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C. R. BOURLAND

2,209,725

TRANSITION RAIL

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FIG. 1.

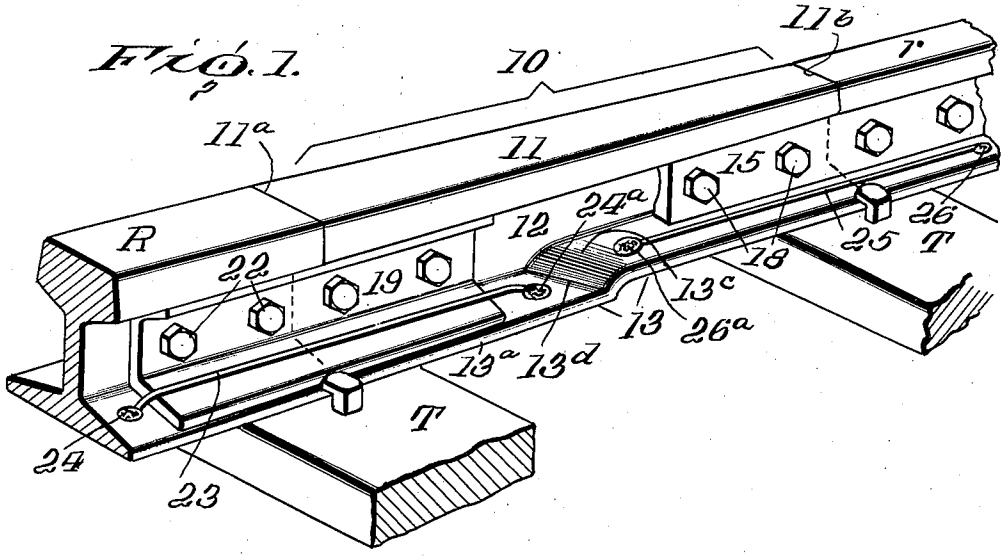


FIG. 2.

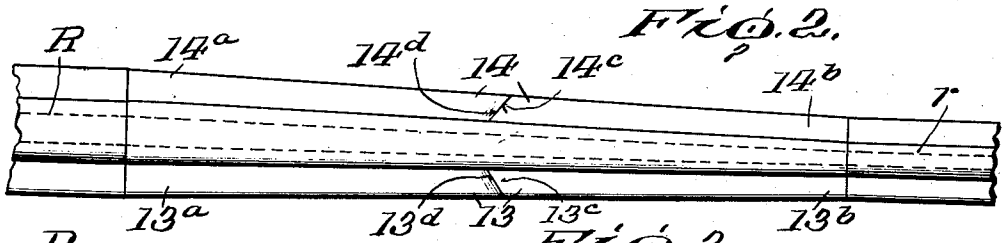


FIG. 3.

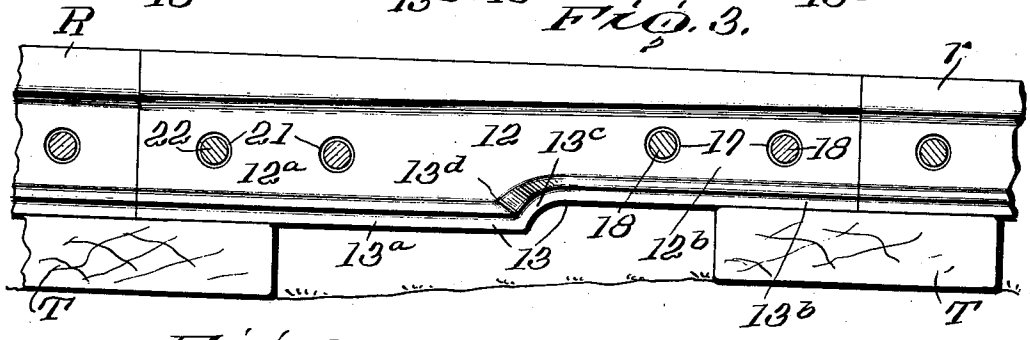


FIG. 4.

