

SPECIFICATION

Track assembly for toy trains

- 5 This invention relates to tracks for toy trains and, more particularly, to a track assembly made by injection moulding of a thermoplastic material and comprising rails detachably mounted at their ends on ties, that is to say members which in full scale railway track would be referred to as sleepers. In a previous form of track assembly, the rails are detachably mounted on the ties by the inter-locking of a pair of studs on the top face of each tie with studs in longitudinal cavities in the rails and with the side and end walls adjacent the cavities at the ends of the rails.

- 10 The main object of the invention is to provide an improved coupling between the rails and the ties to enable the assembly and dis-assembly of the components to be made easy and convenient for children playing with a building set comprising such rail and tie elements.

- According to the invention, a track assembly for toy trains comprises a pair of rails each in the form of a substantially rod-shaped element having an upper face and a bottom face, a longitudinally extending rail-forming rib integral with the upper face and a longitudinally extending cavity in the bottom face and a pair of ties each in the form of a rectangular plate element having a bottom face and a top face provided with upwardly extending coupling studs, with coupling means for detachably mounting the ends of the rails on the ties, and defined by a combination of a first aperture in the bottom (when in the inverted position) of the cavity adjacent each end of each rail and a second aperture extending transversely through the respective rib and communicating with the first aperture and, on each tie, a pair of upwardly extending spring clips spaced apart at a distance corresponding to the rail gauge of the track, each clip comprising a foot having a width substantially equal to the width of the cavity in each rail and having a pair of upwardly extending and resiliently deformable tongues forming a resilient fit in the first aperture and extending into the second aperture when the foot is pressed into the cavity, for detachably inter-locking each tie with a rail. To couple a rail to a tie it is therefore merely necessary to press a spring clip on a tie into the corresponding aperture in a rail.

- Preferably the upper ends of the resiliently deformable tongues of each spring clip on a tie are provided with outwardly extending projections for engagement with the upper face of a rail, adjacent opposite edges of the first aperture, when the foot of a spring clip is pressed into the cavity of the rail for detachably inter-locking the tie with the rail. Consequently when the spring clip is pressed into the aperture the outwardly extending projections will cause the tongues to be pressed together as they pass through the first aperture, but when they reach the second aperture the tongues will spring apart and lock the two components together with a snap action.

- 65 An example of a construction in accordance with

the invention will now be explained in more detail with reference to the accompanying drawings, wherein:-

- Figure 1 shows a plan view of a track assembly; Figures 2, 3 and 4 show a rail viewed from above, from below and from one side respectively; Figures 5 and 6 show a tie according to the invention viewed from above and from below, respectively; Figure 7 is a sectional view along the line VII-VII in Figure 6; Figure 8 is an enlarged sectional view of a rail along the line VIII-VIII in Figure 3 in a position above one side of a part of a corresponding tie; Figure 9 shows an enlarged section of the interconnected rails and ties of Figure 8 along the line IX-IX in Figure 1; Figure 10 is a side view of the tie shown in Figures 5, 6 and 7; Figure 11 is an end view of the tie mounted in an inclined position relatively to a horizontal top face of a supporting structure; Figure 12 is a side view of the tie and supporting structure of Figure 11; Figure 13 shows a part of a track assembly provided with a gradient; and Figure 14 is a perspective end view of a pair of rails mounted on a tie, wherein one of the rails is shown partly in section.
- 95 The track assembly shown in Figure 1 comprises a pair of rails generally designated as 10 and a pair of ties generally designated as 20. The rails are detachably mounted on the ties by coupling means constituting the novel feature of the invention which, however, are not visible in Figure 1. They will be described in the following description with reference to Figures 2 to 14, in particular from the description of Figure 9, which is a section along the line IX-IX in Figure 1.
- 105 In Figures 2, 3 and 4 there is shown one end of a rail element according to the invention comprising an elongated, substantially rod-shaped body 10 having an upper face 10a and a bottom face 10b. A rail forming rib 11 integral with the upper face 10a extends longitudinally of the rail and the bottom face 10b is provided with side walls 15 and end walls 16 defining a longitudinal cavity 12. In the bottom face ("bottom face" being related to the inverted position, i.e. the top face in the normal position) of this cavity adjacent the end wall 16 there is provided a first aperture 13, hereinafter referred to as the bottom aperture, and above this aperture the rib 11 is provided with a second aperture, hereinafter referred to as the rib aperture 14, which extends transversely through the rib and communicates with the bottom aperture 13, as shown more specifically in Figure 8. The bottom aperture 13 is preferably of rectangular shape, whereas the rib aperture 14 is a relatively narrow slit. The reasons for this configuration will be explained in the following with reference to the coupling of the tie elements.
- 125 The tie elements shown in Figures 5 to 12 are made of rectangular plates 20 having a top face 20a and a bottom face 20b which is constituted by the lower end faces of the end walls 26 and side walls

