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(54) Roller device for train deviators

(57) The present device is suitable for use in the railway sector, and especially that of armament deviators. This allows the needles to run without there being the need to lubricate the bearings.

This device is composed mainly of a U-shaped, metal support (1) and a series of accessories, such as a metal supporting plate (7) and metal shims (9). The support (1) has a horizontal, square base with sides (4), which are normal at its base (3).

These sides (4) feature a series of holes in which the end parts of one or more pivots (5) are placed. On said pivot/s (5) rotate stainless steel rollers (2) inside which there are ferrules (6) made from self-lubricating plastic material.

The support (1) is placed on the aforementioned accessories.

The base (3) of the support (1), the shims (9) and the supporting plate (7) feature holes for the screws (10) used to secure the support (1) to the accessories and to the beam (11).

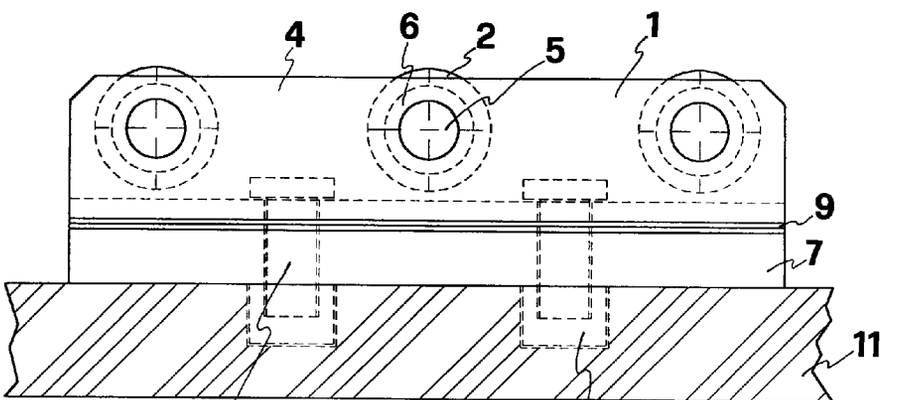

FIG. 7

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Description

Technical field

This device is used effectively in the railway sector. It is used in the field of armament deviators activated by control boxes fitted either to wooden or reinforced concrete beams.

Background art

It is common knowledge that a train deviator is composed of two parts: a crossover and a changeover. The latter is composed of needles which are made from specially treated tracks which are thinned at one end so that the needle end can be hidden under the adjacent railheads, which are known as counterneedles.

These needles are mobile; in order to facilitate their movement, they are made to run across a series of steel bearings which are fitted to the deviator's beams.

These bearings, however, require lubrication in order to reduce friction between the needle and the surface of the bearings.

This operation is carried out by railway personnel by applying thick oil or grease to the bearings on a weekly or fortnightly basis.

The financial burden to be shouldered by the train company and ensuing from having to carry out this simple, but essential, operation is therefore comprehensible.

Disclosure of invention

The purpose of the invention in question is creating a device capable of allowing the needles to run across the bearings without there having to be the need for regular bearing lubrication.

These and other objectives are reached by the present device which is composed of a U-shaped metal support; symmetrical holes are drilled on either side of the U-shaped metal support. One or more pivots, on which as many stainless steel rollers lie, are placed inside the aforementioned holes.

These rollers rotate around a horizontal axis and are internally fitted with self-lubricating, plastic ferrules or with roller or ball bearings. These ferrules or bearings are placed on the same axis of the aforementioned rollers. The support is composed of a horizontal, quadrangular base and by the aforementioned vertical sides. The pivots are fixed to these sides by means of a series of soldered points or by using any other rigid, but easily-removable system.

The support is placed on a series of accessories, such as a quadrangular supporting plate and shims consisting of small quadrangular metal plates.

Holes have been drilled in the base, shims and supporting plate in order to allow screws to be fitted. These screws secure the support to the accessories as well as securing the support to the beam.

The use of stainless steel for the rollers and self-lubricating plastic material (such as ertalyte, for example) for the ferrules makes the device independent of any need for lubrication. As the bearings are not lubricated, there ensues an immediate recovery of human resources and the elimination of lubricant costs. As a result of this, there is no pollution of the wood, gravel and soil.

There is no need for particular precautions to be adopted when this device is being installed, nor does it interfere with the installation of the control-manoeuvring pulleys or any emergency exchange stopping.