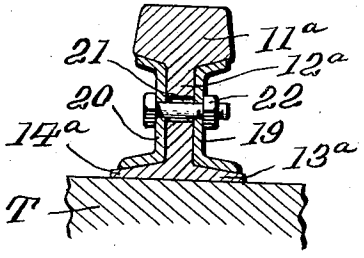
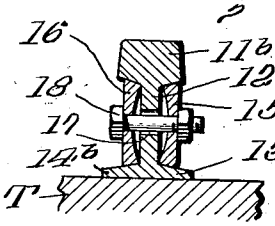


FIG. 5.



Inventor

Charles R. Bourland

By

Mason & Porter Attorneys

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UNITED STATES PATENT OFFICE

2,209,725

TRANSITION RAIL

Charles R. Bourland, Kopperston, W. Va., assignor to Portable Lamp & Equipment Company, Pittsburgh, Pa., a corporation of Pennsylvania

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6 Claims. (Cl. 238—167)

The present invention is concerned with the joining of rails of different dimensions and weights in laying railway tracks, and the invention more particularly relates to new and useful improvements in a transition rail section for joining track rails of different gauges, dimensions or weights.

An object of the present invention is to provide a transition rail section which is adapted to be interposed between the ends of adjoining rails of different cross sections for effecting a substantially smooth junction between the rails and which is so shaped and constructed that it can be employed as a "right" or "left" section without change therein.

A further object of the invention is to provide a transition rail section of the above type, which is symmetrically spaced about its central vertical plane so that it can be employed as a "right" or "left" section in joining rails of different dimensions.

A still further object of the invention is to provide a transition rail section of the above type wherein the tread or ball of the rail section is shaped so that the larger end thereof substantially coincides with the ball of the larger rail and the smaller end thereof substantially coincides with the ball of the smaller rail.

A still further object of the invention is to provide a transition rail section of the above type, wherein standard fish plates, angle bars and the like can be used for connecting the transition rail section to the track rails, thus eliminating the use of special equipment.

A still further object of the invention is to provide a transition rail section of the above type, wherein the vertical web of the rail section is reduced in height intermediate the ends thereof and wherein the base flanges of this portion of the rail section are shaped and constructed so as to strengthen the entire rail section, thus compensating for the reduction in size of the web.

The above and other objects of the invention will in part be obvious and will be hereinafter more fully pointed out.

In the accompanying drawing,

Figure 1 is a perspective view showing the transition rail section secured in position between two track rails of different dimensions.

Figure 2 is a top plan view of the transition rail positioned between two rails of different dimensions.

Figure 3 is a side view of Figure 2.

Figure 4 is a vertical end section through the transition rail at the larger end.

Figure 5 is a similar vertical end section through the smaller end.

The invention is concerned with the provision of a device for affording a substantially smooth junction between track rails of different dimensions, weights or gauges. For convenience, each device is termed a transition rail. Such a transition rail is particularly adapted for use in laying mine tracks, but it is obvious that the rail can be used in various other instances, as for instance, in joining smaller track rails of a branch line or siding to a main track line. The transition rail may be made in varying sizes, depending on the size of the track rails to be joined. However, the construction of the transition rail is such that it can be used on either track rail without special right and left construction. Thus, the transition rail can be used as a "right" or "left" section without any change in the construction thereof.

Referring more in detail to the accompanying drawing, the transition rail section 10 is shaped so that one end thereof is of substantially the same cross section as that of the larger track rail R and so that the opposite end thereof is of substantially the same cross section as that of the smaller track rail *r*. Thus, the two track rails, R, *r*, which are of different sizes, as for instance, 60 and 40 pounds, respectively, may be joined by the interposed transition rail section 10 in the manner illustrated.

