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(54) **Switch blade roller device and turnout provided therewith**

(57) The present invention relates to a switch blade roller device, comprising:
- a connecting bracket arrangeable between two sleepers of a turnout and comprising connecting bracket outer ends arrangeable on or at the sleepers, and a connecting bracket middle part present between the connecting bracket outer ends;
- a roller holder arranged on top of the connecting bracket middle part and with a switch blade roller arranged rotatably therein; and
- wherein the rotation shaft of the switch blade roller arranged rotatably in the roller holder is substantially parallel to the longitudinal direction of the connecting bracket and is situated at a higher level than the connecting bracket middle part and directly above the surface of the connecting bracket.

The present invention further relates to a turnout provided with such a switch blade roller device.

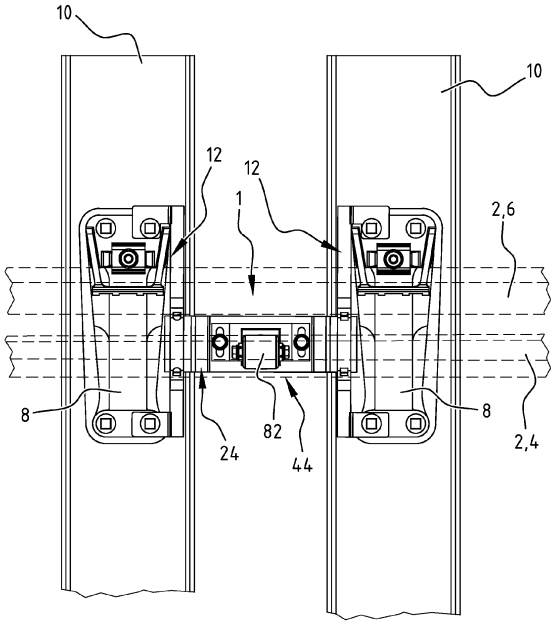

FIG. 2

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Description

[0001] The invention relates to a switch blade roller device and a turnout provided therewith.

[0002] Rail- bound traffic makes use of turnouts in order to guide a rail- bound vehicle such as a train or tram onto or off a chosen rail route. It is known to apply slide chairs with a switch blade roller at such turnouts. The switch rail in an operative position, wherein it lies against the stock rail, rests on the slide chair. In a rest position, wherein the switch rail lies at a position remote from the stock rail, the switch rail is supported by a switch blade roller. A great advantage of applying slide chairs with a switch blade roller is that relatively small switching forces of the switch machine are required without the slide chairs having to be lubricated.

[0003] Switch blade roller devices have to be set after being arranged on a turnout. It is important here that the setting takes place in a correct manner in order to guarantee a reliable operation of the turnout. There is therefore a need for a switch blade roller device which can be set in simple and correct manner.

[0004] Periodic turnout maintenance comprises of rearranging the ballast so that the turnout is once again supported in stable and flat manner by the ballast bed. Switch blade roller devices arranged between sleepers can be damaged during this rearranging of the ballast.

[0005] When a switch blade roller device has been temporarily removed from the turnout for maintenance of the turnout, the setting of the switch blade roller device on the turnout is lost. The process of setting the switch blade roller device will then have to be performed again. Skilled personnel with special training in correct setting of a switch blade roller device are required here in order to prevent assembly errors.

[0006] An object of the present invention is to provide a switch blade roller device wherein said drawbacks do not occur, or at least do so to lesser extent.

[0007] Said object is achieved with the switch blade roller device according to the invention, comprising:

- a connecting bracket arrangeable between two sleepers of a turnout and comprising connecting bracket outer ends arrangeable on or at the sleepers, and a connecting bracket middle part present between the connecting bracket outer ends;
- a roller holder arranged on top of the connecting bracket middle part and with a switch blade roller arranged rotatably therein; and
- wherein the rotation shaft of the switch blade roller arranged rotatably in the roller holder is substantially parallel to the longitudinal direction of the connecting bracket and is situated at a higher level than the connecting bracket middle part and directly above the surface of the connecting bracket.

[0008] 'Directly above' is intended to mean that the rotation shaft lies above and within the vertical projection of the edges of the connecting bracket.

[0009] Such a switch blade roller device can be arranged on and removed from sleepers of a turnout with simple means so that the switch blade roller device can be temporarily removed in simple manner for the purpose of rearranging the ballast supporting a turnout. The risk of damage to the switch blade roller device due to this rearrangement is then prevented.

[0010] Because the rotation shaft of the switch blade roller arranged rotatably in the roller holder is substantially parallel to the longitudinal direction of the connecting bracket, this rotation shaft is also substantially parallel to a (switch) rail of the turnout. When the turnout is operated, the switch rail will displace in transverse direction and roll onto the switch blade roller.

[0011] Because the rotation shaft of the switch blade roller is situated directly above the connecting bracket, the switch rail will exert only a limited tilting moment, or no tilting moment, on the connecting bracket of the switch blade roller device. It hereby suffices for the switch blade roller device according to the invention to be arranged with only the two connecting bracket outer ends on or at adjacent sleepers, and one or more additional supporting points adjacently of the connecting bracket are unnecessary.

[0012] The switch blade roller device according to the invention moreover retains its setting relative to the turnout when it is temporarily removed from the turnout for maintenance operations. The connecting bracket with roller holder mounted thereon can be temporarily removed here as a whole from the sleepers, after which the turnout maintenance can take place. In the design according to the invention the setting of the switch blade roller device is therefore only necessary before the first use thereof.

[0013] The switch blade roller device can be assembled in a workshop, after which it has only to be placed and set on site before a first use.

[0014] During an average lifespan of a switch blade roller device of at least 20 years, it will have to be removed several times for maintenance of a turnout. Turnout maintenance typically takes place every 5 to 6 years.

[0015] In addition, the reliability is greater than that of the switch blade roller devices currently applied in the rail network. This increased reliability can be attributed particularly to the smaller number of individual components, as well as the relative simplicity thereof. With the exception of the roller holder, the other components can be manufactured in relatively simple manner. The most precise processes are moreover focussed on one component: the roller holder.

[0016] According to a preferred embodiment, the switch blade roller device comprises a single continuous connecting bracket. This has the advantage that the switch blade roller device is removable in one operation from the sleepers of a turnout while the setting thereof is retained.