Railway traffic does not have to be stopped in order to install this device, nor do any modifications of its components need to be made when the unit is being installed.

Pivot-blocking carried out by means of the aforementioned soldered points or any other easily-removable, rigid system allows worn pivots and rollers to be removed easily and replaced with new ones; the support is therefore recyclable.

Brief description of drawings

The above objects, technology, feature and effect of the present invention will become apparent upon the study of the following preferred embodiment and drawings in which:

- figure 1 shows the present device, as viewed from the side;
- figure 2 shows the same device, as viewed from the front;
- figure 3 shows this device, as viewed from above;
- figure 4 shows the unit, as fitted to a train deviator;
- figure 5 shows a train deviator as viewed from above;
- figure 6 shows a transversal section from the top of a train deviator;
- figure 7 shows a device with three rollers, as viewed from the side;
- figure 8 shows the same device, as viewed from the front;
- figure 9 shows this device, as viewed from above.

Mode for Carrying Out the Invention

Referring now to the enclosed figures, the device here described is composed basically of a U-shaped metal support 1 on which one, two or three stainless steel rollers 2 with a horizontal rotating axis are fitted. The support 1 is composed of a rectangular horizontal base 3 and by two normal sides 4 on this base 3. On said sides 3 there are symmetrical holes in which the extremities of one, two or three pivots 5 are placed.

On said pivots 5 rotate the rollers 2 internally fitted with ertalyte ferrules 6.

These ferrules 6 are fitted on an axis which is the same of the aforementioned rollers 2.

The support 1 is placed on a quadrangular supporting plate 7; the height of the rollers 2 from the running surface of the bearings 8 is adjusted by placing between the supporting plate 7 and the base 3 of the support 1 a series of shims 9 consisting of quadrangular, metal plates, one-two mm in thickness.

Finally, the support 1 is secured to the shims 9 and to the plate 7 by means of screws 10.1. All these components are then secured to the beam 11 by means of screws 10.2 so that the generator of the roller 2 is approximately two millimetres higher than the running plane of the bearing 8. The purpose of adjusting the height of the rollers 2 by using shims 9 is allowing the support 1 and rollers 2 to be used, both according to the various pre-existing types of fittings and to the varying degrees of wear of the beam 11, before the device in question is installed. Furthermore, in the long run, this adjustment allows the inevitable wear of the system comprising the roller 2 - pivot 5 - ferrule 6 to be compensated for.

The pivots 5 are fixed to the sides 4 by means of a series of soldered points.

The aforementioned screws 10.1, 10.2 are placed in holes drilled in the base 3, in the shims 9 and supporting plate 7. The holes used to secure the single-roller device to the beam 11 and those used to secure the double-roller to the beam 11 share the same interaxis; as a result, in both cases the supporting plate 7 and the shims 9 are the same in size.

The support 1 and its accessories are placed next to the bearing 8 so that the sides of these components are in direct contact with one another. Once this has been carried out, the screw 10.2 - which allows the support 1 to be fixed to the beam 11 - will be placed in the vicinity of the shorter side of the base 3 and will prevent the support 1 from rotating.

Given stroke of the needle 12 and the width of the flange of the needle 12 itself, the double or triple-roller device will be placed near the bearings 8 located near the top of the train deviator. On the other hand near the rear end of the deviator, the single or double-roller device will be used.

In practical terms, if the stroke of the needle 12 in the exact place in which the device is fitted is shorter or the same as the flange of the needle 12 in the same position, a single-roller device will be used. If the stroke of the needle 12 in the exact place in which the device is fitted is longer than the flange of the needle 12 in the same position, a double or triple-roller device will be used.

After the first device - double or triple-roller - has been fitted next to the first or second bearing 8 located near the top of the deviator, the following single or double-roller devices will be placed next to every four or five bearings 8, in other words every three/four metres.

When the needle 12.1 is in contact with the counter-needle 13.1, it lies on the bearings 8. When the needle 12.1 moves away from the counter-needle 13.1 during deviation operations, it moves onto the rollers 2 of the device in question and stays there for the whole stroke, even when the needle 12.1 has reached its maximum opening angle.

Vice-versa, the needle 12.2 - moved away from the counter-needle 13.2 - begins its stroke on the rollers 2 and is set on the bearings 8 when it is a few millimetres away from the counter-needle 13.2.

The weight of train carriages is therefore borne by the bearings 8 and not by the rollers 2.

