No. 853,209. PATENTED MAY 14, 1907.

J. N. AKARMAN.

RAILWAY RAIL.

APPLICATION FILED JUNE 1, 1906.

2 SHEETS—SHEET 1.

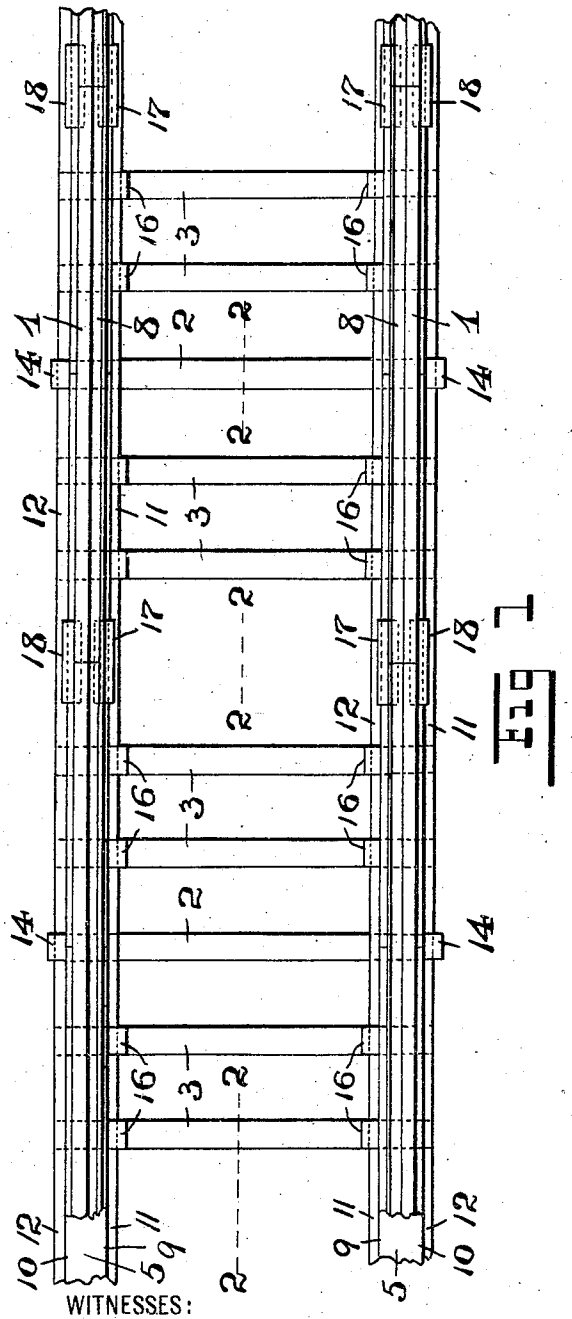

Fig 1

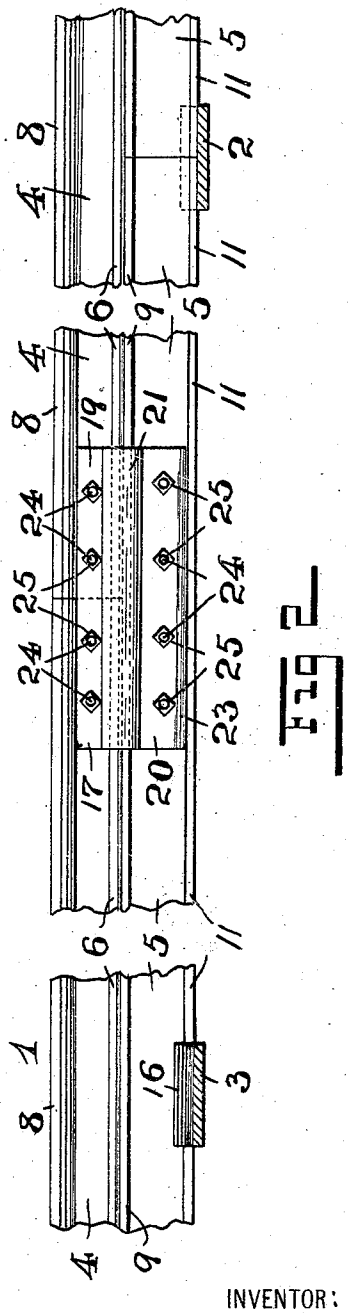

Fig 2

WITNESSES:

