

(12) STANDARD PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 2003200136 B2**

- (54) Title
A method of constructing a rail track on a track-receiving concrete slab
- (51) International Patent Classification(s)
E01B 21/02 (2006.01) **E01B 21/04** (2006.01)
E01B 1/00 (2006.01) **E01B 37/00** (2006.01)
E01B 9/62 (2006.01)
- (21) Application No: **2003200136** (22) Date of Filing: **2003.01.16**
- (30) Priority Data
- (31) Number (32) Date (33) Country
02 00 897 **2002.01.24** **FR**
- (43) Publication Date: **2003.08.14**
(43) Publication Journal Date: **2003.08.14**
(44) Accepted Journal Date: **2008.12.18**
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- (56) Related Art
DE19604887
GB 468182

A B S T R A C T

A method of constructing a rail track on a track-receiving concrete slab (1) provided with channels (4) serving to receive the rails (2) of the rail track, said method being characterized in that, after the concrete forming the track-receiving slab (1) has set, it comprises at least the following steps:

a) the stretches of rail (2) are put in place above the channels (4) in the track-receiving slab (1), each rail having a foot (P) coated with a casing (3) of resilient material; and

b) the foot (P) as coated with its casing (3) is inserted into the channel (4) by force.

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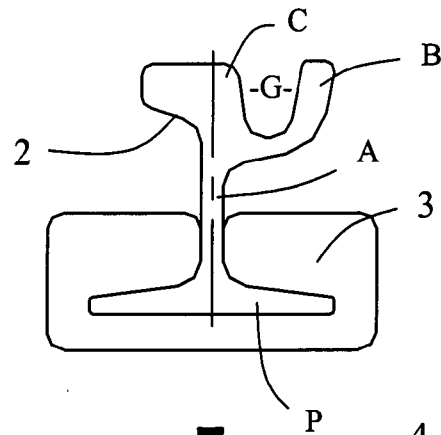


FIG 1

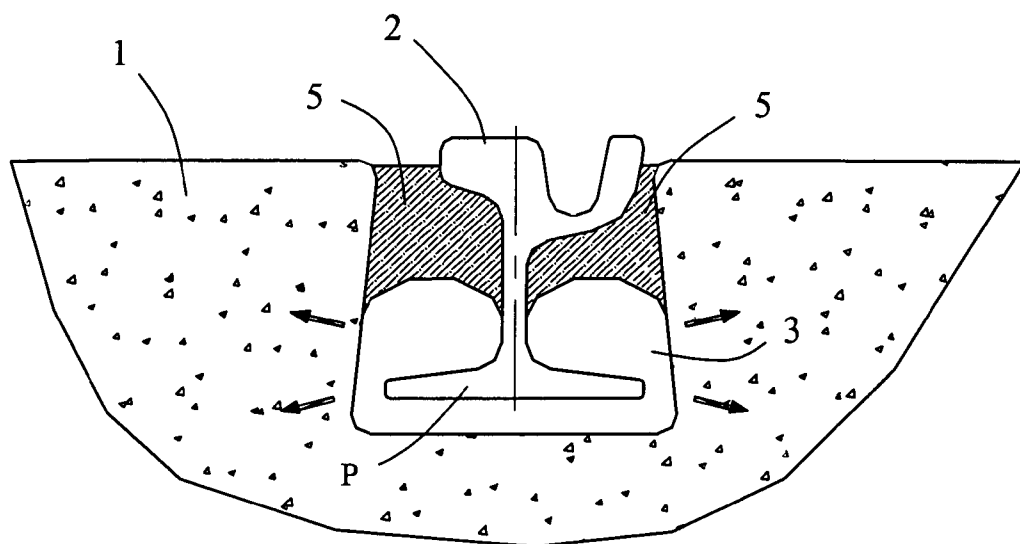
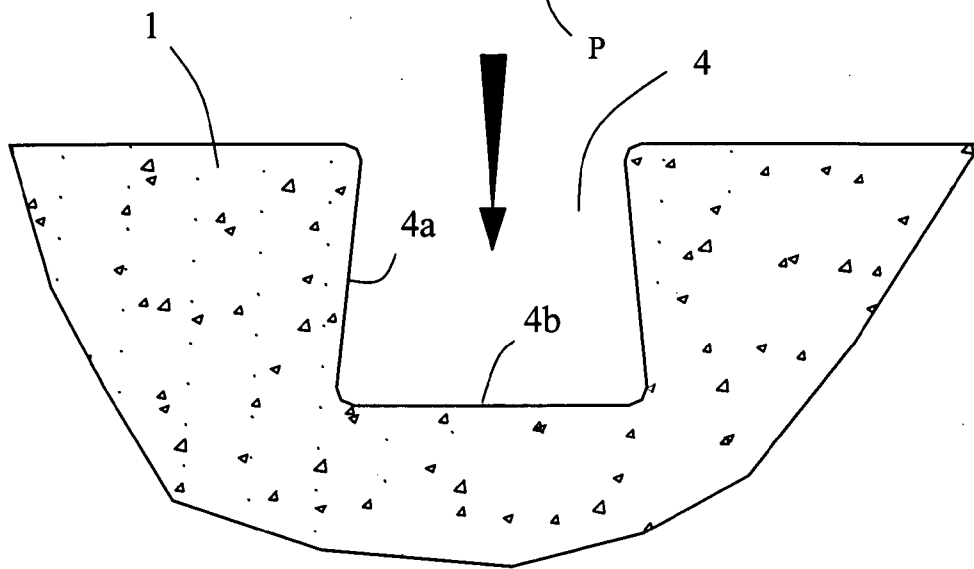