The use of stainless steel for the rollers 2 and ertalyte for the ferrules 6 makes the device independent of any need for lubrication.

As the pivot 5 is blocked by means of two soldering points, the support 1 can be re-cycled. When the pivots 5 and rollers 2 are worn out, by removing the soldering points, the pivots 5 and rollers 2 can be removed and replaced with new ones.

Thanks to the way the device in question has been designed, various modifications can be made. Furthermore, all components may be replaced with similar ones having the same technical characteristics.

The above variations include the position of the means used to secure the device in question to the beam 11.

Figures 7, 8 and 9 show a triple-roller device which is secures to the beam 11 by means of headless screws 10.3 with a hexagon embedding and ferrules 14. The ferrules 14 are fitted to the beam 11 in advance. The holes, into which the screws 10.3 are fitted, are drilled in the base 3, plate 7 and shims 9.

As described earlier, the support 1 is also placed on the plate 7; height adjustments are made on the rollers 2 regarding the running plane of the bearings 8 by placing various metal quadrangular plate shims 9 between the supporting plate 7 and the base 3 of the support 1.

Finally, the support 1, shims 9 and plate 7 are secured to the beam 11 by means of the headless screws 10.3 with a hexagon embedding which enter the ferrules 14.

In this case, there is no need for the support 1 and its accessories to be placed in contact with the bearing 8, because any rotation will be avoided thanks to the two screws 10.3.

Claims

1. Roller device for train deviators, characterised by the fact that this device is composed mainly of a U-shaped metal support (1) on which one or more stainless steel rollers (2) are placed - with a horizontal rotating axis - and various accessories such as a quadrangular supporting plate (7) and a series of quadrangular metal plate shims (9), in which the support (1) has a horizontal, quadrangular base (3) with sides (4) which are vertical and therefore nor-

mal at base (3); a series of symmetrical holes are drilled on either side of the support (1); in these holes, by means of a series of soldering points or any other rigid, but easily removable system, the end parts of one or more pivots (5) are placed; on these pivots (5) rotate rollers (2) inside which there are ferrules (6) made of self-lubricating plastic material or roller or ball bearings; said ferrules (6) or bearings are placed with the same axis of the aforementioned rollers (2); said support (1) is secured to the beams (11) by means of screws (10.2, 10.3) which are fitted inside holes drilled in the base (3) and enter directly into the beams (11) or in ferrules (14) fitted to the beams (11) themselves; the quadrangular support plate (7) and the shims (9) also feature holes for the screws (10.1) used to secure the support to the plate and to the shims (9) and/or screws (10.2, 10.3) which in turn secure the support (1) itself to the beam (11).

2. A roller device for train deviators, as claimed in Claim 1, characterised by the fact that the support (1) is placed on the supporting plate (7), therefore the rollers (2) are adjusted in height in relation to the running plane of the bearings (8) by placing a series of shims (9) between the base (3) of the support (1) and the supporting plate (7) so that the roller's (2) generator is 0.2 to 3 millimetres higher than the running plane of the bearing (8); said support (1) is fixed to the beams (11) by means of screws (10.2, 10.3); the support (1) and its accessories are placed next to the bearing (8) so that the side plates of the support (1) and those of the bearing (8) are in direct contact or very near to each other, depending on the position of the screws (10.1, 10.2, 10.3) used.

3. A roller device for train deviators, as claimed in the previous Claims, characterised by the fact that the device fitted with two or more rollers (2) is placed near the deviator's top bearings (8), while the device fitted with one or two rollers (2) is used for the bearings (8) at the rear end of the deviator.

4. A roller device for train deviators, as claimed in the previous Claims, characterised by the fact that in the single-roller device and in the device with more than one roller (2) the holes for the screws (10.2, 10.3) securing the device to the beam (11) share the same interaxis; as a result, in both cases the supporting plate (7) and the shims (9) are the same in size.