[0017] When a switch rail rolls onto the switch blade

roller of the switch blade roller device, the continuous connecting bracket will be pressed several millimetres downward and the switch rail will thereby roll gradually onto the switch blade roller. Peak loads are prevented by the connecting bracket being pressed down in this way.

[0018] According to a further preferred embodiment, the connecting bracket spans a length of at least 370 mm. Because the centre- to- centre distance between two successive sleepers in the Netherlands is about 600-610 mm (and a maximum of about 700 mm), and these sleepers have a width of about 200- 250 mm, a minimum length of at least 370 mm is required to span the distance between two successive sleepers with one single continuous connecting bracket. At a centre- to- centre distance of 600 mm and a sleeper width of 250 mm a connecting bracket length of 370 mm results in both sleepers in a support surface of (370- (600- 250)) / 2 = 10 mm.

[0019] Provided according to yet another preferred embodiment between the connecting bracket outer ends and the connecting bracket middle part are connecting bracket transition parts which provide a distance between the connecting bracket outer ends and the connecting bracket middle part such that the upper side of a mounted switch blade roller, which is arranged rotatably in the roller holder arranged on the connecting bracket middle part, extends some distance above the connecting bracket outer ends. When mounted on a turnout, the switch blade roller is hereby located at a height level at which it lifts the switch rail relative to the slide chair when the switch rail is situated in a rest position remote from the stock rail.

[0020] It is noted that applications can be envisaged in which the underside of a switch rail is located at a position higher than the level of the sleepers such that the application of a switch blade roller with a limited diameter makes connecting bracket transition parts providing a height difference unnecessary.

[0021] According to yet another preferred embodiment, the switch blade roller device comprises setting means which are arranged at a higher level than the connecting bracket middle part and directly above the surface of the connecting bracket, and which are configured to thereby set the position of the switch blade roller relative to the connecting bracket middle part of the connecting bracket. A correct setting is important in guaranteeing safe operation of the turnout.

[0022] According to yet another preferred embodiment, the setting means comprise both a height setting and a transverse setting. The transverse direction is defined here as transversely of the connecting bracket, and so also transversely of the longitudinal direction of the (switch) rail.

[0023] According to yet another preferred embodiment, the roller holder comprises a roller holder base plate and the setting means comprise at least a slot-like recess arranged in the roller holder base plate. This slot-like recess enables sliding of the roller holder relative to the connecting bracket middle part of the connecting bracket. After being slid to a desired position, the connection between the connecting bracket and the roller holder is fixed using fixing means, such as a bolt connection.

[0024] According to yet another preferred embodiment, the roller holder comprises at least two roller holder flange parts extending transversely from the roller holder base plate and having slot-like recesses arranged therein;

- wherein a height-setting part comprises a substantially U-shaped profile part with a rear wall and side walls provided with slot-like recesses, wherein the profile part is configured to be displaceable relative to the roller holder such that the side walls of the profile part are slidable along the roller holder flange parts;
- wherein a shaft on which the switch blade roller is arranged extends through the intersections of the slot-like recesses of the roller holder flange parts and the slot-like recesses of the profile part; and
- wherein the slot-like recesses in the profile part lie at an angle relative to the slot-like recesses arranged in the roller holder flange parts so that the height of the switch blade roller is adjustable via a displacement of the profile part relative to the roller holder. Such a device provides a precise adjustability which is moreover applied uniformly at both outer ends of the shaft on which the switch blade roller is arranged.

[0025] According to yet another preferred embodiment, one or more height-setting parts are arrangeable between the connecting bracket middle part and the roller holder base plate. Arranging one or more height-setting parts makes the height adjustable.

[0026] According to yet another preferred embodiment, the height-setting part comprises a substantially flat sole plate. Such sole plates can be supplied in different thicknesses. It is also possible to envisage a slot extending as far as an edge being provided which makes it possible to slide in the sole plate without full disassembly being necessary.

[0027] According to yet another preferred embodiment, the height-setting part comprises a wedge-shaped sole part. The height is adjustable by sliding the wedge shape, wherein it is advantageous that separate sole plates are unnecessary.

[0028] In a first embodiment the roller holder base plate has a chamfered form co-acting with the wedge-shaped height setting part, although it is alternatively possible to envisage applying two co-acting chamfered height-setting parts.

[0029] The invention further relates to a turnout, comprising:

- at least two sleepers;
- a switch blade roller device according to the invention arranged between two adjacent sleepers,

wherein the connecting bracket outer ends rest on two adjacent sleepers; and

- mounting means for thereby releasably mounting the connecting bracket outer ends on the sleepers.

[0030] According to a preferred embodiment of the turnout, the mounting means comprise a mounting bracket releasably arrangeable on the sleeper.

[0031] Preferred embodiments of the present invention are further elucidated in the following description with reference to the drawing, in which:

Figure 1 is a top view of a turnout with four switch blade roller devices according to the invention;
Figure 2 is an enlarged top view of a switch blade roller device shown in figure 1;
Figure 3 is an enlarged perspective view of the turnout of Figure 1.
Figure 4 is an enlarged perspective view of a switch blade roller device shown in figure 3;
Figure 5 is a perspective detail view of height-setting means of the roller holder of the switch blade roller device shown in Figure 4;
Figure 6 is an exploded perspective view of the switch blade roller device shown in Figure 4;
Figure 7 is a side view of a first situation of the height setting of the embodiment shown in Figures 2-6;
Figure 8 is a side view of a second situation of the height setting of the embodiment shown in Figures 2-6;
Figure 9 is a perspective view of a switch blade roller device according to a second embodiment; and
Figure 10 is a perspective view of a switch blade roller device according to a third embodiment.

[0032] The turnout shown in Figure 1 comprises a stock rail 6 and a switch rail 4, wherein in the rest position shown in Figure 1 switch rail 4 lies some distance from stock rail 6. In this rest position shown in Figure 1 switch rail 4 is supported by a switch blade roller 82 of a switch blade roller device 1. Such switch blade roller devices 1 are arranged at the locations shown with circles in Figure 1.

[0033] The top view of Figure 2 shows how such a switch blade roller device 1 is arranged between two sleepers 10 of a turnout. Switch rail 4 is shown with broken lines in Figure 2 and is in a rest position, wherein switch rail 4 is in a position remote from stock rail 6 and is supported by switch blade roller 82. In an operative position, wherein switch rail 4 would lie against stock rail 6, it would be supported by slide chair 8 of switch blade roller device 1. Switch blade roller 82 is accommodated in a roller holder 44 (Figure 2). This roller holder 44 comprises a roller holder base plate 46 with slot-like recesses 50 therein. Roller holder 44 can be arranged on the connecting bracket middle part 30 of connecting bracket 24 and the position of switch blade roller 82 relative to connecting bracket 24 is adjustable using the slot-like recess 50.