The transition rail is symmetrically shaped on both sides of a vertical plane passing centrally and longitudinally therethrough. The tread surface of the ball 11 of the transition rail is straight and horizontal from end to end while the sides are gradually tapered from the larger end 11*a* to the smaller end 11*b*. The under faces of the ball of the rail are shaped so that the cross sections of the larger and smaller ends thereof will exactly coincide with the cross sections of the balls of the larger and smaller track rails R, *r*, which are to be joined. The web 12 of the rail 10 is tapered and shaped so that larger end 12*a* will coincide with the web of the larger rail R and so that the smaller end 12*b* will coincide with the web of the smaller rail *r*.

The base flanges 13, 14 of the transition rail 10 are shaped so that they will coincide with the flanges on the track rails to be joined. Since the web of the smaller track rail *r* is of lesser height than that of the web on the larger rail R, the end 12*b* of the web 12 on the transition rail is of a height less than that of the end 12*a* so that the track rails will fit against the ends of the transition rail. Thus, the base flanges 13, 14 are provided with flange portions 13*a*, 13*b* and 14*a*, 14*b*, respectively, which are offset vertically with respect to one another. The flange portions 13*a*, 14*a* extend along the bottom of the web portion 12*a* and the flange portions 13*b*, 14*b* extend along the bottom of the web portion 12*b*. At the junction between the flange portions 13*a*, 13*b* and 14*a*, 14*b*, the portions 13*b*, 14*b* are arched, as at 13*c*, 14*c*, downwardly and

join or merge into the portions 13a, 14a, respectively, along inclined lines 13d, 14d, which are illustrated as diverging from the web 12 outwardly in the direction of the small end of the transition rail. The angle of curvature of each of the arched portions 13c, 14c is greater at the outside edges of the base flanges so that this ordinarily weak portion of the transition rail is greatly strengthened. This portion of the rail is not generally supported by a cross-tie so that the arching of this offset portion along angular lines serves to distribute the stresses, thus strengthening the rail section at this vital point so as to guard against breakage or deformation.

In laying the track rails, the grade ballast is built up under the smaller rail r, as shown particularly in Figure 3. Wooden ties T are preferably placed at such joints that each end of the transition rail and the adjacent ends of the track rails will rest thereon. The track rails R, r are placed so that the center axes thereof are in substantial alignment, thus permitting the symmetrically tapered transition rail to be placed on the ties between the ends of the track rails with the smaller end of the transition rail coinciding with and abutting the end of the rail r, and with the larger end of the transition rail coinciding with and abutting the end of the rail R.

It is true that the gauge of the track is thrown out slightly but the construction and shaping of the transition rail is such that the gauge will only be thrown out about ⅛ inch between 60 and 40 pound rails. Even between 60 and 20 pound rails, the gauge will only be thrown out about ⅜ inch. In tracks of this type, this slight variation is unimportant and, in fact, the originally laid track will probably vary to this extent. Furthermore, the width of the vehicle wheels is sufficient so that no derailing will occur. In fact, the tread on mine car wheels is in the neighborhood of 4 inches.

In securing the transition rail to the ends of the rails R, r which are to be joined, standard equipment can be used. Thus, the smaller end of the transition rail can be secured to the smaller track rail r by standard fish plates 15, 16. The web portion 12b of the transition rail is provided with openings 17 which are disposed in alignment with similar openings in the fish plates so that these fish plates can be secured together by bolts 18 or the like. The smaller rail r is similarly secured to the fish plates. The larger web portions 12a of the transition rail is secured to the larger rail R by standard angular bars 19, 20. The web portion 12a is provided with openings 21 which are disposed in alignment with similar openings in the angular bars 19, 20. Bolts 22 or the like are passed through these openings for securing the angular bars to the web portion 12. The larger rail R is similarly secured to the web portions of the angular bars 19, 20.