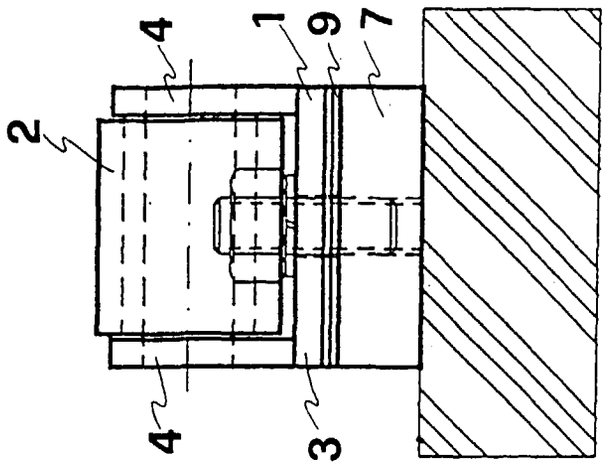

FIG. 2

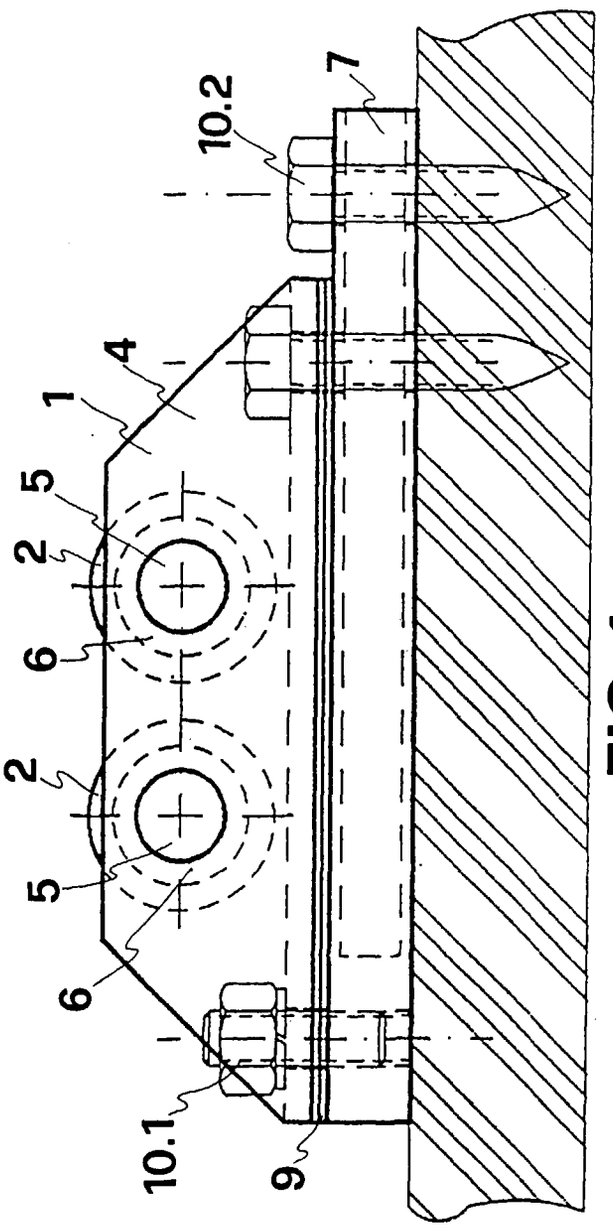

FIG. 1

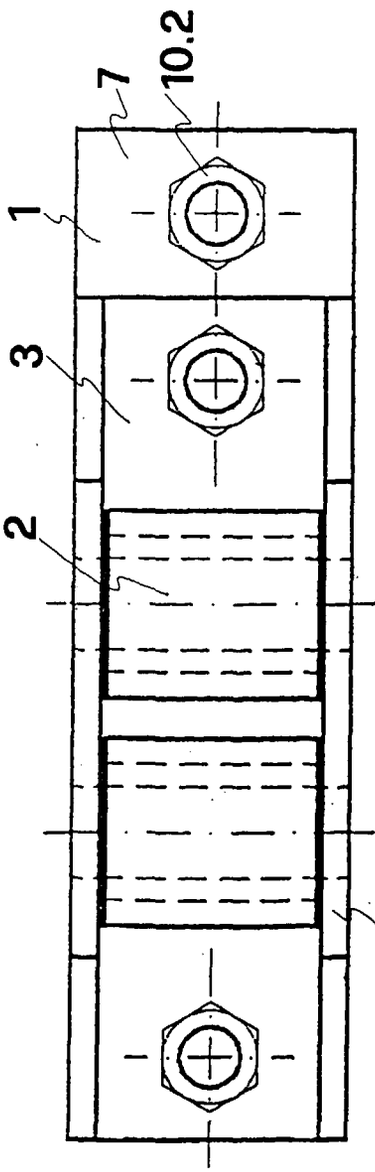

