

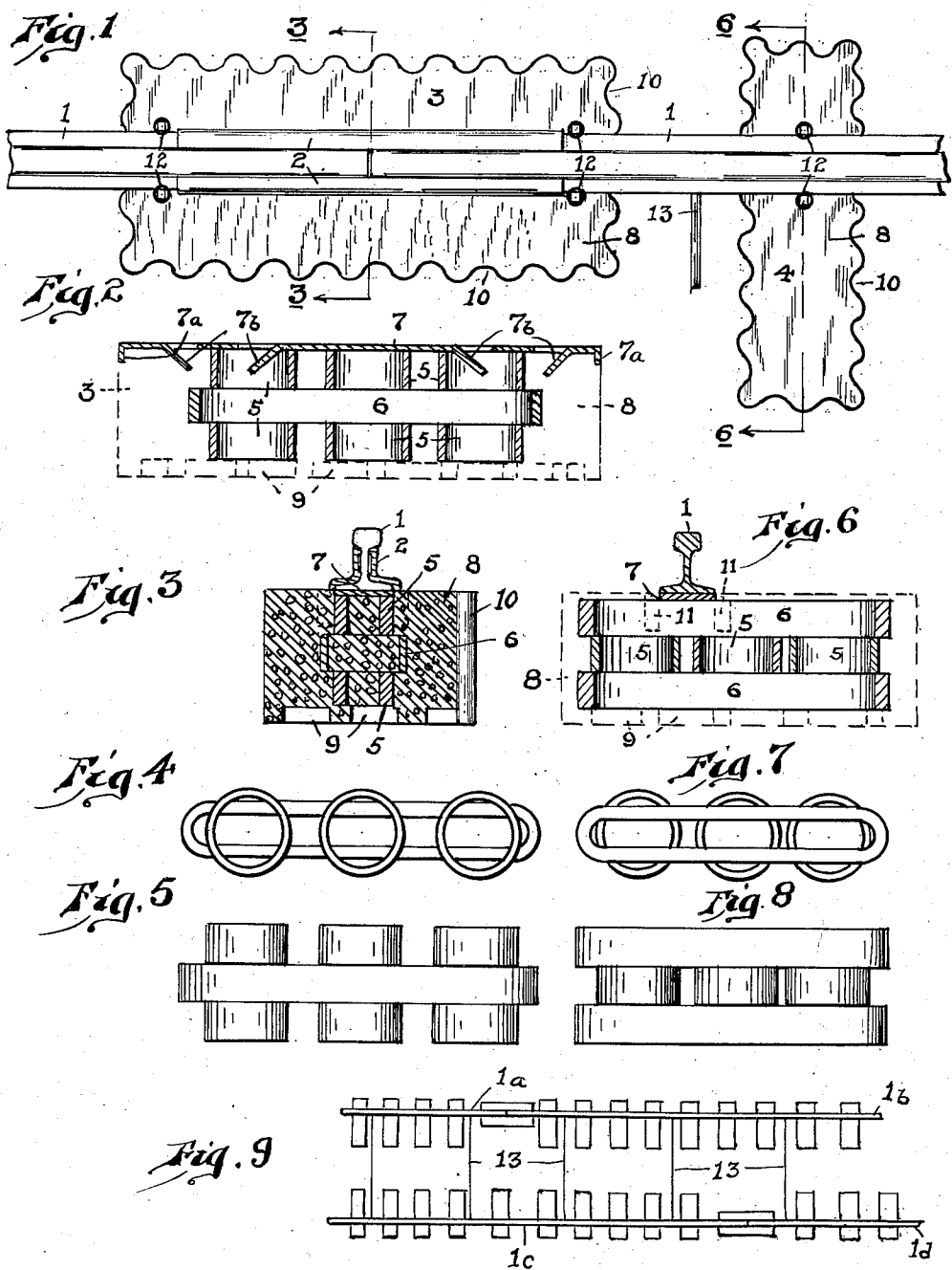
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RAILWAY TRACK STRUCTURE

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RAILWAY TRACK STRUCTURE

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More particularly my invention relates to that type of track structure in which the supports of the rails are individual to the rails in that they do not bridge the space between the parallel rails.

5 In modern practice these supports are usually formed of concrete or like material and are provided with metallic reinforcement, and it is to the improvement in the character and structure of such supports that one phase of my invention relates. Most of the prior art relating to such individual rail supports is characterized by the use of the metal element or elements merely to reinforce the concrete body of the support against such strains and stresses which the concrete is less able to resist.

Where the metal is used merely to reinforce the concrete, the latter tends to smash, wear, crack and fracture under the burden of travelling loads.

10 In the case of my invention the actual support of the rail is provided by the metallic skeleton of the rail-support, while the concrete body functions to protect the skeleton against atmospheric deterioration, keeps the elements of the skeleton in proper position under loads, provides an anchorage for the support in the ballast or other material of the roadbed, and supplies the necessary weight for an efficient floating rail anchorage.

