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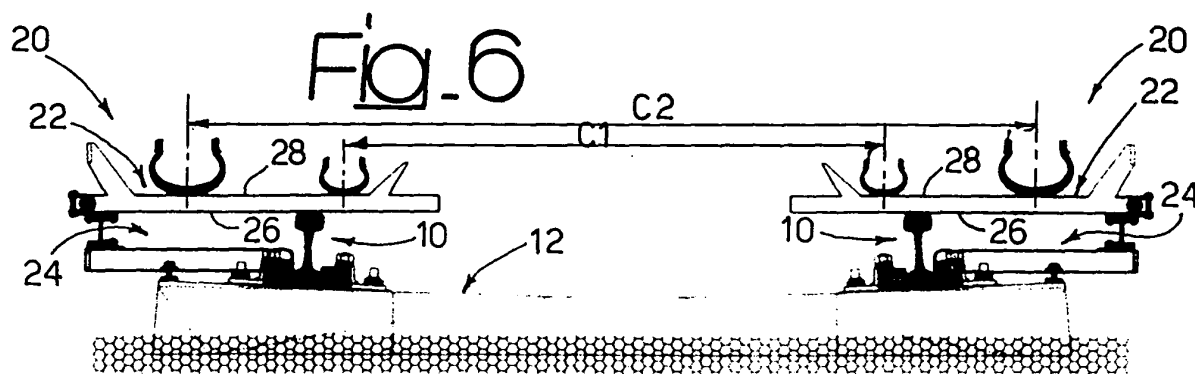
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(54) **A system for forming a roadway on a railway line**

(57) A system for forming a roadway on a railway line, comprising:

- at least a bracket (40) provided with fastening means (46) co-operating with the flange (14) of a railway rail (10), and
- at least a board (22) articulated relative to the brack-

et (40) about an axis (38) parallel to the rail (10), the board (22) being movable about said axis (38) between a first operative position in which the board extends laterally to the rail and a second operative position in which the board bears on the head (16) of the rail (10) and forms a roadway (28).



EP 1 355 008 A1

Description

[0001] The present invention relates to a system for forming a roadway on a railway line.

[0002] In the remainder of the description and in the claims, the term "roadway" means a track whereon road vehicles equipped with wheels fitted with tyres can move. Railway beds are notoriously unsuitable for the transit of road vehicles. In case of accidents to train in locations that are difficult to access, such as tunnels, it is therefore particularly difficult to access the site of the accident with rescue vehicles of the kind that travel on roads, such as ambulances or fire brigade vehicles.

[0003] The aim of the present invention is to provide a system that can form in simple and rapid fashion a roadway on the railway rails to allow the transit of road vehicles.

[0004] According to the present invention, said aim is achieved by a system having the characteristics set out in the claims.

[0005] The present invention shall now be described in detail with reference to the accompanying drawings, provided purely by way of non limiting example, in which:

- Figure 1 is an elevation view of a system according to the present invention in a first operative position,
- Figure 2 is an elevation view of the system of Figure 1 in a second operative position,
- Figures 3 and 4 are plan views of the system according to the invention in the operative positions illustrated in Figures 1 and 2,
- Figure 5 is a plan view of a system according to the present invention forming a roadway on a railway line,
- Figure 6 is an elevation view of the system of Figure 5,
- Figure 7 is a detail in enlarged scale of the part indicated by the arrow VII in Figure 1,
- Figure 8 is a plan view in enlarged scale of the part indicated by the arrow VIII in Figure 1,
- Figure 9 is an elevation view of an embodiment of the device for fastening a system according to the present invention to the rail,
- Figure 10 is a plan view of the fastening device of Figure 9,
- Figure 11 is an enlarged scale view of the part indicated by the arrow XI in Figure 9, and
- Figure 12 is an enlarged scale view of the part indicated by the arrow XII in Figure 10.

[0006] With reference to Figures 1 through 4, the number 10 designates a railway line conventionally fastened to a plurality of sleepers 12. With reference to Figures 1 and 2, the rail 10 has a head 14 and a flange 16 which bears on the upper surface of the sleepers 12. Traditional fastening members, indicated as 18 in Figure 3, fasten the flange 16 of the rail 10 to the sleepers 12.