FIG. 3

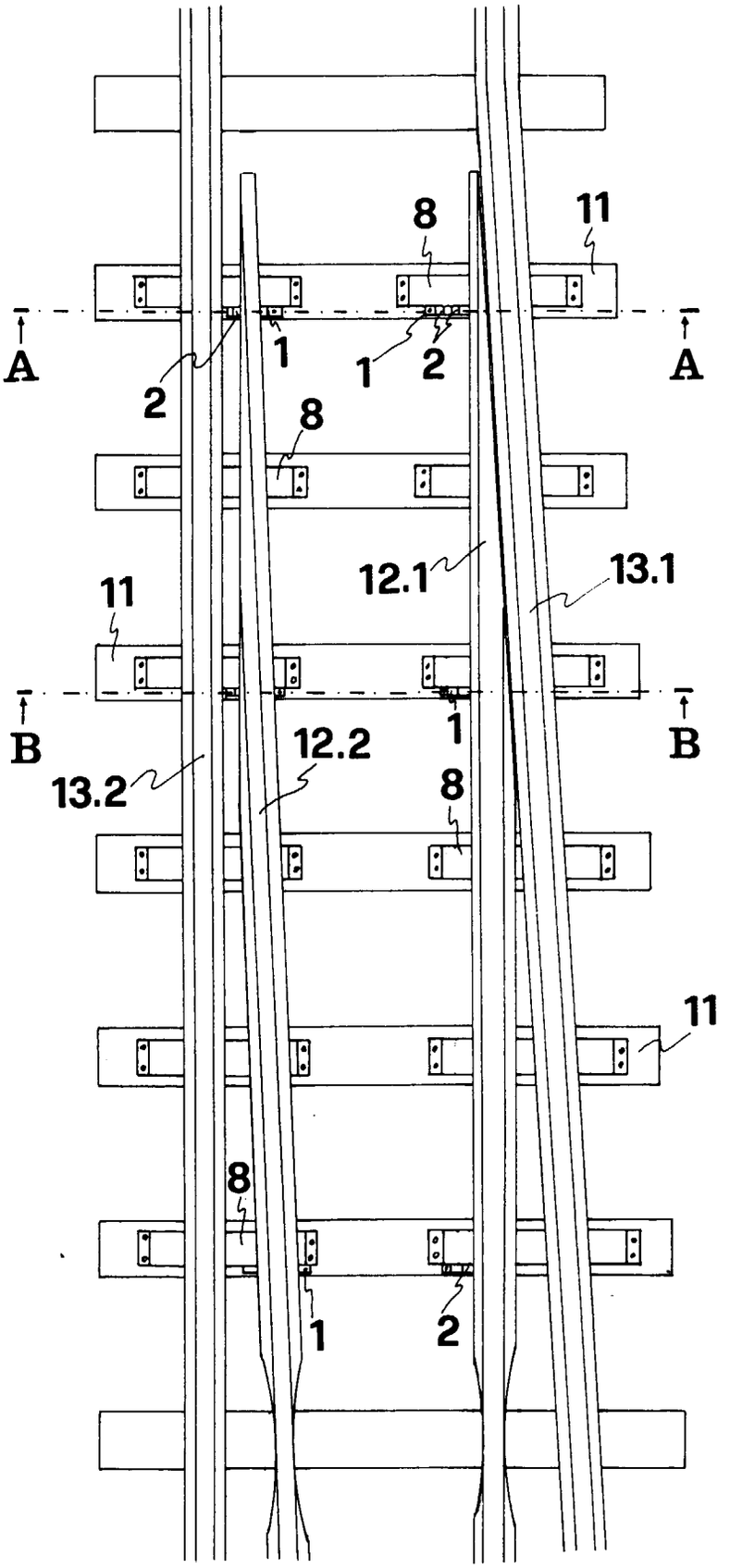

FIG. 4

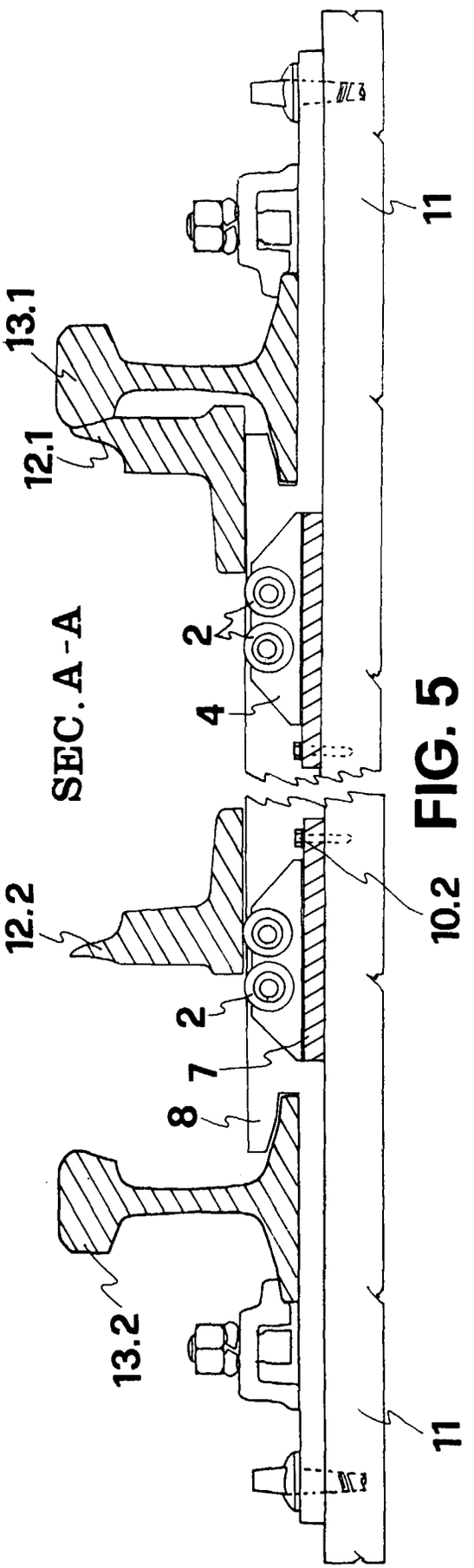
SEC. A-A
13.1