20 In my improved rail supports, the metallic skeleton comprises superimposed strata of rings and elongated loops of steel, the rings and loops alternating in vertical arrangement and resting upon each other, and the rail bears upon a plate of manganese or other steel of superior wear-resisting and nonoxidizing qualities, which plate is directly supported by the metallic skeleton. Thus the load is carried directly by the metallic skeleton and is transferred thereby to the road bed.

30 The rings and loops are formed of flat or plate material and their axes are vertically disposed, thus utilizing their greatest strength and stiffness and also enabling them to enclose portions of the concrete mass and by the relation of the rings and loops to "stitch" the mass of concrete into an integral reinforced whole.

40 Again the open character of the rings and loops provides for the free flow of concrete when the latter is cast in the molds, so that a complete and uniform filling of the mold is effected.

50 Another phase of my invention consists of a new and improved parallel rail railway in which the parallel rails are individually supported by joint and intermediate supports in a novel manner.

55 Other novel features of construction and also

of arrangement of track-elements, will appear from the following description.

In the accompanying drawing, wherein I have illustrated a practical embodiment of the principles of my invention, Fig. 1 is a plan view showing adjoining portions of two alined rails with one of my improved joint-supports for the rail joint and also one of my improved intermediate supports under one of the rails.

Fig. 2 is a longitudinal vertical section of the joint-support shown in Fig. 1.

Fig. 3 is a cross sectional view of the same taken along the line 3-3 in Fig. 1.

Fig. 4 is a plan view of the metallic skeleton of the joint-support.

Fig. 5 is a side elevation of the same.

Fig. 6 is a sectional view of the intermediate support taken along the line 6-6 in Fig. 1.

Fig. 7 is a plan view of the metallic skeleton of the same.

Fig. 8 is a side elevation of such skeleton.

Fig. 9 is a plan view on reduced scale showing a section of railway track to which the principles of my invention are applied.

Referring first to Figs. 1 to 8, inclusive, I represent two alined railway rails which are connected at their joint by the usual fish-plates 2. Supporting the joint is one of my longitudinally disposed joint-supports 3, while shown as supporting an adjacent portion of the right hand rail is one of my transversely disposed intermediate supports 4.

Referring first to the joint-support 3, the same is provided with a metallic skeleton comprising alternately arranged and superimposed strata of rings 5 and an oblong closed loop 6. Such loop and rings are preferably formed of flat plate material and placed with their axes vertical to obtain full benefit of the greatest strength and stiffness. In the case of the joint-support 3 the rings 5 are at the top and bottom with the loop 6 in the center, while in connection with the intermediate support 4 the loops are at the top and bottom and the rings in the center. The upper or top series of rings in the case of the joint-support, provide an undersupport for the steel rail plate 7 upon which the bases of the rails bear directly. This plate is of wear-resisting and nonoxidizing steel, preferably manganese steel, and has a flat top surface to receive the rails in flat surface contact.

When the joint-support is formed it is cast upside down in a suitable mold, the rail plate 7 being inverted in the bottom of the mold. A row of rings 5 is laid on the plate 7 and the loop 6 is

then placed on the rings. The second row of rings 5 is then placed in position on the loop 6 and the concrete is then cast into the mold. The body of concrete is indicated at 8.

5 The rail plate 7 is provided with downturned ends 7a which are flush with the end of the concrete mass and is also provided on its bottom surface with spurs 7b which are embedded in the concrete and thus anchor the plate permanently to the concrete. These spurs may be welded or otherwise attached to the under side of the plate 7 or may be cut and struck down from the material of the plate. The plate is usually made of the same width as the base of the rail but may be slightly wider, if desired. It will be noted that the rails do not contact with the concrete.

When the mold is filled with concrete a lid is pressed down thereon, the underside of the lid being provided with a grid which may be like the inner surface of a waffle-iron so that an indented or "waffled" surface, as indicated at 9, aids in anchoring the support to the roadbed. The metallic skeleton extends down to just above the outer surface of the recesses of the lower surface of the support, the concrete covering the metal to prevent its deterioration by exposure without materially undersupporting the metallic skeleton.

The perimetral edges of the support are irregular or fluted as indicated at 10 to aid in anchoring the support in the ballast or material of the roadbed.

By providing the mold with properly shaped, removable sides and ends such contouring may be easily imparted.

35 In the case of the intermediate support 4 the rail plate 7 is transversely disposed and is directly supported by the top loop 6 which in turn is supported by the rings 5 which rest upon and are supported by the bottom loop 6, all being embedded in the concrete body 8 having fluted sides and ends and a "waffled" bottom.

The rails may be attached to the supports in any convenient manner, as the specific means for rail attachment does not form a part of my present invention.

45 Thus I have for the sake of illustration shown vertically disposed sockets 11 embedded in the concrete 8 in proper positions to receive the rail engaging elements 12 which may be bolts with washers or clamps which overlap the sides of the base of the rails.