[0034] Connecting bracket 24 comprises connecting bracket outer ends 26 which can be arranged on sleepers 10 and a connecting bracket middle part 30 present between the connecting bracket outer ends 26. The connecting bracket outer ends 26 are arranged releasably on a sleeper 10 using a mounting bracket 12.

[0035] Situated between the connecting bracket outer ends 26 and the connecting bracket middle part 30 are connecting bracket transition parts 28 which ensure that the connecting bracket middle part 30 lies a distance under the connecting bracket outer ends 26 such that there is sufficient overall height for placing a roller holder 44 with switch blade roller 82 arranged therein. In a situation where roller holder 44 is arranged on the connecting bracket middle part 30, switch blade roller 82 extends some distance above the connecting bracket outer ends 26 so that it lifts switch rail 4 off slide chair 8 when switch rail 4 is situated in the rest position remote from stock rail 6. The position of the switch blade roller device between the sleepers protects the switch blade roller device to some extent from weather influences such as snow, rainwater or other fouling.

[0036] Mounting brackets 12 comprise a strip part 14 having therein a receiving part 16 provided with protrusions 18 for receiving a connecting bracket outer end 26 therebetween. Provided on strip part 14 of mounting bracket 12 are fastening tongues 20 with bolt holes 22 arranged therein (Figure 4).

[0037] Setting means are provided to enable setting of switch blade roller 82 at a desired position relative to the connecting bracket middle part 30 of connecting bracket 24.

[0038] In a first preferred embodiment, which is shown in Figure 4, the setting means comprise a combination of a bolt 72, a first locking ring 74, a second locking ring 76 and an elastically deformable clamping ring 78 which can be pressed against a roughened part 58 of a roller holder flange part 48 of roller holder 44. When bolt head 72 is loosened and locking rings 74, 76 and clamping ring 78 come to lie slightly clear of each other, the shaft 80 with switch blade roller 82 arranged rotatably thereon is adjustable in the height in the manner which will be further elucidated below with reference to Figures 7 and 8.

[0039] It is noted that the roller holder base plate 46 of roller holder 44 also comprises a roughened part 56 close to slot-like recess 50. Similarly to the combination of bolt 72, locking rings 74, 76 and clamping ring 78, a bolt 34, first and second locking rings 38, 40 and a clamping ring 42 are provided to thereby enable setting and fixing of the horizontal position of roller holder 44 relative to connecting bracket 24. Bolt 34 protrudes here through the hole 32 drilled in the connecting bracket middle part 30 and engages on the underside thereof on a nut 36.

[0040] Provided according to a first embodiment of the setting means is a height-setting part 64 consisting of a U-shaped profile part 64 with a rear wall 66 and side walls

68 provided with slot-like recesses 70. These side walls 68 of profile part 64 are arranged slidably along roller holder flange parts 48.

[0041] A cover strip 60 is provided if desired on the upper side of roller holder flange parts 48 to prevent a height displacement of the U-shaped profile part 64. Cover strips 60 function here as stop edge for the upper edge of side walls 68 of height-setting part 64.

[0042] The shaft 80 on which switch blade roller 82 is arranged extends through the opening where slot-like recesses 54 of the roller holder flange parts 48 coincide with the slot-like recesses 70 of side walls 68 of profile part 64. Because the slot-like recesses 70 in profile part 64 are lie at an angle relative to slot-like recesses 54 arranged in the roller holder flange parts 48, the height of switch blade roller 82 is adjustable via a displacement of profile part 64 relative to roller holder 44.

[0043] Once the height setting of switch blade roller 82 has been set as desired, this position is fixed by tightening the bolt 72 via locking rings 74, 76 and clamping ring 78. Switch blade roller 82 is arranged rotatably around shaft 80 in roller holder 44 over bearings 84.

[0044] The height setting of switch blade roller 82 is further elucidated in Figures 7 and 8. The shaft 80 on which switch blade roller 82 is rotatably arranged protrudes through the coinciding recess of slot 54 in the roller holder flange part 48 and slot 70 in side wall 68 of height-setting part 64. Because the slot-like recess 70 in profile part 64 is arranged at an angle relative to the slot-like recess 54 present in the roller holder flange part 48, the coinciding opening between the two slot-like recesses 54, 70 shifts in height direction when height-setting part 64 is moved laterally over the roller holder base plate 46 of roller holder 44. In Figure 7 shaft 80 is in a first situation and in Figure 8 this shaft 80 is in a second, raised situation relative to the first situation shown in Figure 7. Because shaft 80 is displaced in height direction, the switch blade roller 82 arranged rotatably around shaft 80 is also displaced in height direction.

[0045] Figures 9 and 10 show alternative embodiments wherein the height setting of roller holder 44 relative to connecting bracket 24 takes place by arranging one or more height-setting parts 164, 264 between the roller holder base plate 46 and the connecting bracket middle part 30. In the embodiment shown in Figure 9 these height-setting parts 164 are flat sole plates, while in the embodiment shown in Figure 10 the height-setting parts 264 have a wedge shape. The wedge-shaped height-setting means 264 co-act with a wedge-shaped underside of the roller holder base plate 46 of roller holder 44 or with a second wedge-shaped height-setting part (not shown) placeable between a flat roller holder base plate 46 and the wedge-shaped height-setting part 264 shown in Figure 10.

[0046] Provided in Figure 9 is a slot-like recess through which shaft 80 fits and in which it is supported. A locking ring 92 clamped with nut 86 prevents the shaft 80 with switch blade roller 82 being able to displace upward out of slot-like recess 154 in the mounted state.

[0047] In the alternative embodiment shown in Figure 10, roller holder 80 is arranged in a slot-like recess 254, after which it can be locked with a locking pin (not shown) through locking recesses 90.

[0048] Although they show preferred embodiments of the invention, the above described embodiments are intended solely for the purpose of illustrating the present invention and not to limit the scope of the invention in any way. It is particularly noted that the skilled person can combine technical measures of the different embodiments, such as a wedge-shaped sole plate 264 combined with the slot-like recess 154 shown in Figure 9. The rights described are defined by the following claims, within the scope of which many modifications can be envisaged.