Frederick Jamison

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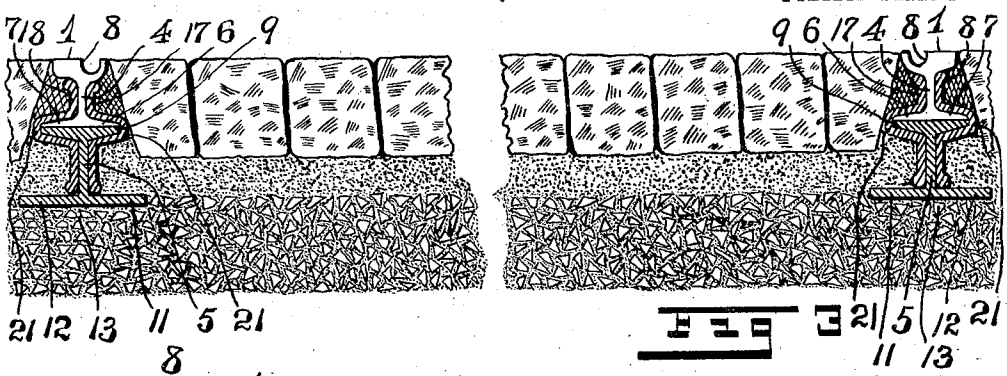

Fig 3

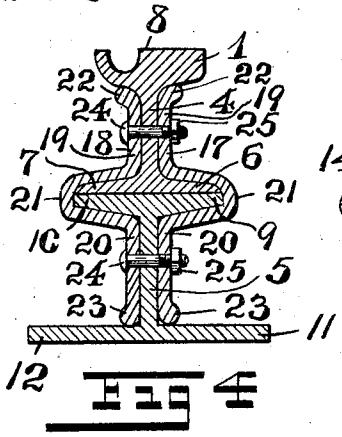

Fig 4

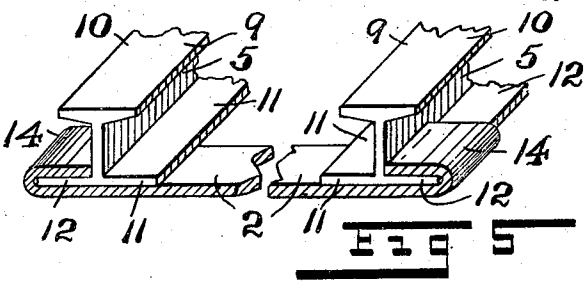

Fig 5

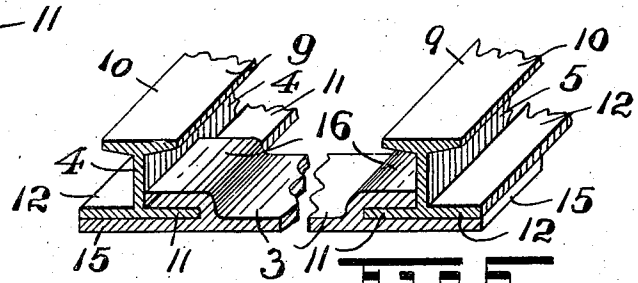

Fig 6

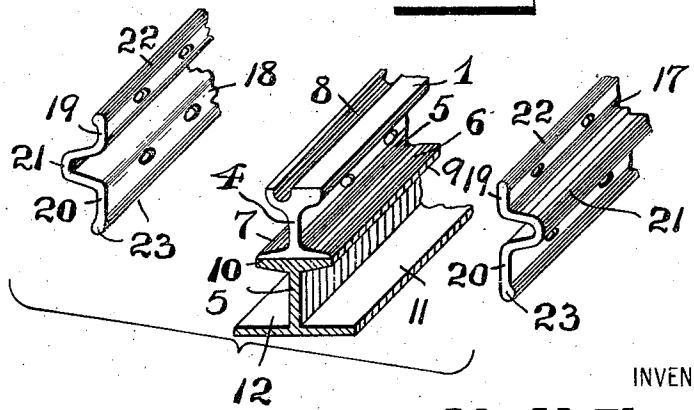

Fig 7

WITNESSES:

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UNITED STATES PATENT OFFICE.

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RAILWAY-RAIL.

No. 853,209. Specification of Letters Patent. Patented May 14, 1907.

Application filed June 1, 1906. Serial No. 319,663.

To all whom it may concern:

Be it known that I, JOHN N. AKARMAN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Railway-Rails; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has reference, generally, to improvements in rail-construction for railways; and relates, more particularly, to a novel construction of rail which is especially adapted for electric railways.