FIG 2

A METHOD OF CONSTRUCTING A RAIL TRACK ON A TRACK-RECEIVING CONCRETE SLAB

5 The invention relates to a method of constructing a rail track on a track-receiving concrete slab. The invention is particularly applicable to constructing rail tracks for a subway or a tramway.

10 A reference herein to a patent document or other matter which is given as prior art is not to be taken as an admission that that document or matter was, in Australia, known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

15 Methods of constructing rail tracks exist that use a track-receiving concrete slab, such methods being increasingly frequently used because they make it possible for the rate of construction of the track-receiving slab to be very fast. In such methods, wet concrete is generally continuously cast by an automatic machine that follows the path of the track to be built, the machine having a sliding mold or "slip form" provided with two grooves for forming the channels in the slab of concrete. After the concrete has set, the rails are laid
20 in segments in the channels, they are welded end-to-end, and they are then chocked manually to the desired height, and spaced apart to the desired gauge, with clearance being left relative to the edges of the channels. A resilient material such as resin is then cast into the channels.

25 That technique is fast for laying the concrete, but it suffers from the drawback of being slow for laying and chocking the rails. It is therefore confined to portions that are quite short, such as level-crossing portions.

30 It would be desirable to remedy that drawback by proposing a method of constructing a rail track on a concrete slab in which the rails can be put in place in the channels much faster.

According to the present invention there is provided a method of constructing a rail track on a track-receiving concrete slab provided with channels serving to receive rails of the rail track, wherein, after concrete forming the track-receiving slab has set, the method comprises at least the following steps:

5

a) stretches of rail are put in place above the channels in the track-receiving slab, each rail having a foot coated with a casing of resilient material whose thickness is such that the foot as coated with the casing is slightly wider than the channel;

10

b) the foot as coated with the casing is inserted into the channel by force, the shape of the channel being suitable for reacting to compression forces from the resilient material of the casing, with a reactive force tending to hold the rail at the bottom of the channel;

15

c) an empty volume situated in a top portion of the channel on either side of the rail is filled with resin which seals the installation.

