

May 14, 1968

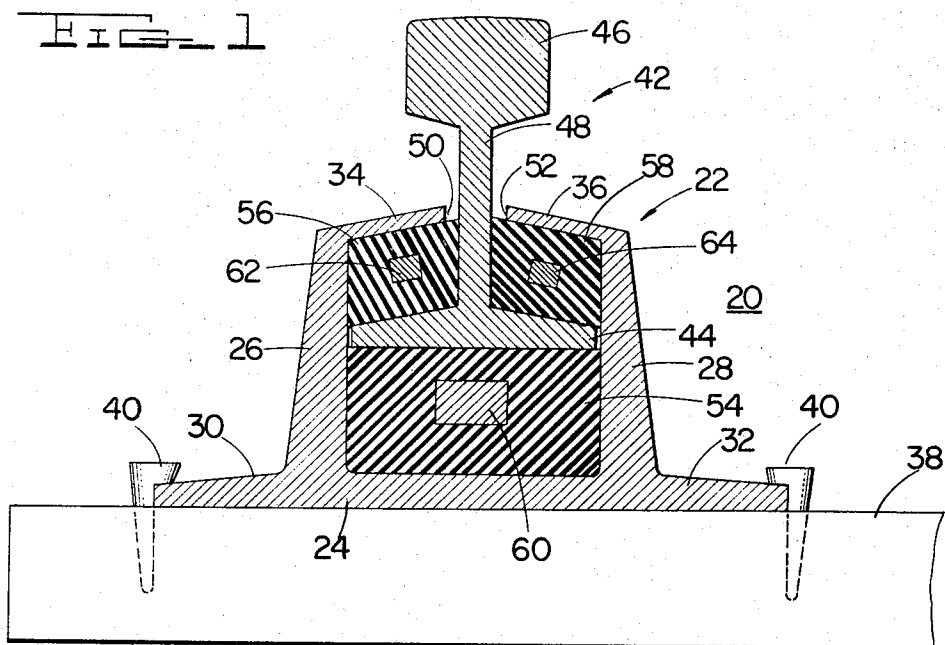
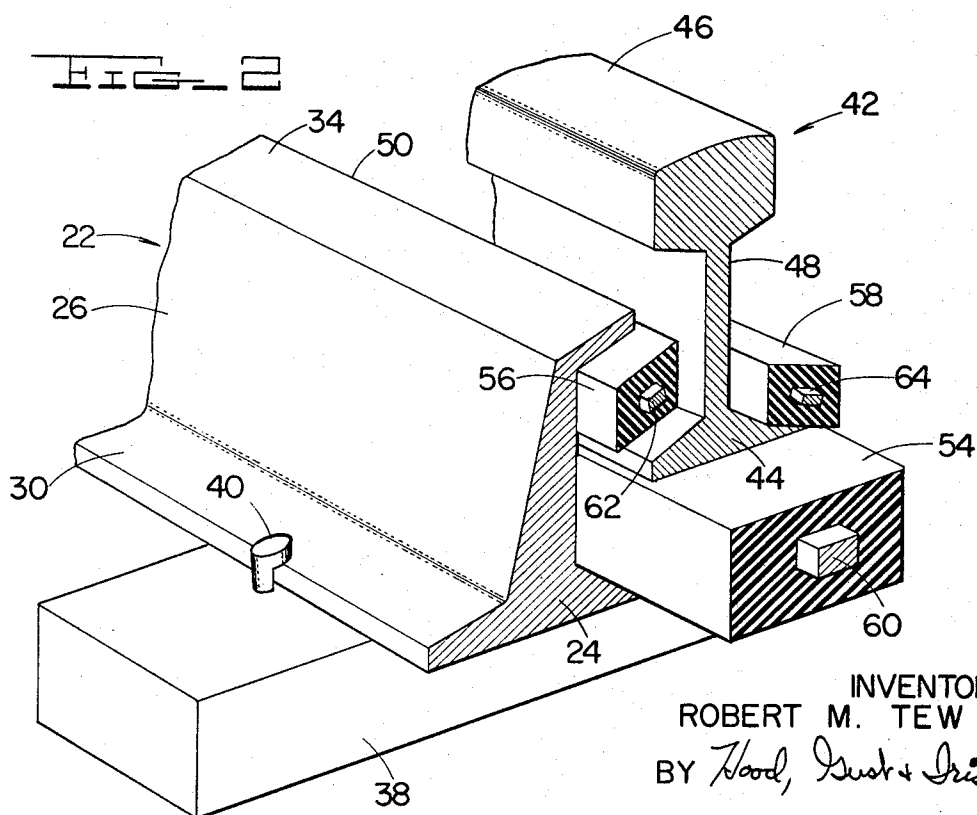
R. M. TEW