The invention has for its principal object to provide a cheap and effective form of rail-construction; and the said invention consists, essentially, in a novel arrangement and construction of a girder rail made in two parts, preferably, by clamping or fastening two longitudinal beams, or girders together; the top portion, or section of the upper girder, forming the head of a railway rail, and the lower section, or girder, forming the base of the railway rail.

The upper and lower sections, or girders, are held together at all joints, and also at frequent intervals, by means of plates placed on opposite sides of the two sections, or girders, the upper portion of the plate being against the "web" of the upper section, or girder, and the lower portion of the plates being against the "web" of the lower section, or girder, and that part of the plates, passing around the base of the upper section and top of the lower section, which base of upper section and the top of lower section when placed together form a wedge, being tapered; so that the plates when fastened together by bolts passing through the upper and lower sections and the respective upper and lower "webs" of the girders, when drawn together, press the base of the upper section, or girder, and the head of the lower section, or girder, together; making firm contact, so that by breaking, or staggering, the joints of the upper and lower sections, or girders, a continuous metallic rail will be produced, by means of which complete metallic conductivity will be established for the purpose of forming the negative, or return-conductor necessary in electric railway practice.

A further object of this invention is to lessen the cost of maintenance, as the upper or wearing section of the rail can be removed from time to time, as it becomes worn and a new upper rail-section substituted therefor at much less cost than if the rail had been removed in its entirety, which is now the case in the present railway practice, where the whole rail has to be renewed as soon as its wearing-portion becomes unfit for use.

A further additional advantage of my invention is that my novel arrangement and construction forms a continuous rail for the passage of cars over it, the upper rail-sections, where they are joined or butted together, being midway of the lower and supporting girder-sections, the said lower and supporting girder-sections thus forming a solid and substantial base, so that the constant passing of loaded cars will not cause deflection of the upper section of the rail at the joints, which deflection occurs in all the present forms of rail-construction, resulting in pounding and hammering of the joint and flattening of the rails and consequent injury to the car and equipment.

A still further object of my present invention is to provide an electric rail construction which will do away with and make unnecessary the "bonding" of, or the electrically connecting of, the joints or abutting end-portions of the rail-sections; which "bonding" now has to be done to obtain a continuous metallic conductor for the purpose of forming the negative or return conductor to complete the electric circuit.

Another principal object of my present invention is to provide a form of construction which will prolong the life of railway tracks, inasmuch as in my invention only the upper rail-section becomes worn out and has to be removed in making necessary repairs, since the lower girder or sub-rail section is practically indestructible; and, furthermore, by reason of the mill being able to roll a much wider base to the lower rail-section, which cannot be done with the present form of girder-rails, I am thereby enabled to dispense with the usual destructible wooden cross-ties and substitute therefor metal ties and struts; as the base of the rail, when set upon

a sub-foundation of concrete, can be supported by the metal ties and struts which will give sufficient downward resistance to carry any load required.

By means of the present invention, I am also enabled to do away with the usual tie-rods used in the present form of construction to hold the rails equidistant such tie-rods being now placed at frequent intervals, between the head and base of the rails, interfere with the laying of the paving blocks causing an uneven spacing of the blocks where such rods cross between the same. By my invention, the rails are held equi-distant by means of peculiarly formed iron ties and struts which are attached to the base of the combination rail underneath the same, the ties preventing the rails from spreading and the struts, preventing the rails from coming together and the combination of tie and strut when in place, preserving the perpendicular position of the rail, the whole being embedded in concrete and forming the permanent and practically indestructible part of my form of construction, so that when it becomes necessary to remove the upper rail-section for renewal, two rows of paving blocks, one row on each side of the rail, need only to be taken up, and it will not be necessary to disturb the remaining portion of the pavement between the rails.

Other objects of this invention not at this time more particularly mentioned will be clearly understood from the following detailed description of the same.

With the various objects of my present invention in view, the said invention consists in the novel rail hereinafter set forth; and, furthermore, this invention consists in the various arrangements and combinations of devices and parts, as well as in the details of the construction of the same, all of which will be hereinafter more particularly described, and then finally embodied in the clauses of the claims which are appended to and which form an essential part of this specification.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a plan view of a portion of a railway track, provided with railway rails embodying the principles of this invention; and Fig. 2 is a collective sectional representation in a plane, through 2—2 in said Fig. 1, with certain portions of the rail construction being represented as broken away, and the several parts shown in said Fig. 2 being illustrated on an enlarged scale. Fig. 3 is a transverse sectional representation of the two girders or rails, said section being made on an enlarged scale, said view showing also a transverse section of the concrete bed, and the pavement between and adjacent to the outer portions of the rails. Fig. 4 is a vertical cross-section through one of the rails and clamping devices or plates for securing the upper rail-section to the lower girder-section by means of bolts and nuts, said view being made on an enlarged scale. Fig. 5 is a detail sectional representation of the lower girder-section and a tie-bar, portions of the said devices being represented in perspective; and Fig. 6 is a similar representation of the two lower girder-sections and a strut between the same. Fig. 7 is a collective perspective view of the upper and lower sections, and portions of the clamping plates, the parts being shown in their relative positions, about to be assembled.