In particular embodiments, the construction method of the invention may have one or more of the following characteristics, taken in isolation or in any technically feasible combination:

prior to step a), the rails in each stretch are welded together end-to-end; at least locally, each channel has a width that tapers going from the bottom to the top of the channel;

said channels are of trapezium-shaped cross-section, the larger base of the trapezium constituting the bottom of the channel;

the edges of the channel are inclined at an angle in the range 3° to 15° relative to the plane perpendicular to the bottom of the channel;

the casing coating the foot of each of the rails has a shape that has extra thickness of a few millimetres relative to the complementary shape of the channel;

prior to step c), a primer is deposited on the edges of the channel, and on the sides of the rail so as to improve the adhesive keying of the resin; and

the track-receiving slab is obtained by casting a mass of wet concrete continuously along a determined path.

5

Features and advantages of the present invention will be better understood on reading the following description of an embodiment of the invention given by way of non-limiting example, and with reference to the accompanying drawings, in which:

10

Figure 1 is a cross-section view of a track portion, at one of the stretches of rail, diagrammatically showing a construction method in a particular implementation of the invention; and

15

Figure 2 is a cross-section view of the track portion built by implementing the method of Figure 1.

To make the drawing clearer, only those elements necessary to understanding the invention are shown.

20

Figure 1 is a detail view of a track-receiving concrete slab 1 serving to receive one or more stretches of grooved rail 2. For each stretch of rail 2, the slab 1 is provided with a channel 4 delimited by side edges 4a and by a bottom 4b.

25

For example, the track-receiving slab 1 may be made by a construction method known to the person skilled in the art as the "slip-form" method, and it is advantageously cast on a clean subgrade (not shown in the figure). In such a method, the slab 1 is built continuously by means of a machine carrying a form and moving along the path of the rail track, wet concrete being pumped or deposited in front of the machine, the form imparting a predetermined shape to it as the machine advances. The overall shape of the concrete slab 1 is

30

substantially rectangular, the channels 4 serving to receive the stretches of rails 2 being formed by corresponding grooves in the form.

5 As shown in Figure 1, the cross-section of the channels 4 is trapezium-shaped, the side edges 4a being slightly inclined, e.g. by in the range 3° to 15° relative to the plane perpendicular to the bottom 4b, which constitutes the larger base of the trapezium.

10 The stretches of rails 2 are made up of a succession of rails 2 welded end-to-end, each of the rails comprising a foot P at the bottom, a web A provided with surfaces facing in mutually opposite directions in the middle, and, at the top, a head C and a chine B that define a groove G serving to receive the flanges of the wheels of a rail vehicle.

15 In the invention, the foot P of each rail 2 is coated with a casing 3 of resilient material such as a synthetic rubber, e.g. a polyurethane rubber, the casing 3 being of thickness such that the foot P as equipped with its casing 3 has a width slightly larger than the width of the channel 4 at the bottom 4b thereof. Such a casing 3 is advantageously obtained by molding the resilient
20 material around the foot P of the rail 2, it being possible for this molding to be performed on site, or earlier in the factory. Preferably, the casing 3 also covers part of the web A of the rail 2 while stopping beneath the shape of the head C of the rail 2, and has an outline that is substantially rectangular.

25 The construction method of the invention is described below with reference to Figure 1 which shows the step of inserting the rail 2 into the channel 4, this step being performed after the concrete forming the track-receiving slab 1 has set.

30 As shown in Figure 1, the stretch of rail 2 is brought above the channel 4 by means of a gantry (not shown), and the rail 2 is lowered gradually onto the channel 4 until the bottom face of the casing 3 coating the foot P comes flush with the top surface of the track-receiving slab 1.

A force is then applied locally and vertically downwards, e.g. by means of a pressure wheel bearing on the rail 2 in order to insert the foot P of the rail 2 into the channel 4 by force, the edges of the casing 3 then being
5 compressed against the side edges 4a of the channel 4 while generating compressive forces shown by arrows in Figure 2. Because of the trapezium shape of the channel 4, the reaction forces exerted by the side edges 4a on the casing then tend to center the rail 2 in the channel 4, and the resultant of these reaction forces has a downward vertical component that holds the rail 2
10 at the bottom of the groove 4, thereby achieving initial locking of the rail 2 in the channel 4.