3,383,043

RAILROAD TRACK STRUCTURE

Filed Jan. 3, 1967

4 Sheets-Sheet 1



INVENTOR
ROBERT M. TEW
BY *Hood, Gust & Irish*
ATTORNEYS

May 14, 1968

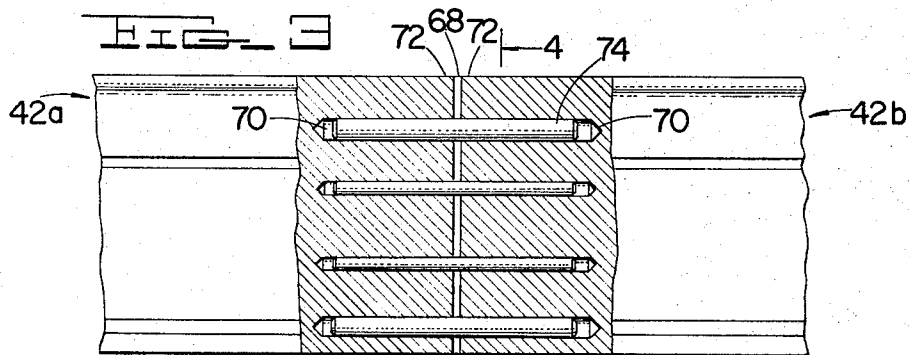
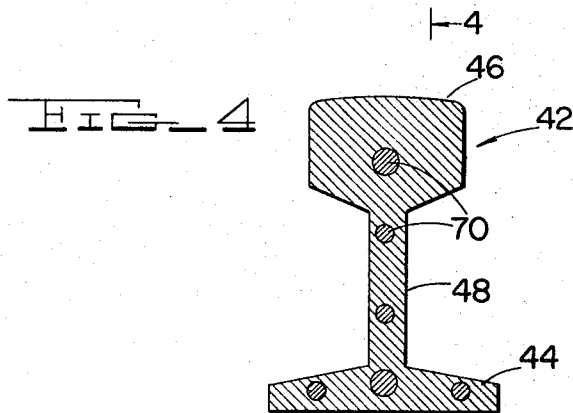
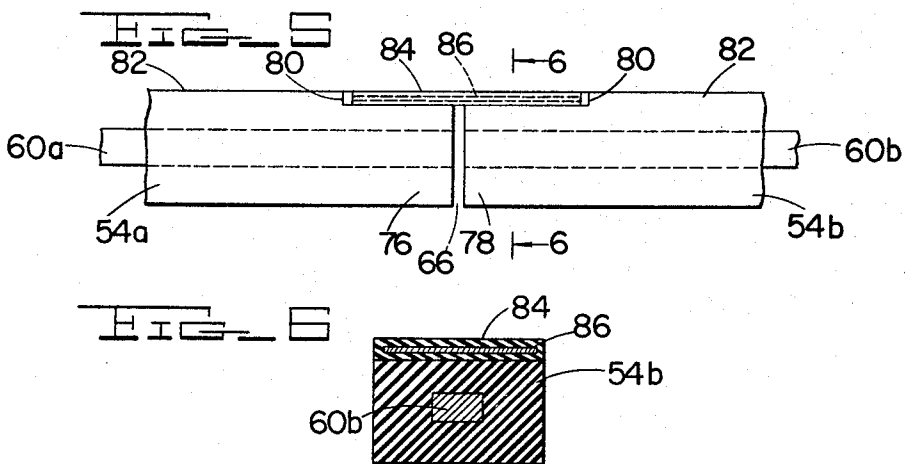
R. M. TEW