[0007] A system able to form a roadway on the rail 10 is globally designated as 20 in Figures 1 through 6. The system 20 comprises a plurality of boards 22 connected to the flange 16 of the rail 10 by means of a plurality of attachment devices 24.

[0008] Each board 22 is formed by a panel of substantially rectangular shape made of metallic material, having two parallel planar surfaces 26, 28. Each board 22 is preferably provided with two longitudinal projections 30, 32 which protrude from the surface 28 and extend parallel to the longitudinal edges of the board 22 over the entire length of the board. With reference to Figures 3 and 8, each board 22 is provided along its longitudinal edge 34 with a plurality of windows 36 open along the edge 34. In correspondence with each window 36 is positioned a pivot pin 28 which is fixed relative to the board 22 and 22 and with its axis parallel to the longitudinal edge 34.

[0009] With reference to Figures 9 through 12, the attachment device 24 for connecting the boards 22 to the flange of the rail 10 shall now be described. The attachment device 24 comprises a bracket 40 formed by two mutually parallel metallic arms 42. Each of the two arms 42 has a fork shaped end 44.

[0010] The bracket 40 is connected to the flange 14 of the rail 10 by means of a pair of attachments 46 positioned at opposite parts relative to the organs 18 which fasten the rail 10 to the sleeper 12. With reference to Figures 11 and 12, each attachment 46 comprises a plate 48 positioned below the flange 14 and two fastening blocks 50, 52 fastened to the plate 48 by means of screws 54, 56. A layer of electrically insulating material 58 is provided to insulate the rail 10 electrically from the plate 48 and from the blocks 50, 52.

[0011] The fork shaped portion 44 of each arm 42 of the bracket 40 is articulated to a hole 60 of the block 52 by means of a pivot pin 62.

[0012] As shown in Figures 9 and 10, the bracket 40 bears a transverse support 64 which joins the two parallel arms 42 to each other. The support 44 bears a support element 66, adjustable in the vertical direction, which bears on the upper surface of the sleeper 12. The support element 66 allows to adjust the vertical position of the bracket 40.

[0013] With reference again to Figures 9 and 10, the bracket 40 bears at its opposite end relative to the rail 10 an attachment 68 for fastening a continuous I-section bar 70 which extends parallel to the rail 10.

[0014] With reference to Figures 7, 8 and 9, the section bar 70 bears at its upper end attachment organs 72 on each of which is fastened a C flange 74 whose open end is closed by a bolt 76. The C flange 74 pivotally engages a corresponding pivot pin 38 of the board 22, in such a way as to form a hinge with its axis parallel to the rail 10. The axis of the hinge formed by the pivot pin 38 and by the C flange 74 is situated substantially at the same height as the head 14 of the rail 10.

[0015] With reference to Figures 1 and 2, each board

22 of the system according to the present invention is movable between a first operative position illustrated in Figure 1 and a second operative position illustrated in Figure 2. The board 22 is moved from one to the other of its operative positions by means of a rotation of about 180° about the hinge axis formed by the pivot pins 38 and by the flanges 74 in mutual co-operation.

[0016] In the operative position shown in Figure 1, each board 22 extends parallel to the rail 14 and laterally thereto. In this position, the surface 26 of the board 22 forms a lateral walking plane relative to the rail 10. It can be noted that in the position of Figure 1 the projecting appendage 30 has an end with a bearing surface 78 which bears against the front end of the bracket 40. As shown in Figure 1, a stationary support 80 parallel to the rail 10 can also be provided to support the end edge 82 of the board 22.

[0017] When the board 22 is rotated towards the position of Figure 2, the surface 26 of the board bears on the head 14 of the rail. The surface 28, oriented upwards in the position of Figure 2, constitutes a rolling track which can be engaged by the wheels of a vehicle having wheels fitted with tyres. The two continuous longitudinal projections 30, 32 delimit the rolling track and provide for the lateral containment of the wheels of the vehicle.