As shown in Figure 2, once the insertion operation has been effected, the empty volume disposed on either side of the rail 2 in the top portion of the
15 channel 4 is filled with a resin 5 such as a polyurethane resin, which resin comes to adhere to the rails 2 and to the edges 4a of the channel 4, it being possible advantageously for the adhesive keying of the resin 5 to be reinforced by applying a primer to the concrete edges of the channel 4 and to the sides of the rail 2. The resin 5 setting participates in finally locking the rail 2 in its
20 channel 4, and the resin also contributes to preventing water from penetrating into the installation, thereby protecting it from frost. Such a resin 5 also provides reinforced electrical insulation and protects the underlying casing 3.

Such a method of construction offers the advantage of making it
25 possible to accelerate the rate at which the rails are laid in the channels, and thus of reducing the time required to construct the rail tracks. In addition, accurate positioning of the rails within the channels is achieved automatically by co-operation between the compression forces from the resin and the shape of the channel, thereby making it possible to omit any rail adjustment
30 operation.

Naturally, the invention is in no way limited to the embodiment described and shown, which is given merely by way of example. Modifications

remain possible, in particular concerning the make up of the various elements, or the use of equivalent substitute techniques, without going beyond the scope of protection of the invention.

5 Thus, the above-described figures show a method of constructing a rail track provided with grooved rails, but the method of the invention is also applicable to constructing rail tracks provided with rails of the standard flat-bottomed rail type having a head that is substantially cylindrical, by allowing the head of the rail to project above the top level of the slab, or by leaving an
10 empty space in one side of the channel for the flanges of the wheels of the rail vehicle.

 Throughout the description and claims of this specification the word "comprise" and variations of that word, such as "comprises" and "comprising",
15 are not intended to exclude other additives or components or integers.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A method of constructing a rail track on a track-receiving concrete slab provided with channels serving to receive rails of the rail track, wherein, after
5 concrete forming the track-receiving slab has set, the method comprises at least the following steps:
 - a) stretches of rail are put in place above the channels in the track-receiving slab, each rail having a foot coated with a casing of resilient material
10 whose thickness is such that the foot as coated with the casing is slightly wider than the channel;
 - b) the foot as coated with the casing is inserted into the channel by force, the shape of the channel being suitable for reacting to compression
15 forces from the resilient material of the casing, with a reactive force tending to hold the rail at the bottom of the channel;
 - c) an empty volume situated in a top portion of the channel on either side of the rail is filled with resin which seals the installation.
20
2. A method of constructing a rail track according to claim 1, wherein prior to step a), rails in each stretch are welded together end-to-end.
3. A method of constructing a rail track according to any one of claims 1 to
25 2, wherein at least locally, each channel has a width that tapers going from a bottom to the top of the channel.
4. A method of constructing a rail track according to claim 3, wherein said channels are of trapezium-shaped cross-section, a larger base of the
30 trapezium constituting the bottom of the channel.

5. A method of constructing a rail track according to claim 4, wherein edges of the channel are inclined at an angle in the range of between 3° to 15° relative to a plane perpendicular to the bottom of the channel.
- 5 6. A method of constructing a rail track according to any one of claims 1 to 5, wherein the casing coating the foot of each of the rails has a shape that has an extra thickness of a few millimetres relative to a complementary shape of the channel.
- 10 7. A method of constructing a rail track according to any one of claims 1 to 6, wherein, prior to step c), a primer is deposited on edges of the channel and on sides of the rail so as to improve adhesive keying of the resin.
8. A method of constructing a rail track according to any one of claims 1 to 15 7, wherein the track-receiving slab is obtained by casting a mass of wet concrete continuously along a determined path.
9. A method of constructing a rail track substantially as herein described with reference to the accompanying drawings.