3,383,043

RAILROAD TRACK STRUCTURE

Filed Jan. 3, 1967

4 Sheets-Sheet 2



INVENTOR
ROBERT M. TEW
BY *Hard, Saut & Irish*

ATTORNEYS

May 14, 1968

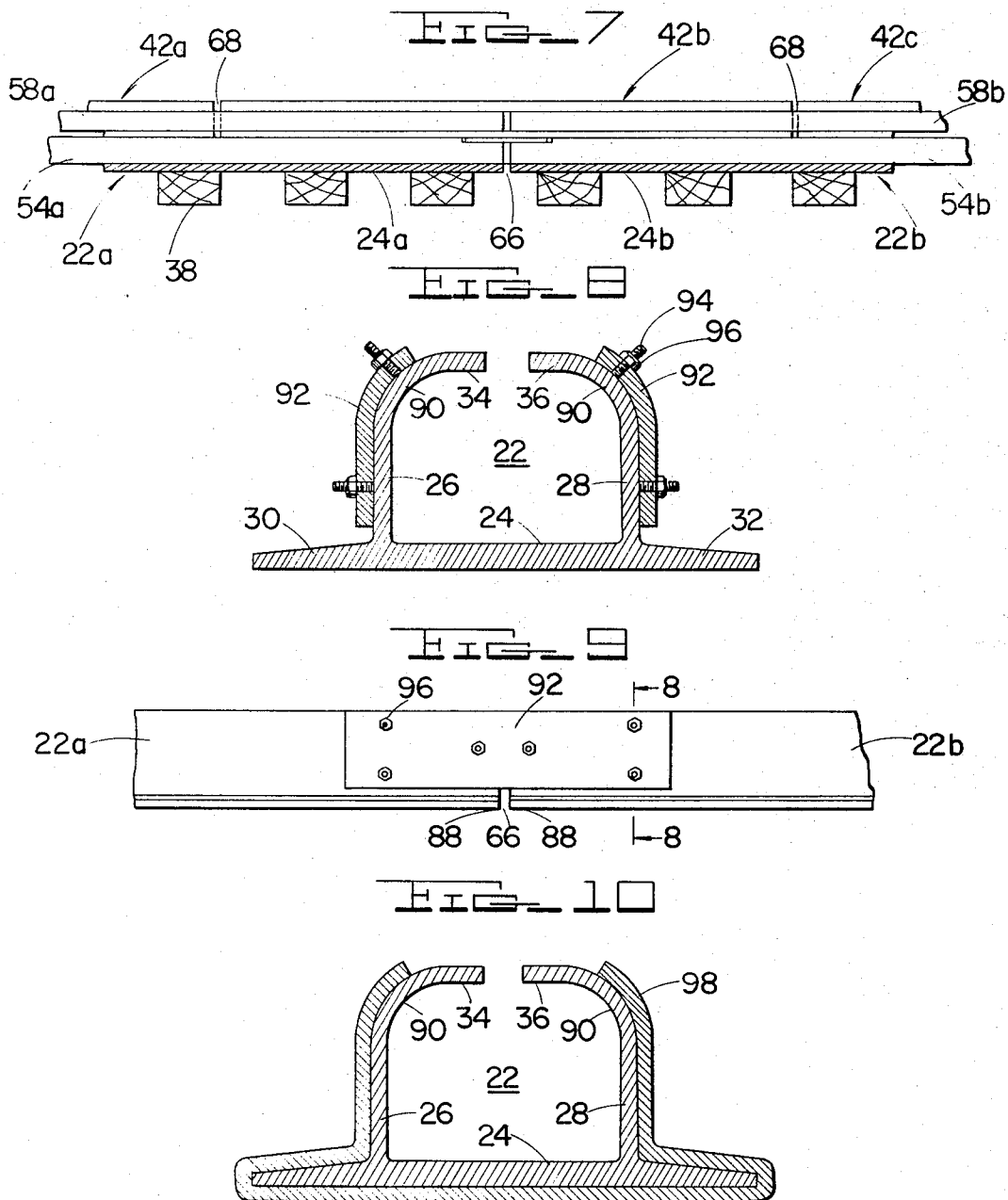
R. M. TEW

3,383,043

RAILROAD TRACK STRUCTURE

Filed Jan. 3, 1967

4 Sheets-Sheet 3



INVENTOR
ROBERT M. TEW
BY *Nood, Gust & Irish*
ATTORNEYS

May 14, 1968

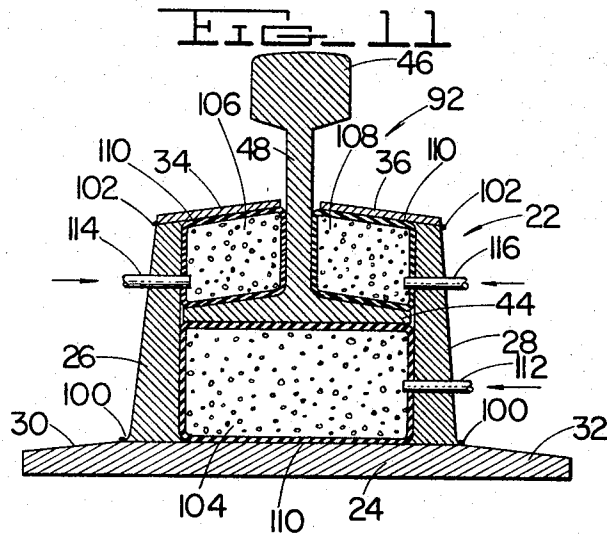
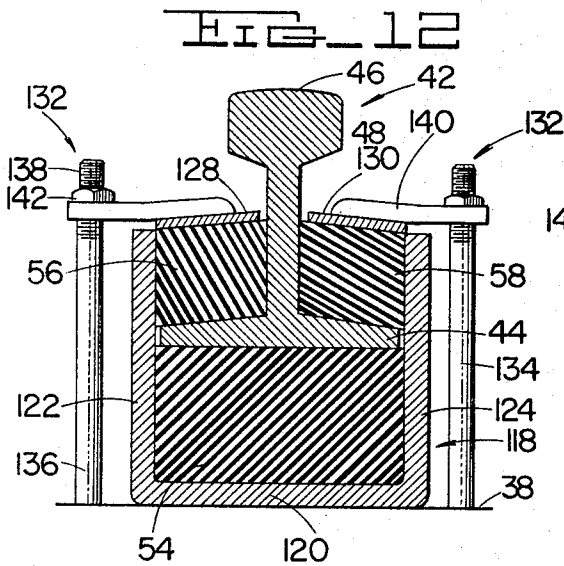
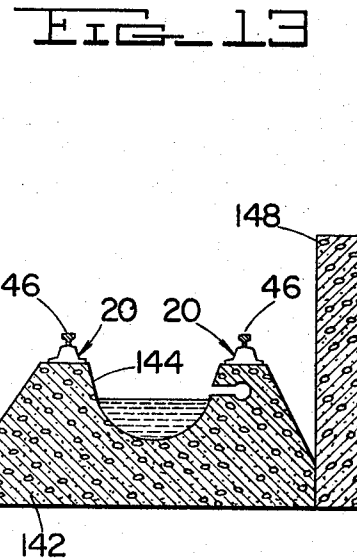
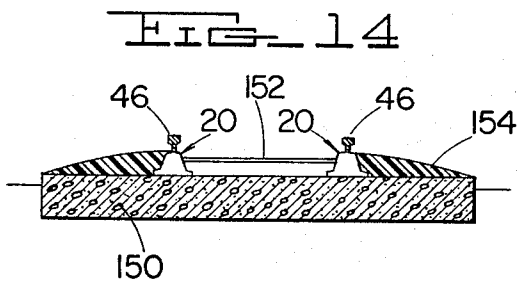
R. M. TEW