Claims

1. Switch blade roller device, comprising:

   - a connecting bracket (24) arrangeable between two sleepers (10) of a turnout and comprising connecting bracket outer ends (26) arrangeable on or at the sleepers, and a connecting bracket middle part (30) present between the connecting bracket outer ends (26);

   characterized by

   - a roller holder (44) arranged on top of the connecting bracket middle part with a switch blade roller (82) arranged rotatably therein; and
   - wherein the rotation shaft of the switch blade roller (82) arranged rotatably in the roller holder is substantially parallel to the longitudinal direction of the connecting bracket (24) and is situated at a higher level than the connecting bracket middle part (30) and directly above the surface of the connecting bracket (24).

2. Switch blade roller device as claimed in claim 1, comprising a single continuous connecting bracket (24).

3. Switch blade roller device as claimed in claim 1 or 2, wherein the connecting bracket (24) spans a length of at least 370 mm.

4. Switch blade roller device as claimed in any of the foregoing claims, wherein between the connecting bracket outer ends (26) and the connecting bracket middle part (30) are provided connecting bracket transition parts (28) which provide a distance between the connecting bracket outer ends (26) and the connecting bracket middle part (30) such that the upper side of a mounted switch blade roller, which is arranged rotatably in the roller holder arranged on the connecting bracket middle part, extends some distance above the connecting bracket outer ends.

5. Switch blade roller device as claimed in any of the foregoing claims, comprising setting means which are arranged at a higher level than the connecting bracket middle part and directly above the surface of the connecting bracket, and which are configured to thereby set the position of the switch blade roller (82) relative to the connecting bracket middle part (30) of the connecting bracket (24).

6. Switch blade roller device as claimed in claim 5, wherein the setting means comprise both a height setting and a transverse setting.

7. Switch blade roller device as claimed in claim 6, wherein the roller holder (44) comprises a roller holder base plate (46) and the setting means comprise at least a slot-like recess (50) arranged in the roller holder base plate (46).

8. Switch blade roller device as claimed in any of the foregoing claims, wherein the roller holder (44) comprises at least two roller holder flange parts (48) extending transversely from a roller holder base plate (46) and having slot-like recesses (54) arranged therein;

- wherein a height-setting part (64) comprises a substantially U-shaped profile part (64) with a rear wall (66) and side walls (68) provided with slot-like recesses (70), wherein the profile part (64) is configured to be displaceable relative to the roller holder (44) such that the side walls (68) of the profile part (64) are slidable along the roller holder flange parts (48);
- wherein a shaft (80) on which the switch blade roller (82) is arranged extends through the intersections of the slot-like recesses (54) of the roller holder flange parts (48) and the slot-like recesses (70) of the profile part (64); and
- wherein the slot-like recesses (70) in the profile part (64) lie at an angle relative to the slot-like recesses (54) arranged in the roller holder flange parts (48) so that the height of the switch blade roller (82) is adjustable via a displacement of the profile part (64) relative to the roller holder (44).

9. Switch blade roller device as claimed in any of the foregoing claims, wherein one or more height-setting parts (164, 264) are arrangeable between the connecting bracket middle part (30) and the roller holder base plate (46).

10. Switch blade roller device as claimed in claim 9, wherein the height-setting part comprises a substantially flat sole plate (164).

11. Switch blade roller device as claimed in claim 9, wherein the height-setting part comprises a wedge-shaped sole part (264).

12. Turnout, comprising:

- at least two sleepers (10);
- a switch blade roller device as claimed in any of the foregoing claims 1-11 arranged between two adjacent sleepers, wherein the connecting bracket outer ends (26) rest on two adjacent sleepers; and
- mounting means for thereby releasably mounting the connecting bracket outer ends on the sleepers.

13. Turnout as claimed in claim 12, wherein the mounting means comprise a mounting bracket (12) releasably arrangeable on the sleeper.