Similar characters of reference are employed in all of the said above described views to indicate corresponding parts.

Referring now to the said figures of the drawings, the reference-character 1 in Fig. 1 of the drawings, indicates the complete rail which embodies the principles of my present invention, the metallic tie being indicated by the numeral 2, and the strut by the numeral 3.

Referring now more particularly to Figs. 4 and 7 of the drawings, it will be seen, that each rail 1 comprises an upper or top rail-section 4, the same forming the rail-head, and a lower or girder-section 5, the latter forming a base or support for the upper or top rail-section 4. The said upper or top rail-section is provided with the longitudinal and oppositely extending tapering flanges 6 and 7, with any form of longitudinally extending head or tread-portion 8, for the reception and running thereon in the usual manner, of a car wheel. The said lower girder or base section 5, is provided along its upper edge with longitudinal and oppositely extending supporting tapering flanges 9 and 10, and along its lower edge the said lower girder or base section 5 is provided with longitudinal and oppositely extending flanges 11 and 12. It will be noticed from an inspection of said Fig. 4, that the combined widths of the supporting flanges 9 and 10, is the same, or approximately so, as the combined widths of the flanges 6 and 7 of the upper rail-section 4, the said flanges 9 and 10 of the lower girder-section 5 providing a longitudinal support or base for the upper rail-section 4, as will be clearly understood. The combined width of the lower flanges 11 and 12 of the lower girder-section 5 is preferably greater than the combined widths of the said flanges 9 and 10, whereby a positive and substantial support for the complete rail upon the sub-foundation 13 of concrete will be the result, as will be clearly understood from an inspection of Figs. 3 and 4 of the drawings.

The two lower and parallel girder-sections 5, when placed upon the concrete foundation are to be connected by means of the previously mentioned metallic ties 14 which extend beneath the flange-portion or members 11 and 12 of the said girder-sections 5 and

each tie being formed with a hook-shaped end or grasping-member 14 adapted to be slipped over and to engage with the outer flange 12, of each girder-section 5, as clearly shown in Figs. 1, 2 and 5 of the drawings. In addition to these metallic ties 2, struts 3, are to be used, as indicated in said Figs. 1, 2 and 6 of the drawings, these struts having their end-portions 15 arranged beneath the said flange-portions or members 11 and 12 and being provided with the upwardly extending hook-shaped members 16 which engage with and extend over the inner flanges 11 of the said rail-section 5. It will thus be seen, that by this arrangement of the metallic ties and struts, the proper gaging of the longitudinally extending combined rail-sections will be the result; and, furthermore, any possible warping or lateral displacement of the combined rail will be impossible. The metallic ties 2 and the struts 3 are usually disposed in the manner shown in said Fig. 1 of the drawings, but it will be evident, that these ties and struts may be disposed in any other desired manner, and any suitable number of ties or struts may be placed in position upon the concrete foundation for connecting the oppositely placed parallel combined rail-sections, to take the place of the destructible wooden ties now used. One of the said ties 2 is used, preferably, at the joints formed by the abutting ends of the lower girder-sections 5, the said tie being of sufficient width, that it will overlap the joint, and its hook-shaped end 14 will prevent any possible spreading at this point.

Returning now to the upper rail-sections 4 these upper rail-sections 4 are placed or disposed upon the lower supporting girder-sections 5, in such a manner that the joints 1 of the abutting end-portions of the rail-sections 4 will be staggered with relation to the joints formed by the abutting end-portions of the said lower girder-sections 5. The said upper or top sections 4 are secured at their joints to the said lower girder-sections 5 by means of suitably formed clamps or plates 17 and 18. Each clamp or plate 17 and 18 is made with an upper web 19 and a lower web 20, a tapering channel-shaped and longitudinally extending member 21 being arranged between and connecting the said webs 19 and 20, substantially as illustrated in Figs. 3, 4 and 7 of the drawings. The said clamping or holding plates 17 and 18 are placed upon opposite sides of the webs of the respective sections 4 and 5, as shown in said Fig. 4 of the drawings, the tapering channel-shaped and longitudinally extending members 21 registering with and embracing the respective tapering flanges 6 and 9, and 7 and 10 of the respective sections 4 and 5, and the upper and lower, and preferably enlarged or bead like marginal edges 22 and 23 of the upper webs 19 and the lower webs 20, respectively, in positive engagement with the under projecting portions of the head or tread-portion 8 and with the upper surface of the flanges 11 and 12, all the said parts being suitably and positively connected by means of suitable bolts 24 and nuts 25, which extend through the registering holes in the webs of the plates and the said upper and lower sections, as will be clearly seen from an inspection of Fig. 4 of the drawings.