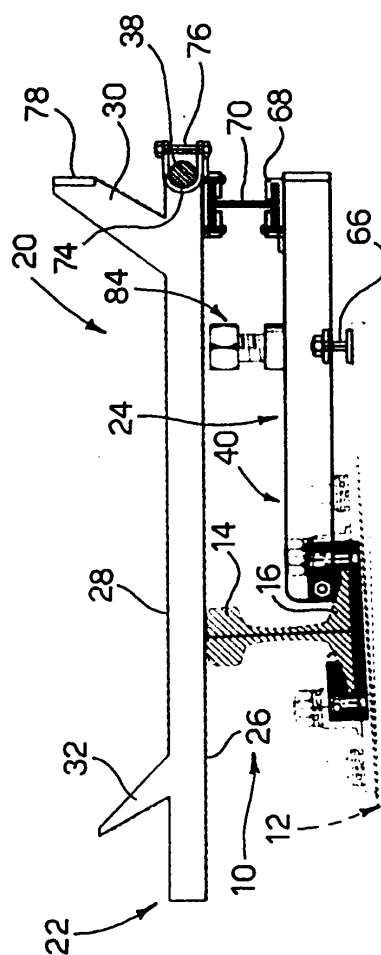
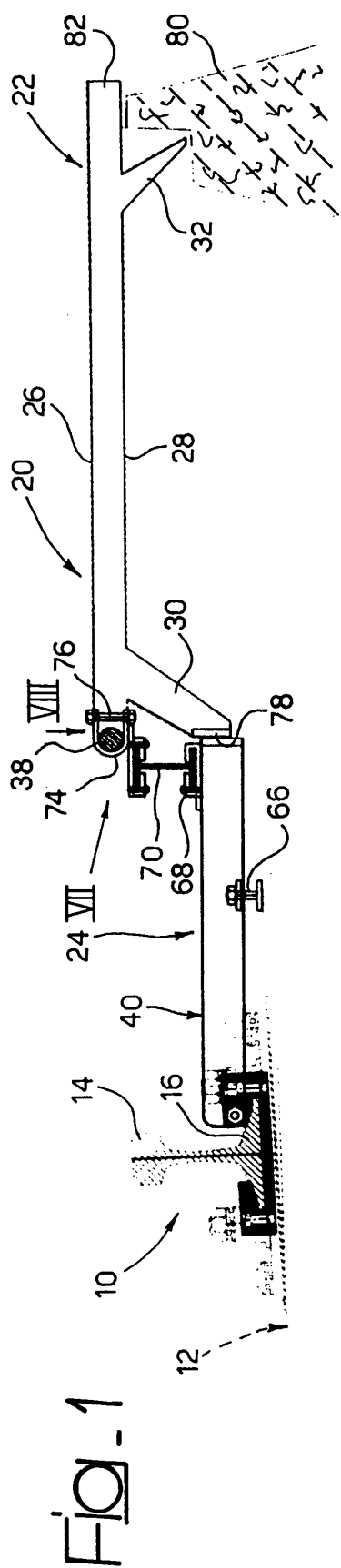
[0018] The deployment of the rolling track is extremely simple and rapid. It is sufficient to rotate the board by 180° until bringing it in abutment against the head of the rail. The board is in a stable position in its condition of abutment against the rail and requires no securing. To enhance the rigidity of the setting of the board, an auxiliary support element 84 borne by the bracket 40 can be provided. The auxiliary support element 84 can have adjustable length and is preferably positioned in correspondence with the support element 66 which bears on the sleeper. The board 22, thanks to its bearing on the head of the rail 10, is able to sustain a heavy load and hence can form a roadway suitable even for heavy rescue vehicles, such as ambulances or fire brigade vehicles.