27. These walls define a cavity 20c which includes a row of tubular coupling studs 28 for clamping between two pairs of cylindrical coupling studs arranged in the same configuration as studs 21a on the top face 20a of the plate element 20. The side walls 27 are provided with longitudinal recesses 29, the function of which will be explained with reference to Figures 10 to 13.

The top face 20a of the ties 20 is provided with two rows of the cylindrical coupling studs 21a referred to above and two pairs of upwardly extending spring clips 21 spaced apart at a distance corresponding to the rail gauge of the track. Each of these spring clips consists of a foot 22 (Figures 8 and 9) integral with a pair of upwardly extending and resiliently deformable tongues 23 separated by a narrow slit 25 and provided with outwardly extending projections 24 at the upper ends of the tongues.

The coupling means for detachably interconnecting the ends of the rails with the ties co-operate in the manner most clearly shown in Figures 8 and 9. Referring to Figure 8, adjacent the end wall 16 of the rail element 10, 11, the three cavities described with reference to Figure 3, i.e. the lengthwise extending cavity 12 in the bottom of the rail, the bottom aperture 13 and the rib aperture or slit 14 extending transversely through the rib 11 inter-communicate as shown.

The width of the foot 22 of each spring clip 21 is substantially equal to the width of the cavity 12 and the distance x between the lower face 24a of the projections 24 and the upper face 22a of the foot 22 is equal to or slightly greater than the thickness of the wall of the rail defining the sides of the bottom aperture 13.

When connecting the rail element 10 with the tie element 20 by pressing the two elements together into the position shown in Figure 9, the foot 22 will be firmly clamped in the cavity 12 between the end wall 16 and the side walls 15. At the same time, the projections 24, when passing through the bottom aperture 13, will cause the resiliently deformable tongues 23 to be pressed together until the projections 24 have passed right through the bottom aperture 13 and reached the upper surface 10a of the rail. In this final position, the tongues 23 will again expand and cause the lower face 24a of the projections 24 to be firmly clamped against the top face 10a of the rail.

This provides a greatly enhanced coupling effect due to the co-action of the foot 22 with the walls of the cavity 12, the lower faces 24a of the projections 24 with the top face 10a and - at least to a certain extent - the pressure of the sides of the tongues 23 against the walls of the bottom aperture 13.

In the embodiment shown in Figures 5 to 7 and 10 to 13, the tie element 20 is designed to build a track having a gradient as shown in Figure 10.

In the prior construction referred to originally, such gradients required the rails to be shaped with inclined end faces. This complication is avoided by positioning the tie elements on supports with an inclination relative to the horizontal top faces of the supports. The feature which permits such an arrangement is the provision of the recess 29 in the

bottom face 20b of each of the side walls 27, as shown in Figures 6, 10 and 12.