In the use of electrically operated rolling stock, it is, of course, necessary to provide an electric bond between each break in the rails. Thus, as shown in Figure 1, the larger rail R is electrically connected to the larger end of the transition rail section by means of a wire 23 having metal lugs 24, 24a at the ends thereof. The lug 24 is welded to the flange of the rail R and the lug 24a is welded to the flange portion 13a of the transition rail section. A similar bonding is effected between the smaller rail r and the smaller end of the transition rail section. Thus, a wire 25 is provided with metal lugs 26, 26a at the ends thereof. The lug 26 is welded or otherwise secured to the flange of the rail r and the lug 26 is suitably secured, as by welding, to the flange portion 13c of the transition rail section.

From the foregoing description, it will be appreciated that the present invention provides an improved transition rail section which can be conveniently utilized for joining the ends of track rails of different dimensions, weights, or gauges. The transition rail section is one which is symmetrically shaped so that it may be used as a "right" or a "left" section, thus obviating the necessity of providing special right and left constructions. The cross-section of the larger end of the transition rail coincides with the cross-section of the larger track rail and likewise, the cross-section of the smaller end of the transition rail coincides with the cross-section of the smaller track rail. This construction is afforded by the symmetrical shaping of the transition rail in such a manner that the transition rail may be used on either the right or the left track rail. The shaping of the ends of the transition rail are substantially identical with the ends of the track rails to be joined. Thus, the ball of the rail is tapered from the larger end toward the smaller end and the web is likewise tapered. The height of the web is reduced intermediate the ends thereof so that the web portions at the ends of the transition rail will identically fit the corresponding webs of the track rails to be joined. Similarly, the base flanges are shaped so as to coincide with the base flanges on the track rails. Thus, standard fish plates or angle bars may be employed for securing the transition rail to the track rails to be joined. It is to be further noted that the region at which the web is reduced in height is materially strengthened by the construction of the base flanges in this region. Thus, this ordinarily weak portion of the transition rail is greatly strengthened by the construction of the base flanges thereof.

While one form of the invention has been shown for purposes of illustration, it is to be clearly understood that minor changes in the details of construction and arrangement of parts may be made without departing from the scope of the invention as set forth in the appended claims.

I claim:

1. A transition rail for joining the ends of track rails of different dimensions where the vehicle wheel tread is of a width sufficient to negotiate a slightly varying track gauge, comprising a rail section having the cross section of the larger end thereof substantially identical with the cross section of the larger track rail and having the cross section of the smaller end thereof substantially identical with the cross section of the smaller track rail and adapted to be placed between the ends of the track rails with the larger end thereof disposed adjacent the end of the larger track rail and with the smaller end thereof disposed adjacent the end of the smaller track rail, and said rail section being shaped symmetrically about a vertical plane passing centrally and longitudinally therethrough and laterally tapering gradually from the larger end to the smaller end to permit identical rail sections to be used on both track rails whereby to effect a gradual and relatively small change in the track gauge throughout the rail sections on both track rails without any abrupt transition point.

2. A transition rail for joining the ends of

track rails of different dimensions where the vehicle wheel tread is of a width sufficient to negotiate a slightly varying track gauge, comprising a rail section including a web and base flanges having the cross section of the larger end thereof substantially identical with the cross section of the larger track rail and having the cross section of the smaller end thereof substantially identical with the cross section of the smaller track rail and adapted to be placed between the ends of the track rails with the larger end thereof disposed adjacent the end of the larger track rail and with the smaller end thereof disposed adjacent the end of the smaller track rail, said rail section being shaped symmetrically about a vertical plane passing centrally and longitudinally therethrough and laterally tapering gradually from one end to the other to permit identical rail sections to be used on both track rails whereby to effect a gradual and relatively small change in the track gauge throughout the rail sections on both track rails without any abrupt transition point, the web of the said rail section at the bottom thereof being relatively abruptly reduced in height intermediate the ends thereof to provide a region of vertical transition from the smaller to the larger ends of the said web and the base flanges of said rail section being arched in the region of transition and merging into one another along lines inclined with respect to the longitudinal axis of the rail section.