I claim:

1. A railway-rail comprising an upper rail and a lower girder section, oppositely extending tapering flanges and a head on said upper rail-section, oppositely extending upper tapering flanges on said lower girder section which form a support for the flanges of said upper rail-section, and oppositely extending lower flanges on said lower girder-section, said lower flanges forming a support for the entire rail; and means for securing said upper rail-section upon said lower girder-section, consisting of perforated plates arranged against the opposite faces of the said upper rail and lower girder-sections, and a tapering channel-shaped and longitudinally extending member on each plate, said tapering channeled and longitudinally extending member embracing the tapering flanges of said upper rail-section and the upper tapering flanges of said lower girder-section, substantially as and for the purposes set forth.

2. The combination, with a pair of railway rails, each rail comprising a lower girder and an upper rail-section, said lower girder-section forming a base and said upper rail-section a head, means for securing said lower girder and upper rail-sections together, each lower girder-section having an upper tapering flanged-portion, said means consisting of perforated plates arranged against the opposite sides of said lower girder and upper rail-sections, said girder and rail-sections and plates being provided with registering bolt-holes, bolts and nuts for securing said plates to said girder and rail-sections, and a metallic tie, said tie comprising a flat body and hook-shaped end-portions extending around and over the lower flanged-portions of said lower girder-sections, substantially as and for the purposes set forth.

3. The combination, with a pair of railway rails, each rail comprising an upper rail and a lower girder-section, oppositely extending tapering flanges and a rail head on said upper rail-section, oppositely extending upper tapering flanges on said lower girder-section which form a support for the flanges of said upper rail-section, oppositely extending outer and inner lower flanges on said lower girder-section, said lower flanges forming a support for the entire rail, means for securing said upper rail-section upon said lower girder-section, consisting of perforated plates arranged

against the opposite faces of the said upper rail and lower girder-sections, a tapering channel-shaped and longitudinally extending member on each plate, said tapering channeled and longitudinally extending member embracing the tapering flanges of said upper rail-sections and the upper tapering flanges of said lower girder-sections, and a metallic tie, said tie comprising a flat body and hook-shaped end-portions extending around and over the said outer lower flanges of said lower girder-section, substantially as and for the purposes set forth.

4. The combination, with a pair of railway rails, each rail comprising a lower girder and upper rail-sections, said lower girder-section forming a base and said upper rail-section a head, means for securing said lower girder and upper rail-sections together, each section having an outer and inner tapering flanged portion, said means consisting of perforated plates arranged against the opposite faces of the said lower girder and upper rail-sections, said sections and plates being provided with registering bolt-holes and nuts for securing said plates to said sections, and a metallic strut comprising a flat body and upwardly extending hook-shaped members embracing the inner flanged portions of said lower girder-sections, substantially as and for the purposes set forth.

5. The combination, with a pair of railway rails, each rail comprising a lower girder and an upper rail-section, oppositely extending tapering flanges and a rail head on said upper rail-section, oppositely extending upper tapering flanges on said lower girder-sections which form a support for the flanges of said upper rail-sections, oppositely extending outer and inner lower flanges on said lower girder-sections, said lower flanges forming a support for the entire rail, means for securing said upper rail-section upon said lower girder-sections, consisting of perforated plates arranged against the opposite faces of the said upper and lower sections, a tapering channeled-shaped and longitudinally extending member on each plate, said tapering channeled and longitudinally extending member embracing the tapering flanges of said upper rail-sections, and the upper tapering flanges of said lower girder-sections, and a metallic strut, comprising a flat body and upwardly extending hook-shaped members embracing the inner lower flanges of said lower girder-sections, substantially as and for the purposes set forth.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 29th day of May, 1906.

JOHN N. AKARMAN.

Witnesses.

FREDK. C. FRAENTZEL,
FREDERICK JAMISON.