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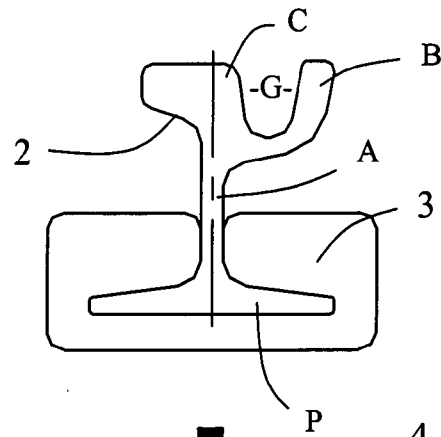


FIG 1

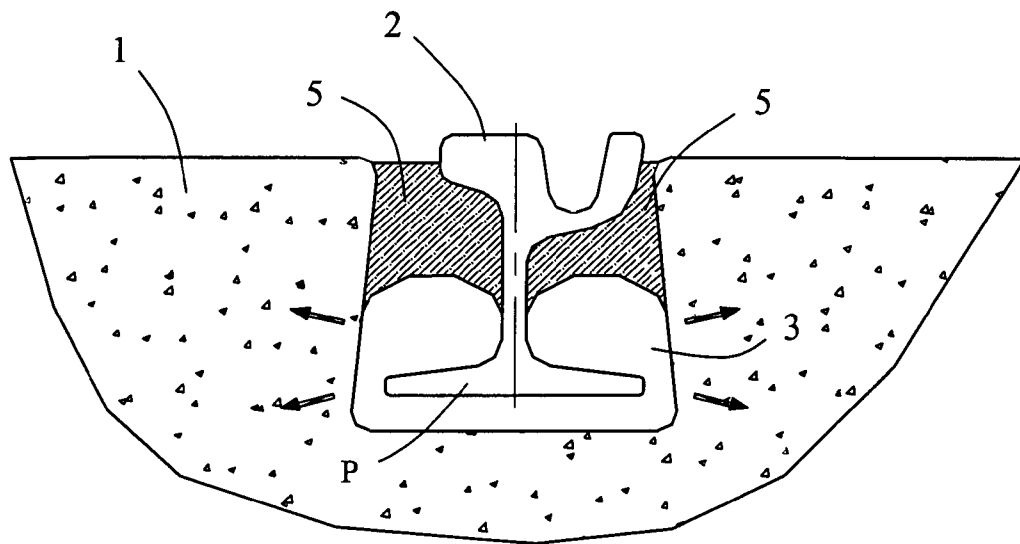
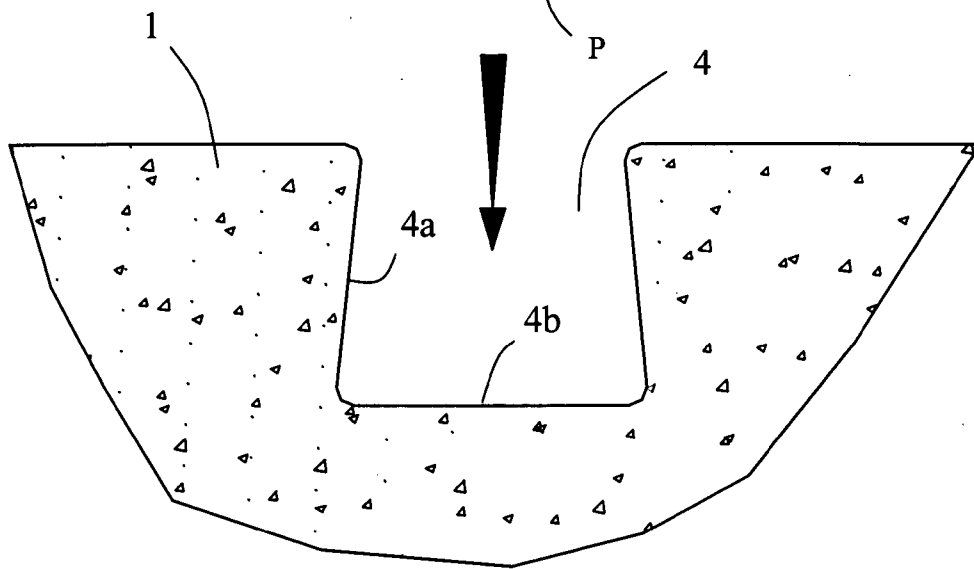


FIG 2