3,383,043

RAILROAD TRACK STRUCTURE

Filed Jan. 3, 1967

4 Sheets-Sheet 4



INVENTOR
ROBERT M. TEW
BY *Hood, Duck & Irish*
ATTORNEYS

1

3,383,043
RAILROAD TRACK STRUCTURE
Robert M. Tew, 4020 Leesburg Road,
Fort Wayne, Ind. 46808
Filed Jan. 3, 1967, Ser. No. 606,783
17 Claims. (Cl. 238—283)

ABSTRACT OF THE DISCLOSURE

A railroad track structure providing continuous flotation support for the rails. An elongated, generally channel-shaped member is provided having a bottom wall and upstanding side walls. The base portion of the rail is positioned between the side walls with a part of the web portion and the head portion of the rail projecting upwardly from the channel member. Three elongated compression-flotation members are provided formed of rubber-like material and having a generally rectangular cross-section. One of these members is seated on the bottom wall of the channel member extending between the side walls and supporting the base portion of the rail. The other two members are respectively seated on the upper surfaces of the base portion of the rail extending between the web portion and a respective side wall. Longitudinally extending elements are provided secured to the side walls of the channel member and extending inwardly toward the web portion of the rail, these elements engaging the upper surfaces of the upper two compression-flotation members and continuously maintaining all of the compression-flotation members in compression. Each of the compression-flotation members has an elongated metal core which facilitates initial insertion of the members in the channel member and further contributes equalized control inertia to the flotation assembly.

Specification

This invention relates generally to railroad track structures and more particularly to a continuous flotation support assembly for railroad rails.

Conventional railroad track structures comprise rails spiked to closely spaced wooden ties which are supported by crushed rock ballast. This type of track structure has been in use without change since nearly the advent of railroading itself. The weight of railroad cars and locomotives is supported by spaced trucks, each truck conventionally having two axles. Thus, the weight of the car or locomotive which is distributed to each truck is concentrated on a relatively short length of track. By reason of this concentration of the weight at the two spaced apart trucks, movement of the train along the track causes the rails and the ties attached thereto to move up and down, this upward and downward movement of the ties normally being accommodated and cushioned by the ballast. However, even with relatively low speed train operation, this movement of the track causes shifting of the ballast, tie wear and rail fatigue. Consequently, continuous maintenance is required in order to maintain the track in a safe operating condition. High speed train operation greatly accentuates these conditions to the end that with present conventional track structures, train operation significantly in excess of 100 miles an hour is not practical.

Various forms of cushioning and resilient rail support arrangements have been proposed in an effort to alleviate the above-described conditions. However, such proposed track structures have either been characterized by their complexity and thus expense, and/or have not in fact provided a solution to the problems caused by high speed train operation. It is therefore desirable to provide a track

2

structure which will permit high speed train operation, i.e., at speeds substantially in excess of 100 miles an hour, without the consequent necessity for continuous maintenance and particularly without the necessity for frequent tie and rail replacement and ballast relocation.

It is accordingly an object of the invention to provide an improved railroad track structure which will permit high speed train operation.

A further object of the invention is to provide an improved railroad track structure which will permit high speed operation with minimum track maintenance.

Another object of the invention is the provision of an improved support assembly for a railroad track structure in which the rail is provided with continuous flotation support.

A still further object of the invention is the provision of a rail support assembly wherein the rail is provided with continuous flotation support with equalized controlled inertia.

In accordance with the broader aspects of the invention, a flotation support assembly is provided for a railroad rail which includes first resilient means which engages the bottom surface of the base of the rail substantially throughout its length, and second and third resilient means are provided which respectively engage the outer surfaces of the base of the rail substantially throughout their lengths. Means are provided for normally maintaining all of the resilient means in compression. The resilient means constitute the sole support for the rail providing therebetween continuous flotation support for the base of the rail. In a preferred embodiment of the invention, the resilient means respectively comprise elongated members of semi-solid material, such as rubber-like material, each having a generally quadrilateral cross-section, means are provided for confining these members to prevent their deformation in a direction transverse to the length of the rail.