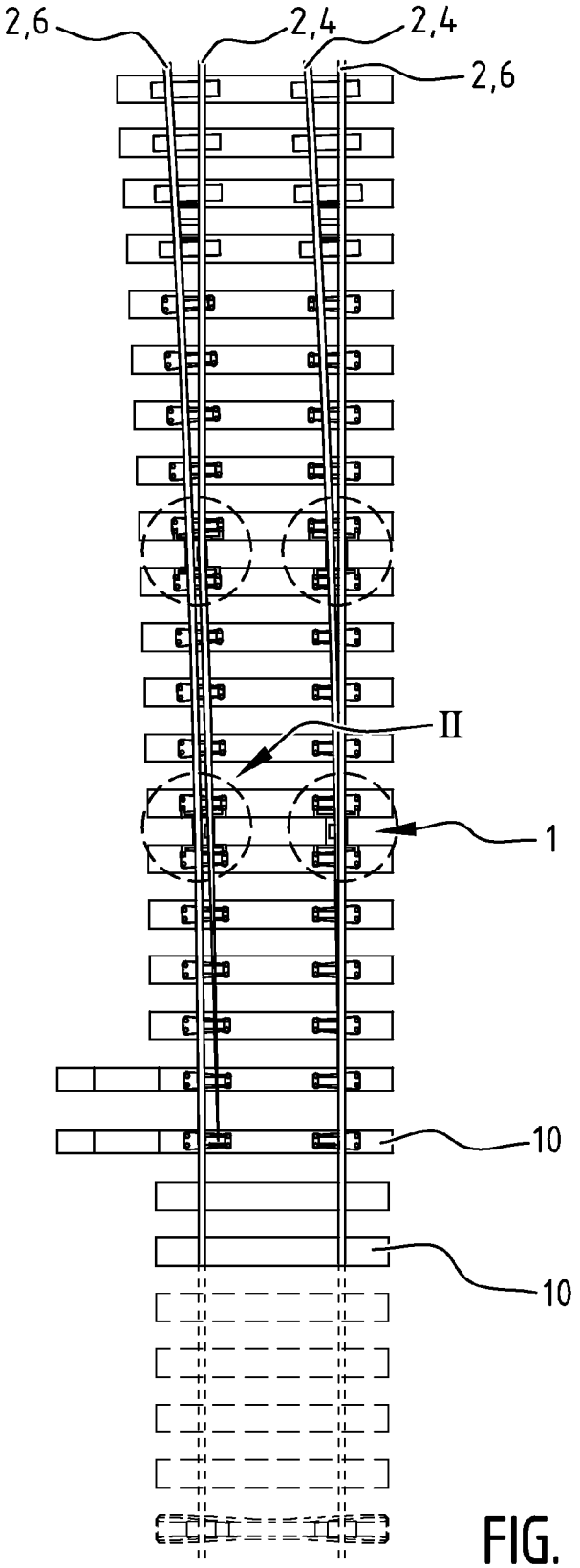

FIG. 1

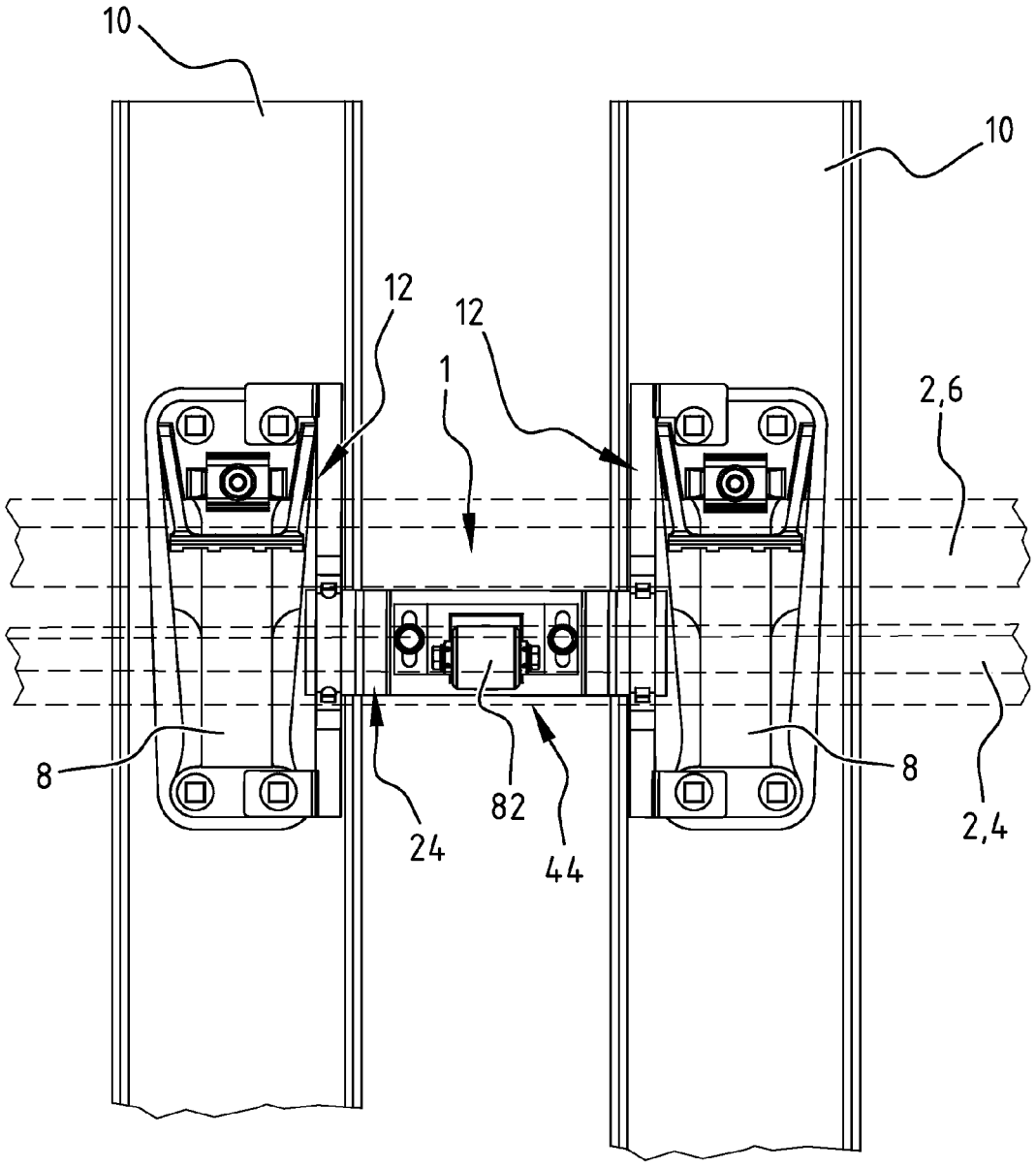

FIG. 2

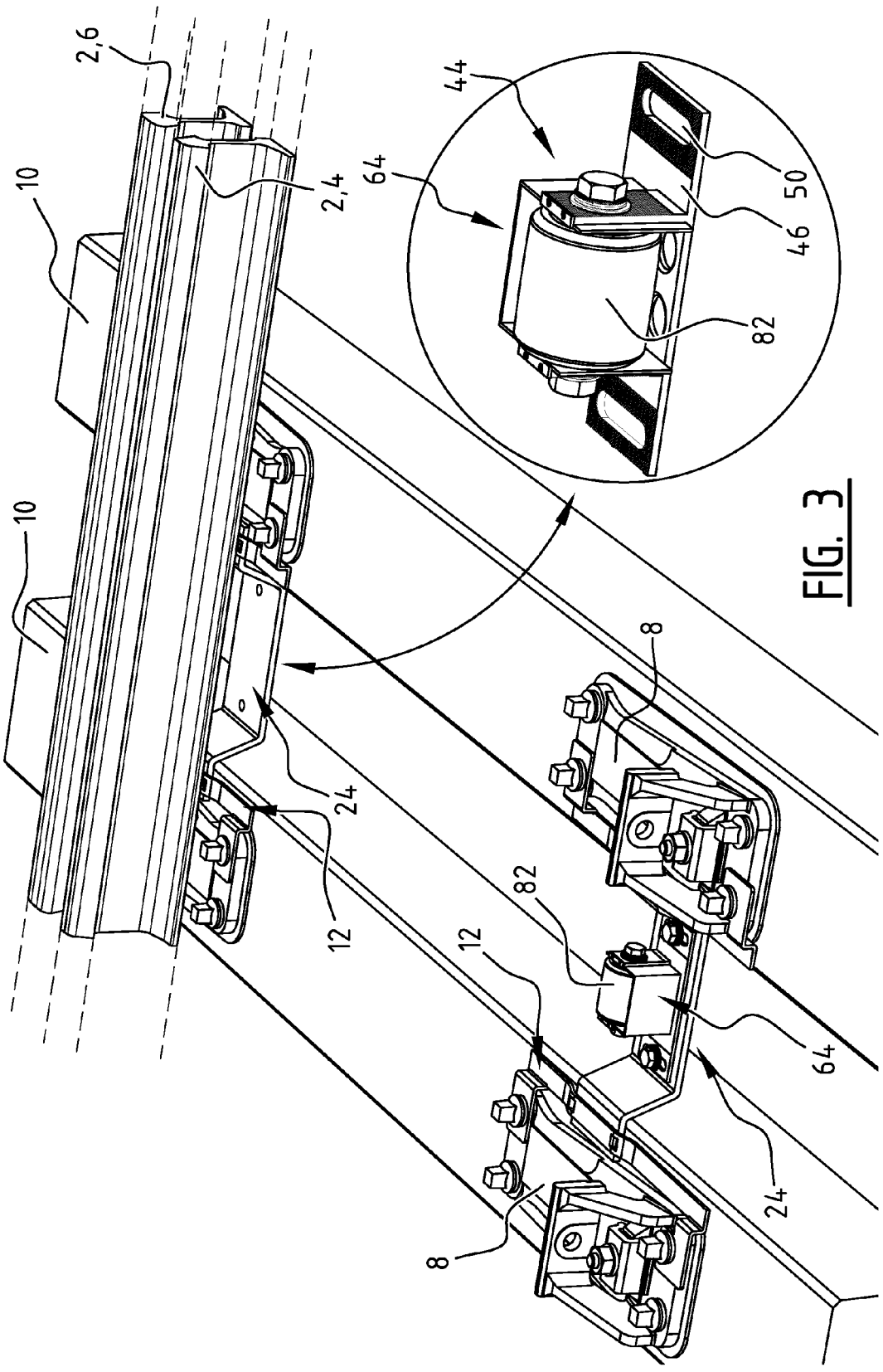