12.1
12.2
13.2
11
2
4
7
8
10.2

FIG. 5

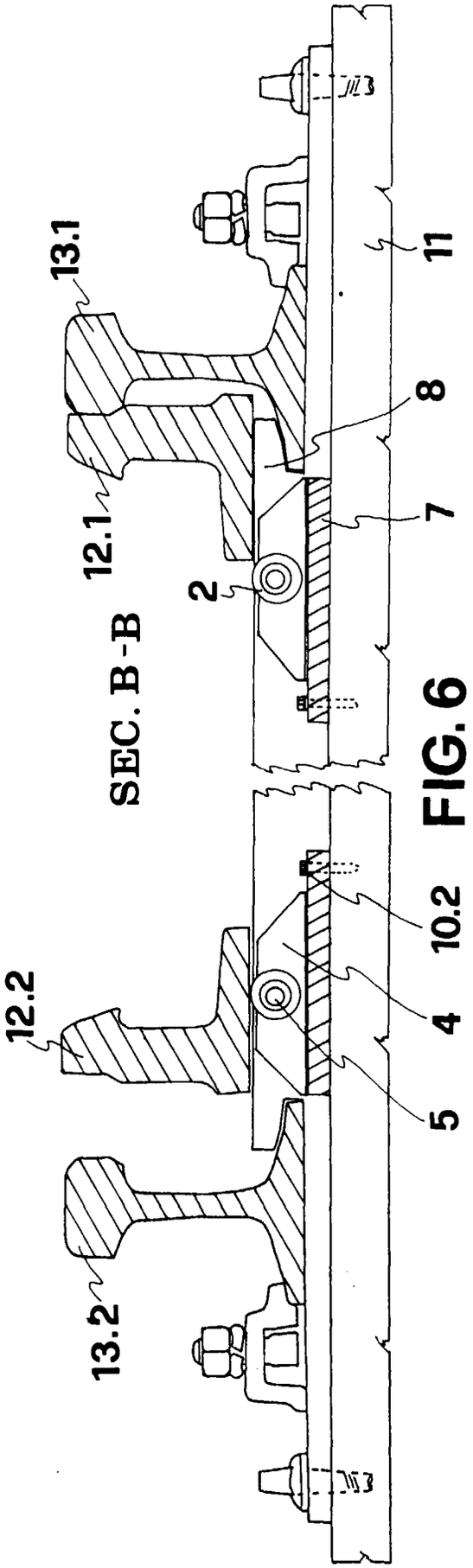
SEC. B-B
13.1
12.1
12.2
13.2
11
2
4
5
7
8
10.2