3. A transition rail for joining the ends of track rails of different dimensions where the vehicle wheel tread is of a width sufficient to negotiate a slightly varying track gauge, comprising a rail section including a ball portion, a web, and base flanges; said rail section having the cross section of the larger end thereof substantially identical with the cross section of the larger track rail and having the cross section of the smaller end thereof substantially identical with the cross section of the smaller track rail and adapted to be placed between the ends of the track rails with the larger end thereof disposed adjacent the end of the larger track rail and with the smaller end thereof disposed adjacent the end of the smaller track rail, said rail section being shaped symmetrically about a vertical plane passing centrally and longitudinally therethrough and having the ball portion, the web and base flanges tapering laterally from the larger end thereof to the smaller end to permit identical rail sections to be used on both track rails whereby to effect a gradual and relatively small change in the track gauge throughout the rail sections on both track rails without any abrupt transition point, and the web of said rail section being relatively abruptly reduced in height intermediate the ends and at the bottom thereof for providing a region of vertical transition from the larger to the smaller ends of the said web and said base flanges being shaped in the region of transition for strengthening the rail section at this point.

4. A transition rail for joining the ends of track rails of different dimensions where the vehicle wheel tread is of a width sufficient to negotiate a slightly varying track gauge, comprising a rail section having the cross section of the larger end thereof substantially identical with the cross section of the larger track rail and having the cross section of the smaller end thereof substantially identical with the cross section of the smaller track rail and adapted to be placed between the ends of the track rails with the larger end thereof disposed adjacent the end of the larger track rail and with the smaller end thereof disposed adjacent the end of the smaller track rail, said rail section being shaped symmetrically about a vertical plane passing centrally and longitudinally therethrough and laterally tapering gradually from one end to the other to permit identical rail sections to be used on both track rails whereby to effect a gradual and relatively small change in the track gauge throughout the rail sections on both track rails without any abrupt transition point, said rail section including a web which is offset at the bottom and intermediate the ends thereof and base flanges similarly offset and providing an intermediate region of vertical transition whereby to permit the use of standard fish plates and angle bars for securing the rail sections at the ends of the track rails to be joined.

5. A transition rail for joining the ends of track rails of different dimensions where the vehicle wheel tread is of a width sufficient to negotiate a track gauge which may vary slightly without impairing safety requirements, comprising a rail section adapted to be assembled between the ends of the track rails and having the cross section of the larger end of the tread portion disposed adjacent and substantially identical with the cross section of the tread portion of the larger track rail and having the cross section of the smaller end of the tread portion disposed adjacent and substantially identical with the cross section of the tread portion of the smaller track rail, and said rail section being shaped symmetrically about a vertical plane passing centrally and longitudinally therethrough and laterally tapering gradually from the larger end to the smaller end thereof to permit identical rail sections to be used on both track rails whereby any change in the track gauge throughout the rail sections on both track rails is gradual and relatively small without any abrupt transition point.

6. A transition rail for joining the ends of track rails of different dimensions where the vehicle wheel tread is of a width sufficient to negotiate a track gauge which may vary slightly without impairing safety requirements, comprising means providing a rail section having a tread portion adapted to be assembled between the ends of the track rails; said tread portion, when assembled between the ends of the track rails, having the cross section of the larger end thereof disposed adjacent and substantially identical with the cross section of the tread portion of the larger track rail and having the cross section of the smaller end thereof disposed adjacent and substantially identical with the cross section of the tread portion of the smaller track rail; and said rail section being secured to the webs of the track rails when in assembled position between the ends of the track rails, and having at least the tread portion thereof shaped symmetrically about a vertical plane passing centrally and longitudinally therethrough and laterally tapering gradually from the larger end to the smaller end thereof to permit identical rail sections to be used on both track rails whereby any change in the track gauge throughout the rail sections on both track rails is gradual and relatively small without any abrupt transition point.

CHARLES R. BOURLAND.