FIG. 3

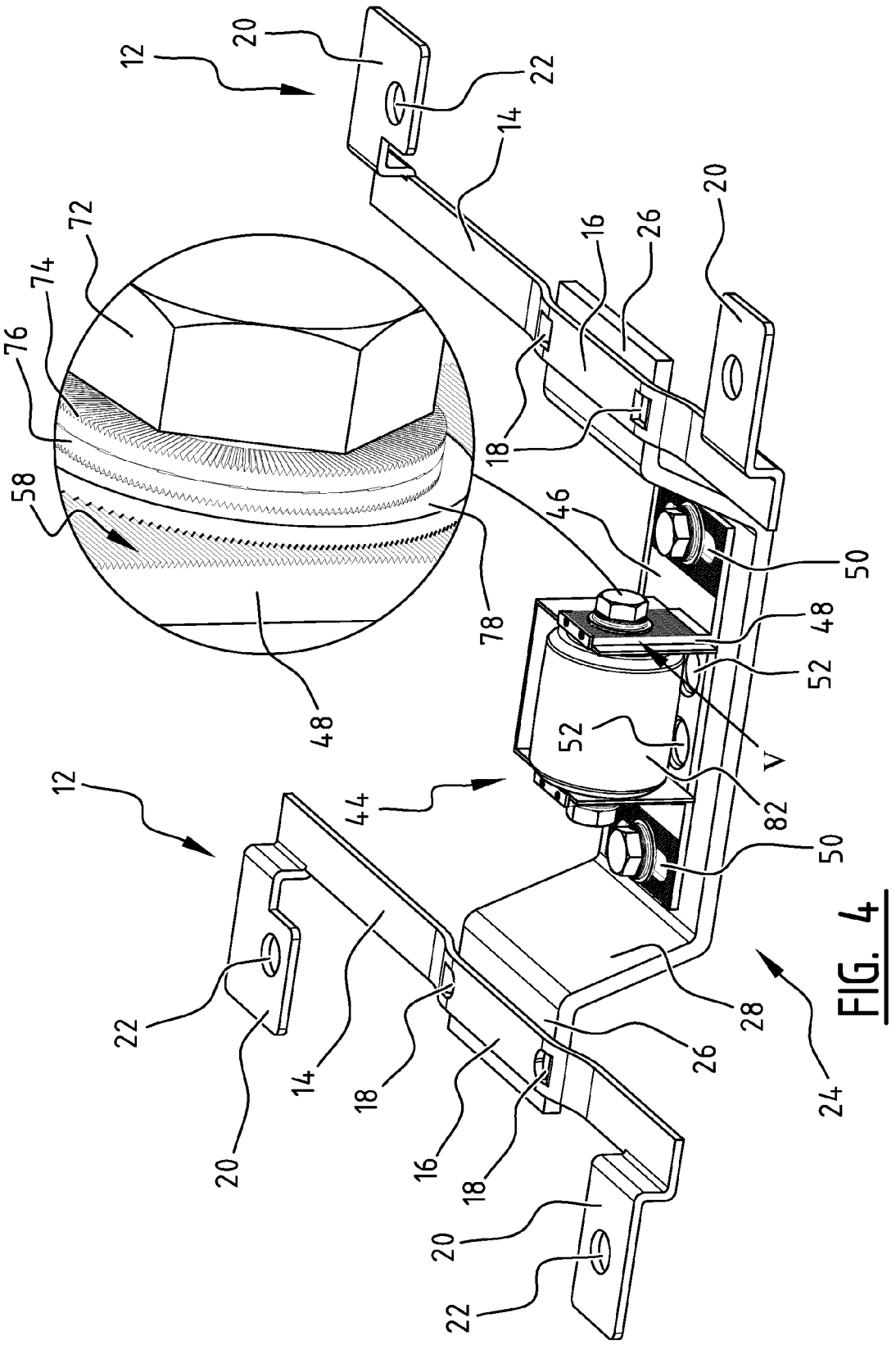
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FIG. 4