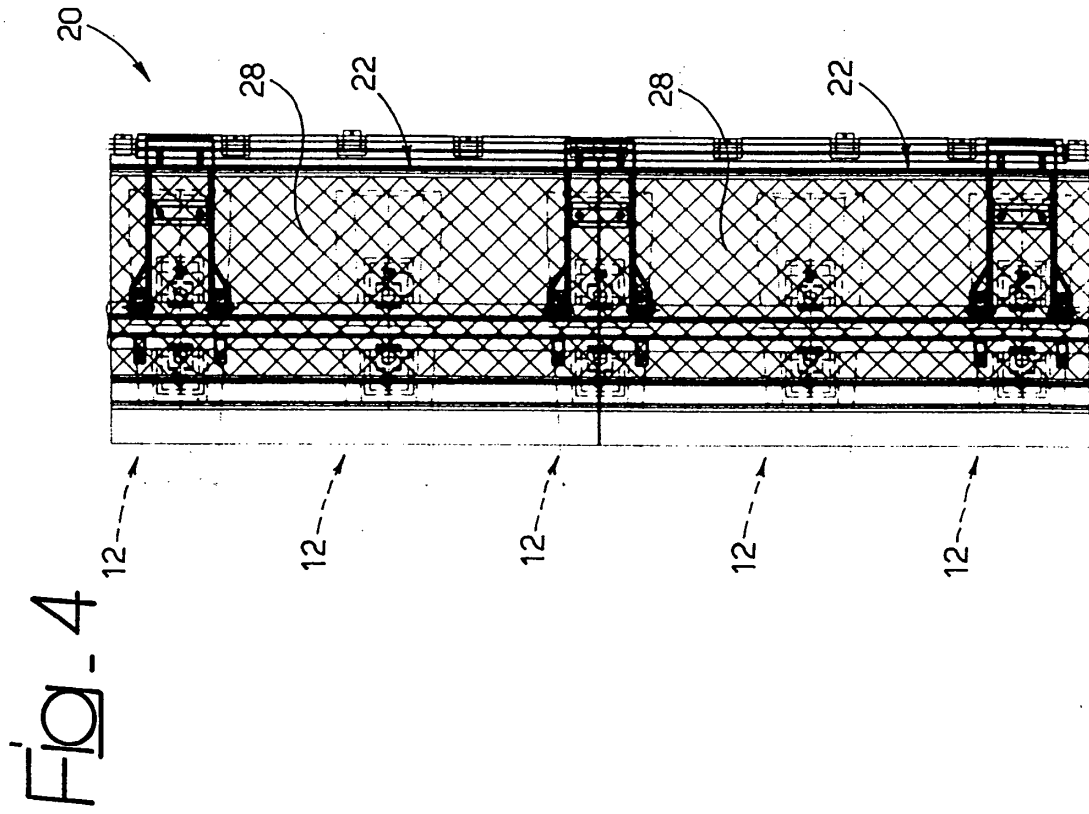
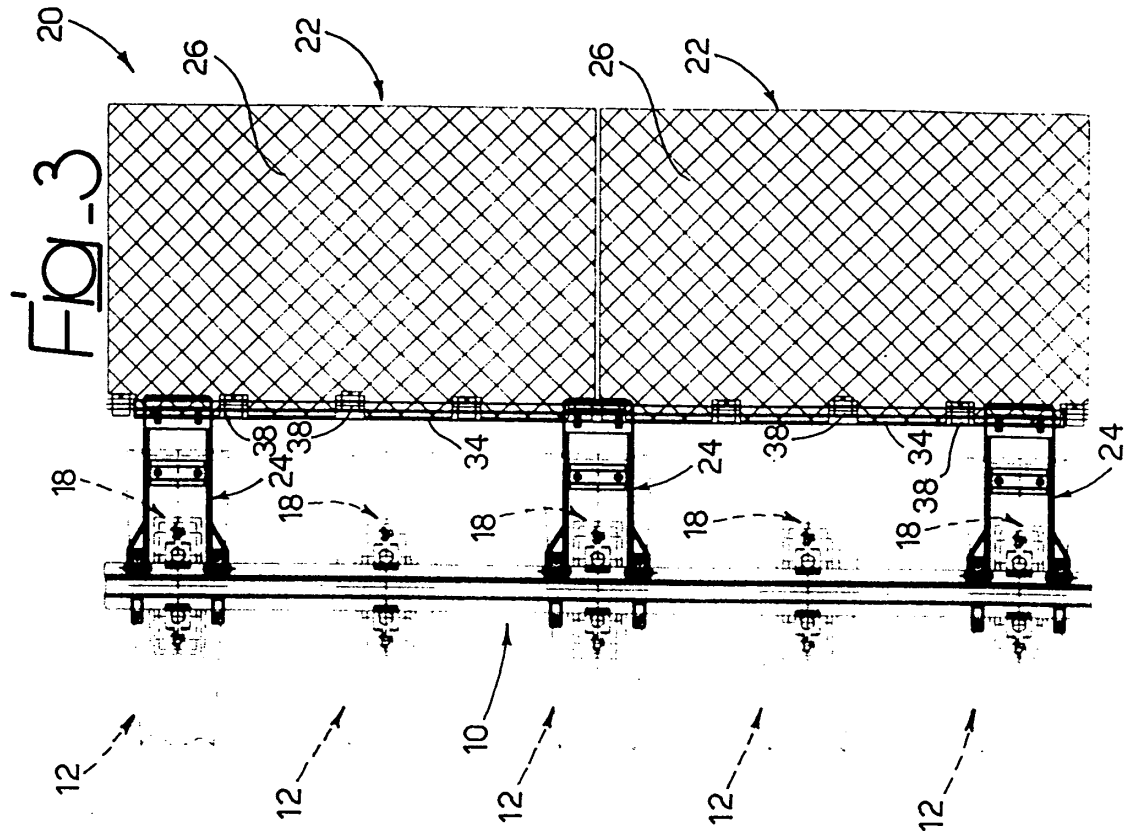
[0019] Figures 5 and 6 illustrate the roadway formed by two series of boards 22 which bear on each of the tracks 10 of a railway line. As shown in Figure 6, the roadway formed by the two boards 22 can receive vehicles with a gauge ranging between the values C1 and C2.