The joint-supports 3 are disposed longitudinally of the rails to prevent "pumping" of the joints and "cupping" of the ends of the rails. To counteract tipping the rails are offset somewhat toward the outer edge of the joint-support. Thus in practice I have found that a ratio between the distance from the longitudinal center of the rail to the outer edge of the support, the upper edge in Fig. 1, and the distance between said center line and the inner edge of the support, the lower edge in Fig. 1, of 1.2 to 1.55 eliminated any tendency toward inward tipping of the support under passing traffic. For standard railway construction, such as say 100 pound rails, I found the joint-support of a length of approximately thirty-nine inches, a width of eighteen inches and a depth of six inches was quite satisfactory.

Referring now to the intermediate supports, 70 which is illustrated at 4 in Fig. 1, the same are placed transversely on the rail with a greater area at the inner side of the rail than the outer side of the rail to prevent transverse tipping. I have found in practice if the area at the inner side of the rail, the lower side in Fig. 1, is 1.35

times the area or length of the outer side, tipping is avoided.

In the case of the supports 4 I prefer to form the skeleton of the support by placing a loop 6 at the top and bottom and interposing the rings 5 between the loops. The rail plate 7 is placed transversely of the support. The sides and ends of the support are fluted and the bottom of the support is provided with a "waffled" surface as in the case of the joint supports. These supports may conveniently be of a width of about twelve inches, of a length of about thirty inches, and a depth of about six inches.

In installing the track for the use with my supports I employ the arrangement illustrated in 15 Fig. 9, wherein one side of the track is composed of the alined rails 1a and 1b, while the other side of the track is composed of the alined rails 1c and 1d. The rails are supported at their joints by the longitudinal joint-supports 3 while the intermediate portions of the rails are supported by the transversely disposed supports 4. The supports 4 are placed at about eighteen inch centers and about eighteen inches or two feet space intervenes between the ends of the supports for the opposite rails. At proper intervals the opposite rails are connected by suitable means, such as the tie rods 13 which may be mechanically connected to the rails or may be welded to their flanges so as to accurately maintain the gauge. In the case of electrified steam roads the tie rods are insulated so that the rails are not electrically connected.

It is obvious that my invention provides a substantial, efficient and relatively permanent railway track structure.

It is to be noted that in my improved rail supports the load is supported by the steel and not by the concrete, of which latter a minimum is thus employed.

The concrete functions in providing a stable anchoring of the support in the ballast or roadbed and as a bond to hold the metallic elements in position so that they may not shift under loads. The concrete also acts as a protector to the metallic elements to prevent their exposure to the weather and to dampness.

Again, by virtue of the metallic support in contact with the rail, the "summer heat" in the rail is carried off to the earth, and thus dissipated, maintaining normal temperature in the rail and preventing expansion and tendency to buckle.

The longitudinal disposal of the joint-supports prevents "pumping" joints and "cupped" rail ends.

The offsetting of the joint-supports and of the intermediate supports counteracts any tendency to inward tilting.

By the placing of the intermediate supports transversely of the rail and having the supports for the opposite rails entirely disconnected a perfect balance of the rail support is effected and the tendency of the entire track structure to tip is avoided.

The tie rods are placed between the rail supports and as close together as will be found necessary, more being employed on curves than on tangents.

I claim:—

1. In a track support for railway rails, the combination of a supporting structure comprising superimposed strata of metal rings and oblong loops, a metal plate supported from beneath by said structure and secured thereto, the

rail being supported by said plate, and a covering and filling of concrete for the rings and loops to form a rigid mass.

2. A track support for railway rails comprising a metal plate upon which the base of the rail rests and a metal supporting structure for the plate comprising super-imposed strata of metal rings and oblong loops, and a covering and filling of concrete for the rings and the loops to form a rigid mass, the concrete covering for the bottom of the metal structure being made relatively thin, so as to protect the metal against rust while permitting the load to be conveyed by the metal structure from the rail to the ground without material intervention of the concrete.

3. A track support for railway rails comprising a plate upon which the base of the rail rests, and a supporting structure for said plate comprising superimposed strata of metal rings and oblong loops, the structure being embedded in a body of concrete, the perimetral edges of the concrete body being deformed to improve its anchorage in the roadbed.

4. A track support for railway rails compris-

ing a plate upon which the base of the rail rests, a metallic support for said plate comprising super-imposed strata of metallic rings and oblong loops, and a body of concrete in which the metallic structure is embedded, the metallic support being centered under the rail while the concrete body is extended further toward the center of the track on the inside of the rail than it is beyond the outer side of the rail, whereby to prevent inward tipping.

5. An intermediate track support for railway rails comprising a metal plate disposed at right angles to the rail and upon which the base of the rail rests and to which the rail is fastened, a metallic supporting structure for said plate comprising super-imposed strata of rings and loops, said structure being embedded in concrete, and the rail resting on the plate and being fastened thereto nearer the outer end of the plate than it is to the inner end toward the center of the track, whereby to prevent inward tipping of the rail.

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