The above-mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

In the drawings, FIG. 1 is a cross-sectional view showing one embodiment of the invention;

FIG. 2 is a fragmentary view in perspective, partly broken away, further illustrating the embodiment of FIG. 1;

FIG. 3 is a fragmentary side view, partly in cross-section, illustrating a means for forming the rail joint in the structure of the invention;

FIG. 4 is a cross-sectional view taken along the line 4—4 of FIG. 3;

FIG. 5 is a fragmentary side view illustrating a joint between two of the base flotation members of the embodiment of FIGS. 1 and 2;

FIG. 6 is a cross-sectional view taken along the line 6—6 of FIG. 5;

FIG. 7 is a fragmentary side cross-sectional view illustrating a section of track structure incorporating the improved flotation support assembly of FIGS. 1 and 2;

FIG. 8 is a fragmentary cross-sectional view illustrating one method for connecting adjacent shell members of the invention, and further illustrating a slightly modified form of shell member;

FIG. 9 is a fragmentary side view further showing the connecting structure of FIG. 8;

FIG. 10 is a fragmentary cross-sectional view showing another shell member connecting structure;

FIG. 11 is a fragmentary cross-sectional view illustrating another embodiment of the flotation support assembly of the invention;

3

FIG. 12 is a fragmentary cross-sectional view showing yet another embodiment of the invention;

FIG. 13 is a cross-sectional view showing a different type of railroad roadbed structure to which the invention lends itself; and

FIG. 14 is a cross-sectional view illustrating still another type of roadbed construction with which the invention may be used.

Referring now to FIGS. 1 and 2 of the drawing, in one embodiment of the invention, the flotation support assembly, generally indicated at 20, comprises an elongated shell member 22 which has a generally channel-shaped cross-section. Shell member 22 has a bottom wall 24, upstanding side walls 26, 28, outwardly extending bottom flange portions 30, 32, and top flange elements 34, 36 which are joined to the upper extremities of the side walls 26, 28 and extend inwardly therefrom with a slight upward inclination, as shown. Shell 22 may be secured to a conventional wooden tie 38 by means of conventional spikes 40 respectively engaging flange portions 30, 32.

A conventional rail 42 is used with the invention and has a base 44 and a head 46 joined by a web 48. Bottom wall 24, side walls 26, 28 and flange elements 34, 36 of the shell 22 define a cavity within which the base 44 of the rail 42 is positioned. The side edges 50, 52 of the flange elements 34, 36 are transversely spaced apart by a distance greater than the thickness of the web 48 or the rail 42. The upper part of the web 48 projects upwardly through the space defined between the edges 50, 52 with the head 46 of the rail 42 thus being disposed above shell 22. Quite obviously, the base 44 and the bottom part of web 48 of rail 42 must be inserted in the shell 22 from one end thereof.

The base 44 of rail 42 is flotation-supported within shell 22 by means of three elongated resilient members 54, 56, 58. Members 54, 56 and 58 are formed of semi-solid material, such as natural rubber or neoprene, and have resilient characteristics comparable to those provided in rubber elements conventionally employed for mounting and snubbing purposes.

The bottom or base member 54 as supported on the bottom wall 24 of the shell 22, extends between and is confined by the side walls 26, 28, and engages and supports the bottom surface of the base 44. The upper members 56, 58 respectively engage the upper surfaces of the base 44 of rail 42 on either side of web 48, extend between and are confined by the side walls 26, 28 and the web 48 respectively, and engage the top flange elements 34, 36.

Elongated resilient members 54, 56 and 58 prior to installation with the cavity of shell 22 have an uncompressed thickness, which, when added to the thickness of the base 44 of rail 42, is in excess of the height of the cavity defined in shell 22 with the result that, after installation, the elongated resilient members 54, 56, and 58 are maintained in continuous confined compression by the bottom wall 24 and the top flange elements 34, 36 in the vertical direction, and by the side walls 26, 28 in the transverse horizontal direction. Thus, the elongated resilient members 54, 56 and 58 may be deformed only in the longitudinal direction, i.e., in the direction of the length of the rail 42.

The elongated resilient members 54, 56, 58 preferably are respectively provided with elongated metal core elements 60, 62, 64 which facilitate initial insertion of the resilient members in the shell 22, and the subsequent interchangeability of the resilient members, and further provide control of the inertia of the support, as will hereinafter be described.

Prior to the insertion in the shell 22, elongated resilient member 54 has a height or vertical thickness somewhat greater and a width or transverse thickness somewhat less than after installation. Thus, resilient member 54 may readily be inserted in the shell 22 from one end thereof as the first step in the assembly of the structure. Rail 42 is then inserted in the shell 22 from one end thereof so that the base 44 rests upon and is supported by the bottom

4

resilient member 54. The weight of the rail 42 resting upon the bottom resilient member 54 thus partially compresses member 54, but not sufficiently to accommodate the resilient members 56, 58. Sufficient additional weight is then placed upon the head 46 of rail 42 to compress resilient member 54 so that its height or vertical thickness is somewhat less than after the assembly is completed, i.e., sufficiently to provide sufficient clearance to permit insertion of elongated resilient members 56, 58. This compression of the bottom resilient member 54 results in longitudinal deformation thereof by reason of the confinement provided by bottom wall 24, side walls 26, 28 and the base 44 of the rail 42.