As shown in these Figures, a tie element 20 is disposed in an inclined position relative to the horizontal top face 31 of a supporting structure 30, which may be a building block or a combination of building blocks in a toy building set. The top face 31 of this structure is provided with coupling studs 31a, which are identical with the studs 21a of the ties 20 and are adapted to engage the tubular studs 28 in the cavity 20c of each tie. As shown in Figure 12, the length of the recesses 29 is substantially equal to or slightly larger than the length of the supporting structure 30, which enables the tie 20 to be tilted relative to the horizontal top face 31 of the structure 30 to a position wherein one edge of this face coincides with the bottom face 29a of the recess 29. In this inclined position of the tie 20 on the supporting structure 30, the coupling studs 31a will remain in engagement with the studs 28 although slightly displaced relatively thereto.

CLAIMS

1. A track assembly for toy trains comprising a pair of rails each in the form of a substantially rod-shaped element having an upper face and a bottom face, a longitudinally extending rail-forming rib integral with the upper face and a longitudinally extending cavity in the bottom face and a pair of ties each in the form of a rectangular plate element having a bottom face and a top face provided with upwardly extending coupling studs, with coupling means for detachably mounting the ends of the rails or the ties and defined by a combination of a first aperture in the bottom (when in the inverted position) of the cavity adjacent each end of each rail and a second aperture extending transversely through the respective rib and communicating with the first aperture and, on each tie, a pair of upwardly extending spring clips spaced apart at a distance corresponding to the rail gauge of the track, each clip comprising a foot having a width substantially equal to the width of the cavity in each rail and having a pair of upwardly extending and resiliently deformable tongues forming a resilient fit in the first aperture and extending into the second aperture when the foot is pressed into the cavity, for detachably interlocking each tie with a rail.

2. A tie for use in a track assembly as claimed in claim 1.

3. A tie as claimed in claim 2, in which the upper ends of the resiliently deformable tongues are provided with outwardly extending projections for engagement with the upper face of a rail adjacent opposite edges of the first aperture, when the foot of a spring clip is pressed into the cavity of a rail for detachably inter-locking the tie with the rail.

4. A tie as claimed in claim 2 or claim 3 of which the bottom face is provided with side and end walls defining a cavity containing coupling studs for detachably mounting the tie on complementary studs on the top face of a supporting structure and at least one of the side walls is provided with a longitudinally extending recess adjacent its bottom edge for enabling the tie to be mounted in an inclined position relative to a horizontal top face of a



27. These walls define a cavity 20c which includes a row of tubular coupling studs 28 for clamping between two pairs of cylindrical coupling studs arranged in the same configuration as studs 21a on the top face 20a of the plate element 20. The side walls 27 are provided with longitudinal recesses 29, the function of which will be explained with reference to Figures 10 to 13.

The top face 20a of the ties 20 is provided with two rows of the cylindrical coupling studs 21a referred to above and two pairs of upwardly extending spring clips 21 spaced apart at a distance corresponding to the rail gauge of the track. Each of these spring clips consists of a foot 22 (Figures 8 and 9) integral with a pair of upwardly extending and resiliently deformable tongues 23 separated by a narrow slit 25 and provided with outwardly extending projections 24 at the upper ends of the tongues.

The coupling means for detachably interconnecting the ends of the rails with the ties co-operate in the manner most clearly shown in Figures 8 and 9. Referring to Figure 8, adjacent the end wall 16 of the rail element 10, 11, the three cavities described with reference to Figure 3, i.e. the lengthwise extending cavity 12 in the bottom of the rail, the bottom aperture 13 and the rib aperture or slit 14 extending transversely through the rib 11 inter-communicate as shown.

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2. A tie for use in a track assembly as claimed in claim 1.

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tie supporting structure having upwardly extending coupling studs engaging the coupling studs in the cavity of the tie.

5. A track assembly as claimed in claim 1 in which each tie is in accordance with claim 3 or claim 4.

6. A track assembly for toy trains substantially as described and as illustrated with reference to the accompanying drawings.

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