[0020] The boards 22 could also be associated to an automatic control device to rotate the boards from one operative position to the other. An important characteristic of the present invention is that, when the boards are in the lateral position with respect to the rail, the devices for attachment to the flange of the rail do not project from the contour of the sleeper and do not hamper the operation of machines for ridging the railway ballast.

Claims

1. A system for forming a roadway on a railway line, **characterised in that** it comprises:
 - at least a bracket (40) provided with fastening means (46) co-operating with the flange (14) of a railway rail (10), and
 - at least a board (22) articulated relative to the bracket (40) about an axis (38) parallel to the rail (10), the board (22) being movable about said axis (38) between a first operative position in which the board extends laterally to the rail and a second operative position in which the board bears on the head (16) of the rail (10) and forms a roadway (28).
2. A system as claimed in claim 1, **characterised in that** said board (22) is formed by a metallic panel with rectangular shape articulated to said axis (38) along one of its longitudinal edges.
3. A system as claimed in claim 2, **characterised in that** said board is provided with longitudinal projecting portions (30, 32) which project from a planar surface (28) and which laterally delimit a rolling track (28).
4. A system as claimed in claim 1, **characterised in that** in the aforesaid first operative position the board (22) forms a walking plane (26) that is lateral relative to the rail (10).
5. A system as claimed in claim 1, **characterised in that** said bracket (40) is articulated to the flange (16) of the rail (10) about an axis parallel to the axis of the rail.
6. A system as claimed in claim 5, **characterised in that** said bracket (40) comprises a support element (66) which bears on the upper surface of a sleeper (12) in a position distanced from the axis of articulation of the bracket (40).
7. A system as claimed in claim 1, **characterised in that** said bracket (40) bears a continuous section bar element (70) parallel to the rail (10).
8. A system as claimed in claim 7, **characterised in that** said continuous section bar element (70) is connected to a plurality of hinges (38, 74) for the articulation of the board (22).
9. A system as claimed in claim 1, **characterised in that** the bracket (40) bears an auxiliary support element (84) with adjustable height against which the board (22) bears in said second operative position.