Elongated resilient members 56, 58 likewise have an initial uncompressed height or vertical thickness somewhat greater than the normal height dimension between the upper surface of rail base 44 and the flange elements 34, 36, and a width or transverse thickness somewhat less than the transverse spacing between the inner surfaces of side walls 26, 28, and web 48, respectively. Downward compression of the bottom elongated resilient member 54 by the weight applied to rail 42 provides a vertical dimension between rail base 44 and the flange elements 34, 36, sufficiently greater than the uncompressed vertical thickness of elongated resilient members 56, 58 to permit their insertion. Members 56, 58 are then inserted from one end of the shell 22 and when properly positioned, the weight is removed from the rail 42. The resultant upward movement of rail 42 with removal of the weight will result in compression of the elongated resilient members 54, 56 and 58 and their longitudinal deformation by reason of the confinement provided by base 44, side walls 26, 28, top flange elements 34, 36 and the rail web 48. It will be readily apparent that the weight applied to the rail 42 to permit insertion of the elongated resilient members 56, 58, as above described, must be greater than any weight which would be applied thereto by a train since, in accordance with the invention, the elongated resilient members 54, 56, and 58 must at all times be in compression in order to provide the requisite flotation support for the rail 42.

It will now be observed that the elongated resilient members 54, 56, 58 constitute the sole support for the rail 42. It will further be seen that the weight or downward force exerted on the rail 42 by a train thereon tends to compress further the bottom resilient member 54, accompanied by corresponding expansion of the top resilient members 56, 58. However, due to the confinement of the resilient members, any compression of resilient member 54 must be accompanied by corresponding longitudinal deformation, i.e., elongation. However, the elongated resilient members 54, 56, 58 have substantial length, preferably the same as the length of a conventional rail, i.e., 40 feet. Thus, any longitudinal elongation of any of the resilient members 54, 56, 58 resulting from the application of further compressive force is resisted by the internal friction of the material, i.e., there is substantial inertia resisting such longitudinal deformation. The metal core members 60, 62, 64 contribute further resistance to such longitudinal elongation and thus serve to control this inertia, i.e., the size and cross-sectional configuration of the metal cores 60, 62, 64 control the inertia. Therefore, as a wheel rolls at high speed along the rail 42 thus continuously and progressively applying a downward compressive force on the bottom elongated resilient member 54, longitudinal elongation as the result of the progressive compressive force is resisted and, likewise, after passage of the wheel, compression and resultant longitudinal elongation of the top resilient members 56, 58 during return of the rail to its normal position is likewise resisted. Resultantly, with the continuous flotation support of the rail and the controlled equalized inertia provided by the elongated resilient members 54, 56, 58, deflection and thus fatigue of the rail due to high speed operation thereon is very substantially reduced, thus in turn increasing rail

5

life and safety. Further, movement of the entire track structure is substantially reduced and tie life substantially increased.

Referring now to FIGS. 3 through 8, the support assembly 20 is preferably provided in lengths equal to the length of a rail, however, the joint 66 between adjacent shell members 22a and 22b arranged in end-to-end relationship is preferably disposed substantially midway between the ends of a rail 42b, i.e., with the joint 68 between the adjacent rails 42a and 42b being midway between the ends of the shell 22a, and the joint 68 between adjacent rails 42b and 42c being midway between the ends of the shell 22b (FIG. 7). The ends of the elongated resilient members 54, 56 and 58 are preferably co-extensive with the ends of the shell 22. However, it will be readily understood that they need not be co-extensive and, in fact, the ends of the elongated resilient members may alternatively be arranged to be co-extensive with the ends of a rail.

Referring now to FIGS. 3 and 4, the elongated top resilient members 56, 58, preclude the use of the conventional tie plates for connecting adjacent rail ends. Thus, in accordance with the invention, a plurality of longitudinally aligned openings 70 are drilled or otherwise formed in the rail ends 72 with pins 74 being slidably received therein, thereby to hold the adjacent rails 42a, 42b in alignment, while still accommodating expansion and contraction of the rails.

Referring now to FIGS. 5 and 6, the ends 76, 78 of adjacent elongated resilient members 54a, 54b must be longitudinally spaced apart forming joint 66 in order to accommodate the longitudinal elongation under compression, as above-described. It will be readily understood that the ends of adjacent top elongated members 56, 58 must likewise be longitudinally spaced apart to accommodate such longitudinal elongation. In the case of the bottom elongated resilient member 54, it is desirable to bridge the joint 66 between adjacent members 54a, 54b. In order to provide this bridging, recesses 80 are formed in the top surfaces 82 extending longitudinally from the ends 76, 78 of elongated members 54a, 54b and a plate member 84 is seated in the recesses 80. Plate member 84 is preferably formed of semi-solid resilient material, such as rubber or neoprene and has a metal core member 86 therein. It will be readily seen that the overall length of the plate member 84 must be slightly less than the combined lengths of the recesses 80 in order to accommodate the above-referred to elongation of the bottom resilient members 54a, 54b in response to compressive forces.

Referring now to FIGS. 8 and 9, an arrangement is shown for connecting the ends 88 of adjacent shell members 22a, 22b at the joint 66. FIG. 8 also illustrates a shell 22 having a slightly modified cross-sectional configuration in which the top flange elements, 34, 36 are joined to the side walls 26, 28 by a smoothly curved radius portion 90 as shown. In order to connect the adjacent shell sections 22a, 22b, plate members 92 are provided bridging the joint 66 and connected to the side walls 26, 28 by suitable studs 95 with nuts 86 threaded thereon. Stud 94 being secured to the outer surfaces of the side walls 26, 28 in any suitable manner, as by welding, and projecting outwardly therefrom.