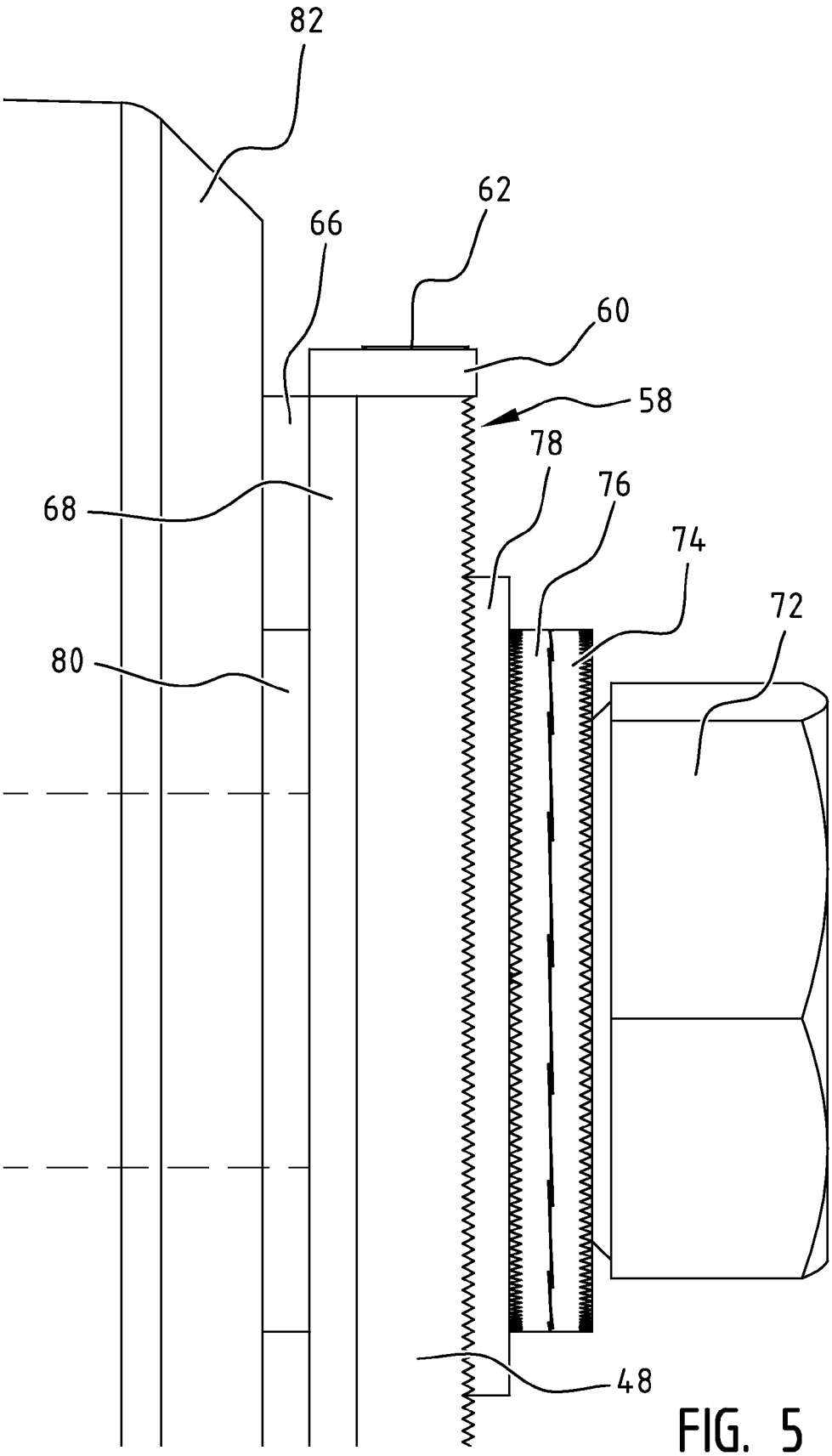

FIG. 5

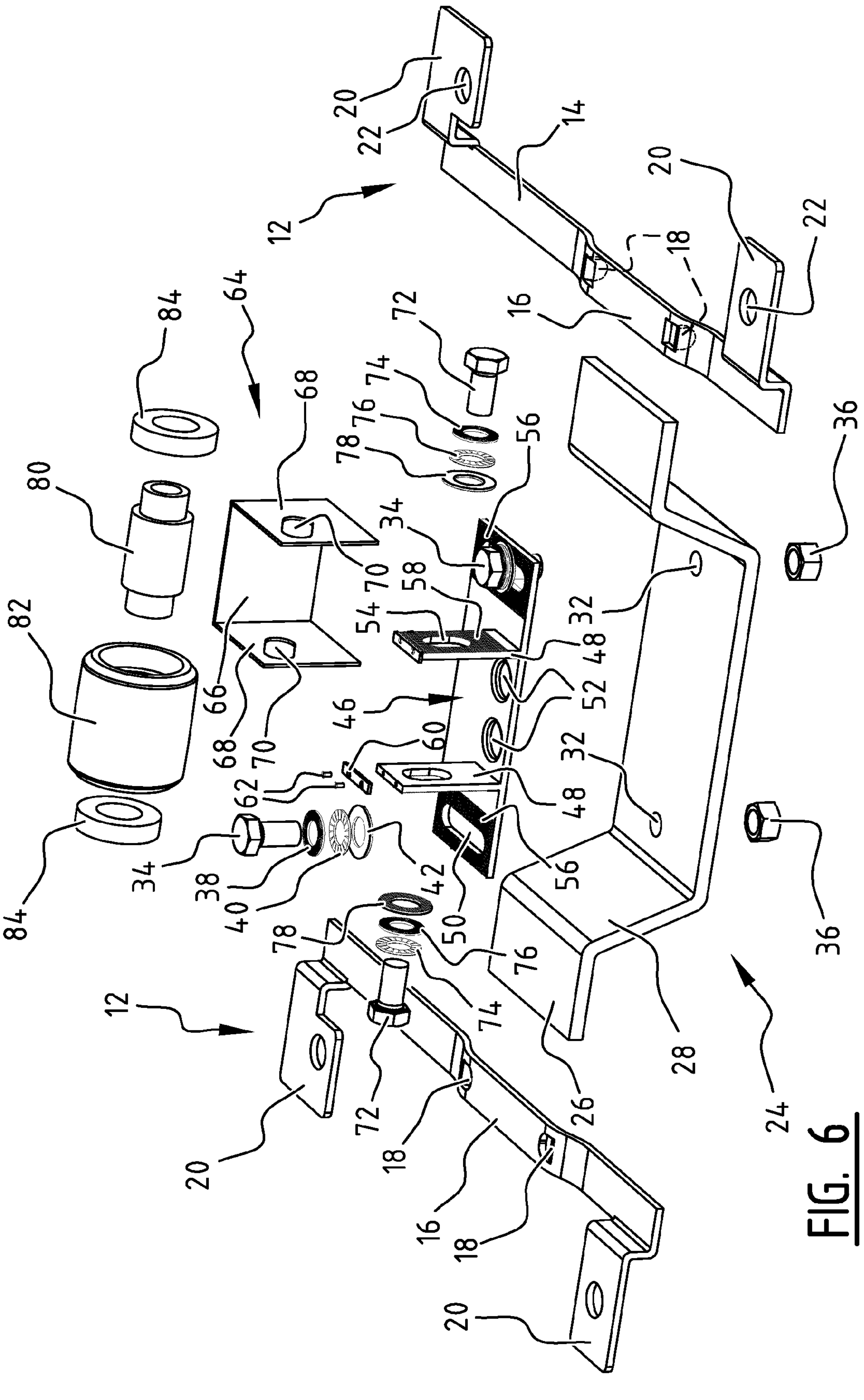
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FIG. 6