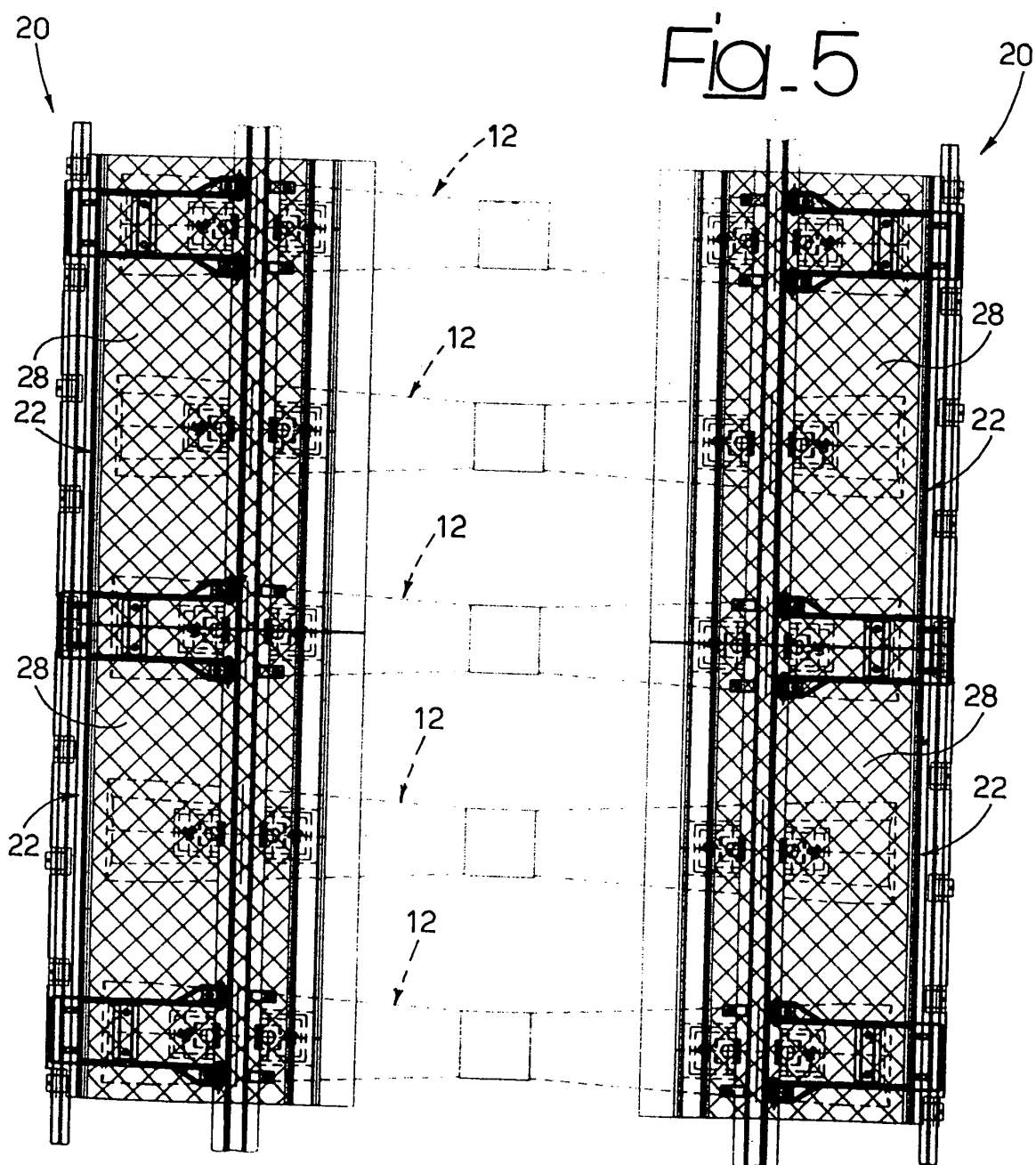
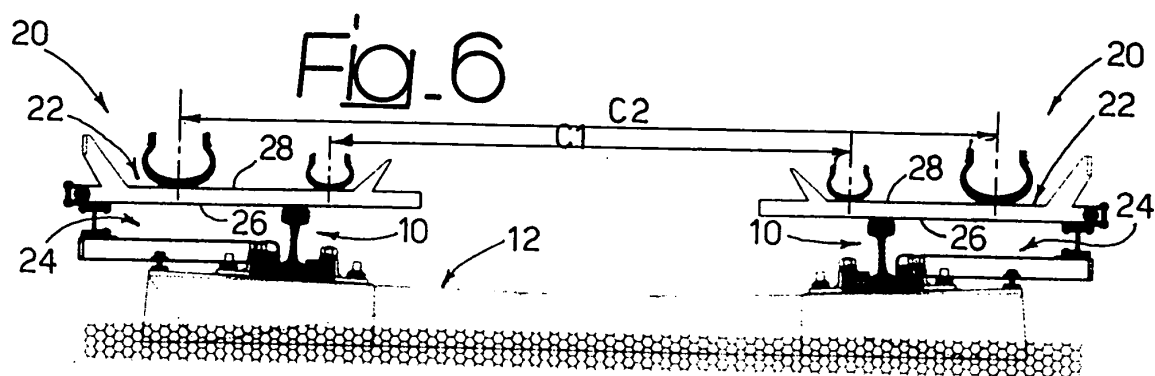