Referring to FIG. 10, another form of connection between adjacent shell sections 22 is shown in which a sleeve member 98 is provided embracing the adjacent shell sections 22a, 22b and bridging the gap 66. Sleeve member 98 may be attached to the adjacent shell members 22 by suitable studs, as shown in FIGS. 8 and 9, or may be welded thereto.

Referring now to FIG. 11, in which like elements are indicated by like reference numerals, while the shell member 22 of the previous figures has been shown as being integrally formed, as by extruding, it will be readily understood that the shell member 22 may be fabricated

6

with the side walls 26, 28 being secured to the bottom wall 24, as by welding at 100, and with the top flange elements 34, 36 likewise being welded to the side walls 26, 28, as at 102.

With this embodiment, the elongated resilient members take the form of elongated open celled members 104, 106, 108 respectively having fluid-impervious coatings 110 thereon, the compressive forces being provided by inflation of the members by a suitable fluid under pressure. Here, conduits 112, 114, 116 respectively extend through the side walls 26, 28 and communicate with the resilient members 104, 106, 108, serving to introduce fluid under pressure, such as compressed air or water to the interior of the members, thus, in essence to inflate the same and provide the initial continuous compressive force above-described.

Referring now to FIG. 12, in which like elements are again indicated by like reference numerals, a different form of shell member 118 is provided having a channel-shaped cross-section with a bottom wall 120 and upstanding side walls, 122, 124. It will be observed that in this embodiment, shell member 118 is initially open at the top thus permitting insertion of the elongated resilient members and the rail from the top rather than from an end as in the case of the embodiment of FIGS. 1 and 2. Here, the bottom elongated resilient member 54 is seated on the bottom wall 120 engaging and compressed between the side walls 122, 124 and supporting the base 44 of the rail 42. The top elongated resilient members 56, 58 are positioned in engagement with the upper surfaces of the base 44 of the rail 42 and engaging the side walls 122, 124 and the web 48, respectively. The upper part of web 48 and the head 46 of the rail 42 again project upwardly above the shell 118.

In order to provide the requisite continuous compression of the elongated resilient members 54, 56, 58 and the resultant continuous flotation of the rail 42, a pair of elongated elements 128, 130 are provided engaging the upper surfaces of the top elongated resilient members 56, 58. A plurality of longitudinally spaced-apart clamping assemblies 132, are provided secured to the track structure, such as the ties 38, and engaging the elements 128, 130 so as to apply the requisite compressive force to the elongated resilient members 54, 56, 58. More particularly, each of the clamping assemblies 132 comprises a rod member 134 having its lower end 136 suitably secured to the tie 38 and having its upper end 130 threaded, as shown. A clamping arm 140 is mounted on the upper end 138 of the rod 134 and moved downwardly into the requisite compressive position by means of a suitable nut 142.

While I consider provision of the elongated metal cores 60, 62, 64 in the elongated resilient members 54, 56, 58 to be desirable, they may in certain instances be eliminated, as shown in FIG. 12. It will be readily understood that the embodiment of FIG. 12 functions in a manner substantially identical to the previous embodiments.

Referring now to FIG. 13, the improved flotation support assemblies 20 of the invention, above described, may be used in connection with a track structure and roadbed other than the type employing conventional wood ties. Thus, the support assemblies 20 may simply be mounted as by bolting, to a suitable concrete roadway 142 having a trough 144 formed between the rail support assemblies 20 which may accommodate water for braking purposes or alternatively carry power and communications cables, or a third rail in the case of an electrified railway. Trough 144 may also have longitudinally spaced, transversely extending reaction plates therein for use in jet train propulsion, i.e., with the jet engine of the power car exhausting downwardly into trough 144. In order to facilitate high speed operation, upstanding wall structures 146, 148 are desirably provided on either side of the roadbed 142 in order to inhibit the effect of cross winds upon the train.

Referring now to FIG. 14, a railroad track structure utilizing the improved flotation support assemblies 20 of the invention may be laid upon a conventional highway comprising a concrete slab 150. Here, a plurality of spaced-apart tie rods 152 may be provided connecting the support assemblies 20. Suitable paving material 154 may be applied between the support assemblies 20 and the side extremities of the slab 150, and may also be applied between the support assemblies 20 (not shown).

It will now be readily seen that my invention provides a rail support assembly which, by virtue of the continuous flotation support of the rail, will permit continuous high speed train operation with increase in rail life and a reduction in tie wear and track maintenance.

While there have been described above the principles of this invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of the invention.

What is claimed is:

1. In a railroad track structure: a rail having head and base portions connected by a web portion; said base portion having a bottom surface and top surfaces respectively on either side of said web portion; and a flotation support assembly for said rail including first resilient means engaging said bottom surface of said rail base portion substantially throughout its length, second and third resilient means respectively engaging said top surfaces of said rail base portion substantially throughout their lengths, and means for normally maintaining all of said resilient means in compression, said resilient means being the sole support for said rail and providing therebetween continuous flotation support for said base portion thereof.

2. The structure of claim 1 wherein said resilient means respectively comprise elongated members of semi-solid material each having a generally quadrilateral cross-section, said second and third members having inner side surfaces respectively engaging said rail web portion.