FIG. 6

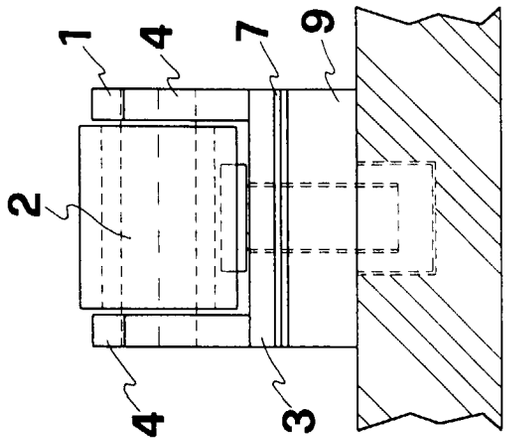

FIG. 8

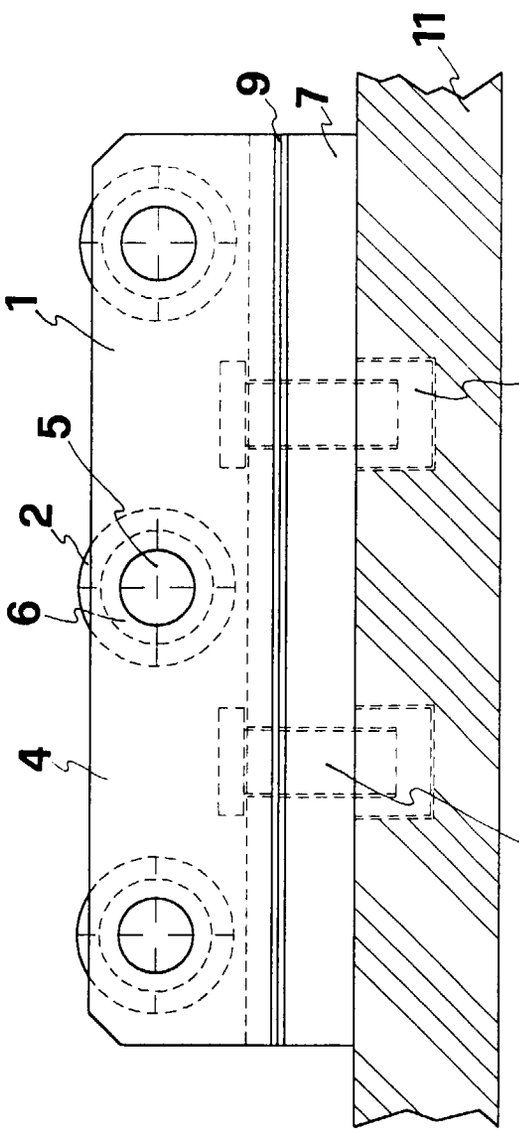

FIG. 7

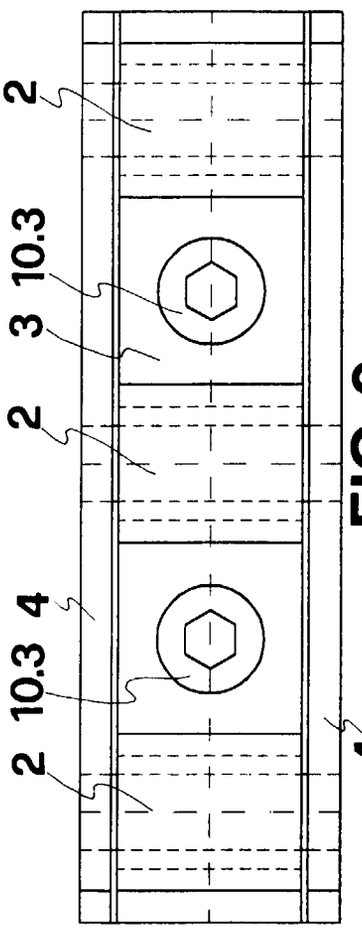

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 96 83 0671

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	AT 375 697 B (MAURER) * page 2, line 39 - page 3, line 7; figures 1-3 *	1,2	E01B7/02
A	DD 66 638 A (DANZSCHER) * column 2, line 8 - column 4, line 9; figures 1-3 *	1	
A	DE 10 56 641 B (PEDDINGHAUS)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E01B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 May 1997	Kergueno, J

CATEGORY OF CITED DOCUMENTS

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