Fig. 7

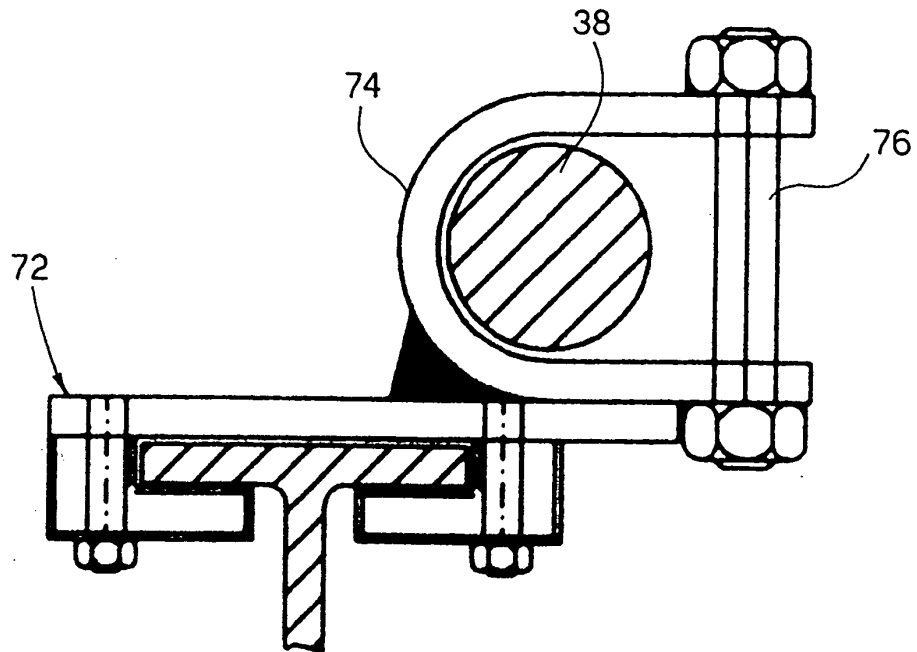
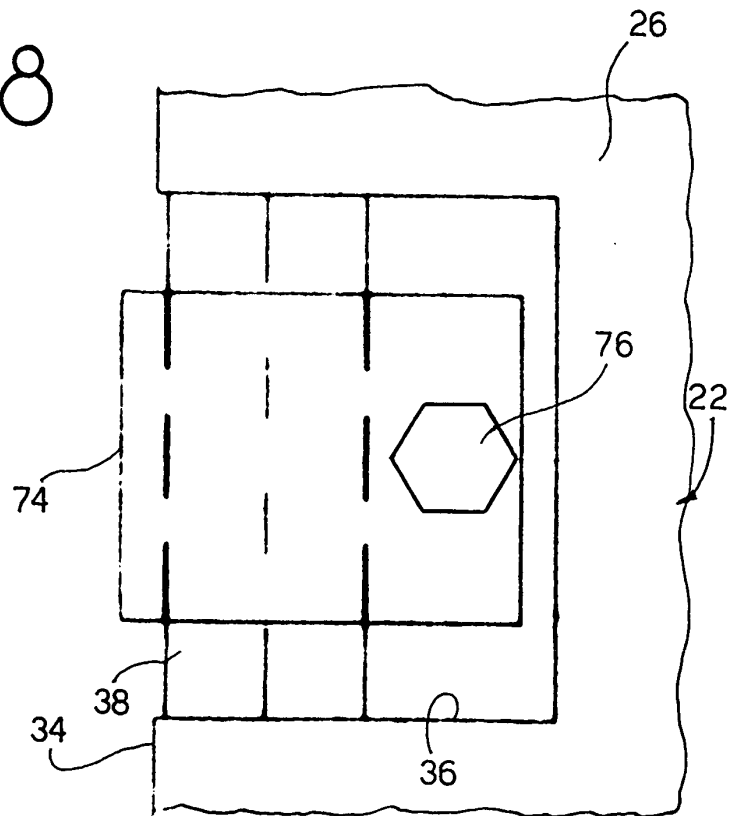
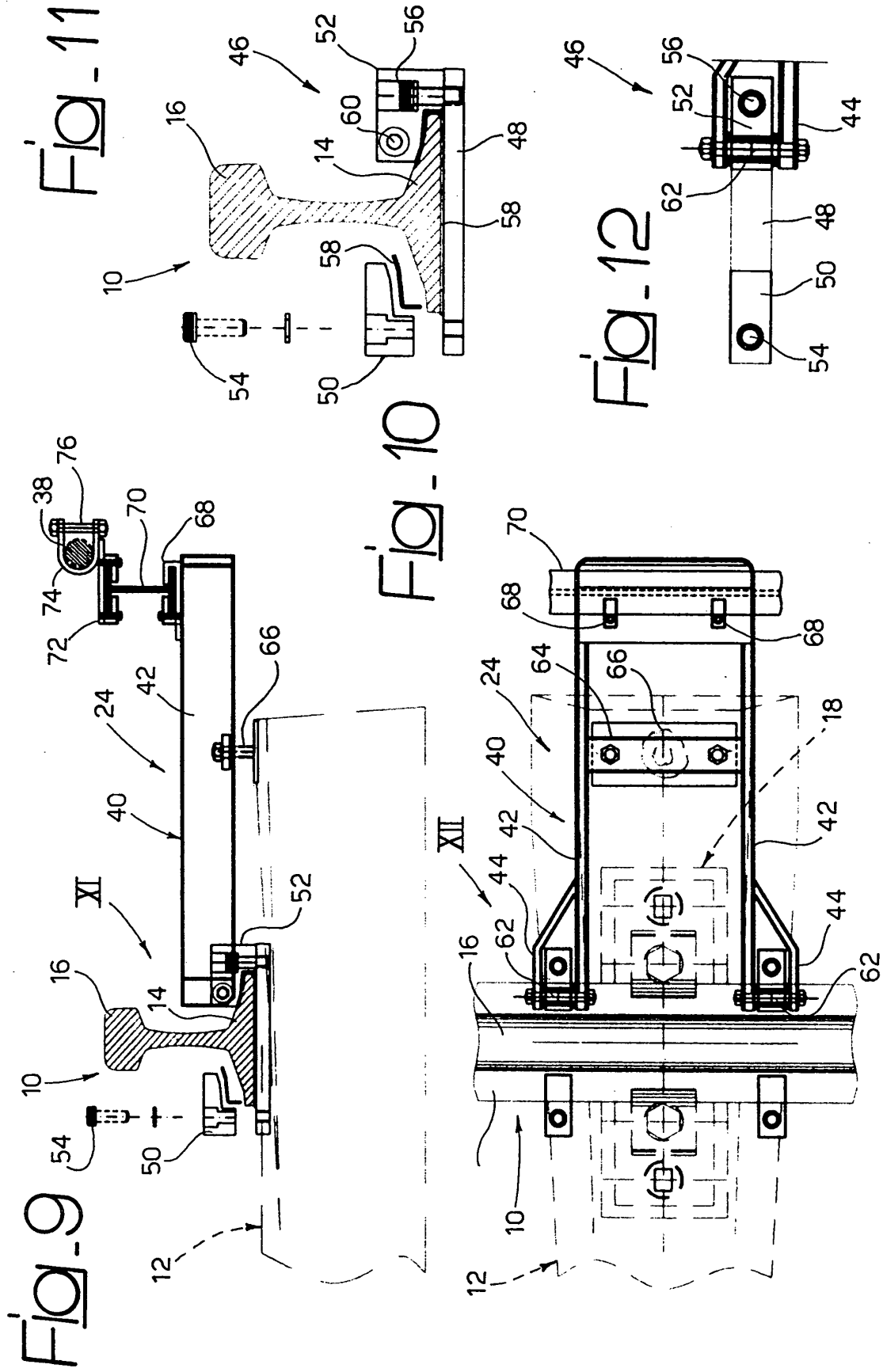


Fig. 8







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EUROPEAN SEARCH REPORT

Application Number
EP 03 00 8101

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
A	US 3 861 591 A (RECTOR ROGER F) 21 January 1975 (1975-01-21) * abstract; figures 1,3,4 *	1,2,4	E01C9/00 E01B26/00
A	DE 195 44 666 A (WAYSS & FREYTAG AG) 5 June 1997 (1997-06-05) * abstract; figure 15 *	1	
A	DE 299 03 622 U (EISENREICH JAN) 27 May 1999 (1999-05-27) * claim 1; figure 1 *	1	
			TECHNICAL FIELDS SEARCHED (Int.CI.7)
			E01B E01C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 2 July 2003	Examiner De Neef, K
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 00 8101

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The members are as contained in the European Patent Office EDP file on
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02-07-2003

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