3. The structure of claim 2 wherein said compression maintaining means includes means for confining said members and preventing deformation thereof in a direction transverse to the length of said rail.

4. The structure of claim 2 wherein said compression maintaining means includes a pair of elongated elements respectively engaging the upper surfaces of said second and third elongated members substantially throughout their lengths, said elements being spaced transversely from said rail web portion, a part of said rail web portion and said rail head projecting upwardly above said elements, and means for applying downward force on said elements thereby to maintain said members in compression.

5. The structure of claim 2 wherein said compression maintaining means includes a generally channel-shaped member having a bottom wall and upstanding side walls, said elongated members and said base portion being substantially disposed within said channel-member, a part of said rail web portion and said rail head projecting upwardly from said channel member, said channel member side walls respectively engaging the outer side surfaces of said elongated members and confining the same thereby preventing deformation thereof in a direction transverse to the length of said rail.

6. The structure of claim 4 wherein said channel member includes a pair of elements respectively joined to said side walls and extending inwardly therefrom toward said rail web portion, said elements respectively engaging the upper surfaces of said second and third elongated members and applying said compression thereto, said elements being spaced transversely from said rail web portion, a part of said rail web portion and said rail head projecting upwardly above said elements.

7. The structure of claim 4 wherein said bottom wall of said channel member is adapted to be supported on an

element of said track structure, and wherein said compression maintaining means further includes a pair of elongated elements respectively engaging the upper surfaces of said second and third elongated members substantially throughout their lengths and being spaced transversely from said rail web portion, a part of said rail web portion and said rail head projecting upwardly above said elongated elements, and means adapted to be secured to said track structure element and respectively engaging said elongated elements for applying downward force thereon thereby to maintain said elongated members in compression.

8. The structure of claim 2 wherein each of said elongated members has an elongated core element therein formed of metal, each of said core elements extending through the length of its associated elongated member.

9. The structure of claim 2 wherein each of said elongated members is formed of cellular material.

10. The structure of claim 9 wherein each of said elongated members includes substantially fluid-impervious coating means, and wherein said compression maintaining means includes means for admitting a fluid under pressure to the interior of said elongated members.

11. The structure of claim 1 wherein there are two of said support assemblies, each of said support assemblies being longitudinally elongated in the direction of the length of said rail, said assemblies being arranged in end-to-end relationship defining a joint therebetween, said joint being intermediate the ends of said rail.

12. The structure of claim 11 wherein said resilient means of each of said assemblies respectively comprises longitudinally elongated members of semi-solid material, said compression maintaining means of each of said assemblies including means for confining the respective elongated members and preventing deformation thereof in a transverse direction, the ends of each of said elongated members of each of said assemblies at said joint being longitudinally spaced apart thereby to permit longitudinal deformation thereof.

13. The structure of claim 12 wherein said confining means of each of said assemblies comprises an elongated generally channel-shaped member having a bottom wall and upstanding side walls, said elongated members of each of said assemblies and said rail base portion being substantially disposed within said channel members, a part of said rail web portion and said rail head projecting upwardly from said channel members, said side walls of said channel members respectively engaging the outer side surface of said elongated members and confining the same thereby preventing said transverse deformation, and further comprising plate members secured to each of said side walls and respectively bridging said joint for connecting said assemblies.

14. The structure of claim 12 wherein said first elongated members of each of said assemblies has an upper surface engaging said rail base portion, each of said first elongated members having a recess formed in its upper surface extending longitudinally from its end at said joint, and further comprising a plate member seated in said recesses and bridging said joint.

15. The structure of claim 14 wherein said plate member is formed of semi-solid resilient material with a metal core.

16. The structure of claim 1 wherein there are two of said rails arranged in end-to-end relationship and defining a joint therebetween, said assembly being longitudinally elongated in the direction of the length of said rail, said rail joint being intermediate the ends of said assembly.

17. The structure of claim 16 wherein each of said rails has at least one longitudinally extending opening formed in its end at said joint, said openings being in longitudinal alignment, and further comprising a pin slidably seated in said openings and bridging said joint.

References Cited

UNITED STATES PATENTS

3,298,607	1/1967	Groff	238—243
3,268,170	8/1966	Moses	238—283
3,189,279	6/1965	Horniblow et al.	238—283
2,670,136	2/1954	Moses	238—283
2,553,010	5/1951	Saul	238—283
2,162,599	6/1939	Austin et al.	238—283
1,119,580	12/1914	Dithmer	238—25
878,588	2/1908	Wolhaupter	238—155

223,052	12/1879	Mack	238—283
218,853	8/1879	Blake	238—283
208,880	10/1878	Atwood	238—382

OTHER REFERENCES

Railway Gazette, July 18, 1958, p. 47, copy available in Group 317, Class 238/283.

ARTHUR L. LA POINT, *Primary Examiner.*

R. A. BERTSCH, *Assistant Examiner.*

**UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION**

Patent No. 3,383,043

May 14, 1968

Robert M. Tew

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 7, lines 65 and 74, claim reference numeral "4", each occurrence, should read -- 5 --.

Signed and sealed this 10th day of March 1970.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents