair of side posts being laterally spaced from said second pair of side posts, and

(2) a plurality of longitudinally and laterally extending brace means rigidily interconnecting said side posts and maintaining the same in a vertical position with at least some of said brace means including load supporting horizontally disposed deck means,

(*c*) means carried by one of said portions and engaging the other of said portions and mounting said superstructure portion on said bed portion for relative longitudinal movement,

(*d*) shock absorbing means carried by said deck portion and connected to said superstructure portion and being operative to resist relative longitudinal movement between said portions, and

(*e*) resilient means resiliently connecting adjacent ends of said aligned section for relative movement in all directions whereby said sections are adapted for limited resilient relative movement while longitudinal movement of the superstructure portion relative to said bed portion is resisted by said shock absorbing means.

2. The combination with a railway car having a longitudinally elongated and laterally extending horizontal bed portion of

(*a*) a superstructure portion disposed vertically above said bed portion and supported thereby,

(*b*) said superstructure portion comprising a plurality of longitudinally aligned sections each of which include

(1) a first and a second pair of longitudinally spaced vertically extending side posts forming the longitudinal ends of said sections with said first pair of side posts being laterally spaced from said second pair of side posts, and

(2) a plurality of longitudinally and laterally extending brace means rigidly interconnecting said side posts and maintaining the same in a vertical position with at least some of said brace means including load supporting horizontally disposed deck means,

(*c*) means carried by one of said portions and engaging the other of said portions and mounting said superstructure portion on said bed portion for relative longitudinal movement,

(*d*) shock absorbing means carried by said deck portion and connected to said superstructure portion and being operative to resist relative longitudinal movement between said portions, and

(*e*) resilient means disposed between the adjacent side posts of said aligned sections and connected thereto and permitting limited resilient relative movement of the sections in all directions.

3. The combination with a railway car having a longitudinally elongated and laterally extending horizontal bed portion of

(*a*) a superstructure portion disposed vertically above said bed portion and supported thereby,

(*b*) said superstructure portion comprising a plurality of longitudinally aligned sections each of which include

(1) a first and a second pair of longitudinally spaced vertically extending side posts forming the longitudinal ends of said sections with said first pair of side posts being laterally spaced from said second pair of side posts, and

(2) a plurality of longitudinally and laterally extending brace means rigidly interconnecting said side posts and maintaining the same in a vertical position with at least some of said brace

means including load supporting horizontally disposed deck means,

(c) means carried by one of said portions and engaging the other of said portions and mounting said superstructure portion on said bed portion for relative longitudinal movement,

(d) shock absorbing means carried by said deck portion and connected to said superstructure portion and being operative to resist relative longitudinal movement between said portions, and

(e) means resiliently connecting adjacent side posts of said aligned sections while permitting relative movement of the sections in all directions,

(f) said resilient means comprising

(1) a pin extending through said adjacent side posts,

(2) resilient means mounted on said pin between said side posts,

(3) resilient means disposed adjacent the ends of said pin, and

(4) fastening means on said pin for holding the resilient means against said side posts,

(g) whereby said sections are adapted for limited resilient relative movement while longitudinal movement of the superstructure relative to said bed portion is resisted by said shock absorbing means.

4. The combination with a railway car having a longitudinally elongated and laterally extending horizontal bed portion of

(a) a superstructure portion disposed vertically above said bed portion and supported thereby,

(b) said superstructure portion comprising a plurality of longitudinally aligned adjacent sections each of which include

(1) a first and a second pair of longitudinally spaced vertically extending side posts forming the longitudinal ends of said sections with said first pair of side posts being laterally spaced from said second pair of side posts, and

(2) a plurality of longitudinally and laterally extending brace means rigidly interconnecting said side posts and maintaining the same in a vertical position with at least some of said brace means including load supporting horizontally disposed deck means,

(c) means carried by one of said portions and engaging the other of said portions and mounting said superstructure portion on said bed portion for relative longitudinal movement,

(d) shock absorbing means carried by said deck portion and connected to said superstructure portion and being operative to resist relative longitudinal movement between said portions, and

(e) a plurality of vertically spaced resilient means disposed between the adjacent side posts of said aligned sections and connected thereto for permitting limited resilient relative movement of said sections in all directions,

(f) whereby said sections are adapted for resilient relative movement while longtiudinal movement of said superstructure portion relative to said bed portion is resisted by said shock absorbing means.

5. The combination with a railway car having a longitudinally elongated and laterally extending horizontal bed portion of

(a) a superstructure portion disposed vertically above said bed portion and supported thereby,

(b) said superstructure portion comprising a plurality of longitudinally aligned sections each of which include

(1) a first and a second pair of longitudinally spaced vertically extending side posts forming the longitudinal ends of said sections with said

first pair of side posts being laterally spaced from said second pair of side posts, and

(2) a plurality of longitudinally and laterally extending brace means rigidly interconnecting said side posts and maintaining the same in a vertical position with at least some of said brace means including load supporting horizontally disposed deck means,

(c) means carried by one of said portions and engaging the other of said portions and mounting said superstructure portion on said bed portion for relative longitudinal movement,

(d) shock absorbing means carried by said deck portion and connected to said superstructure portion and being operative to resist relative longitudinal movement between said portions, and

(e) a plurality of vertically spaced resilient means disposed between the adjacent side posts of said sections on both lateral sides of said sections for permitting limited relative movement of said sections in all directions,

(f) each of said resilient means comprising,

(1) a pin extending through said adjacent side posts,

(2) a rubber biscuit positioned between said side posts and having an opening therein for receiving said pin,

(3) at least one rubber biscuit disposed adjacent each end of said pin and having an opening therein for receiving said pin, and

(4) fastening means on said pin for holding said rubber biscuits against said side posts.

6. In a railway car having a longitudinally elongated and laterally extending horizontal bed portion, the combination comprising,

(a) a superstructure portion carried by said bed portion and composed of a plurality of longitudinally aligned subassemblies,

(b) each subassembly including a pair of laterally spaced side sections each composed of a plurality of longitudinally spaced vertically extending side posts,

(c) a plurality of vertically spaced longitudinally and laterally extending horizontal deck members connecting said side sections and defining a plurality of horizontally disposed merchandise supporting levels,

(d) means carried by one of said portions and rollingly engaging the other of said portions and rollingly mounting said superstructure portion of said bed portion for relative longitudinal movement,

(e) shock absorbing means carried by one of said portions and being operative to resist relative longitudinal movement between said portions,

(f) means carried by the other of said portions and operatively connected to said shock absorbing means whereby longitudinal movement of said superstructure portion relative to said bed portion is resisted by said shock absorbing means, and

(g) a plurality of vertically spaced resilient means disposed between and connected to the adjacent side sections of the aligned subassemblies for permitting limited relative movement of said subassemblies in all directions.

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