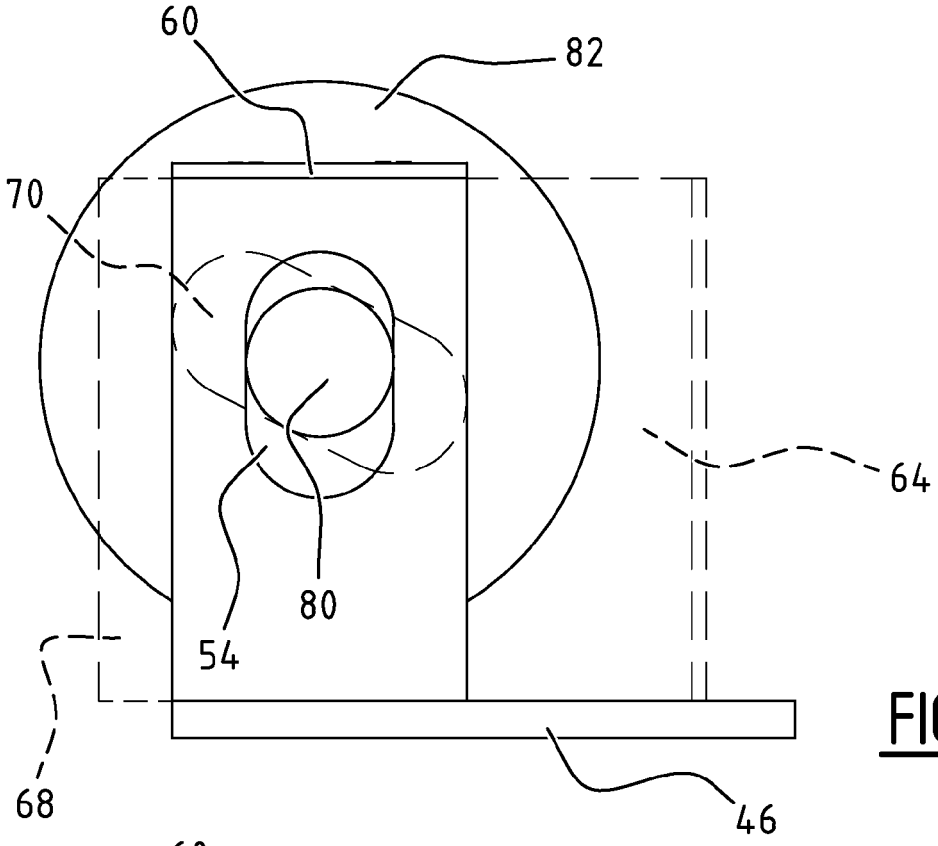

FIG. 7

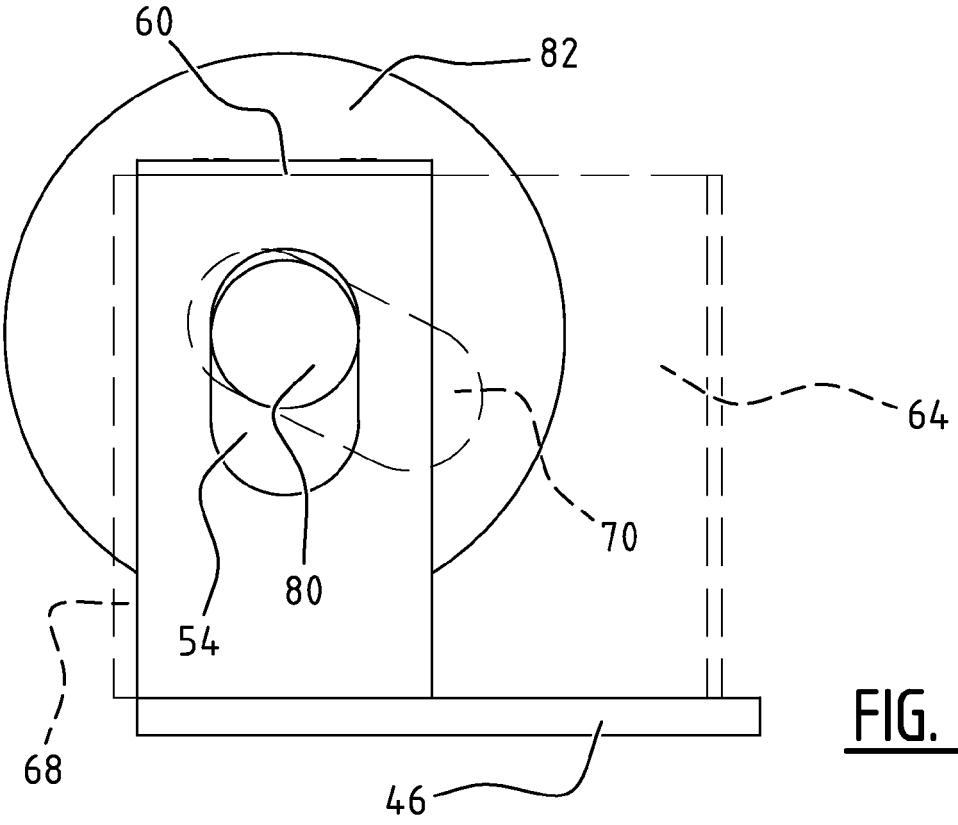

FIG. 8

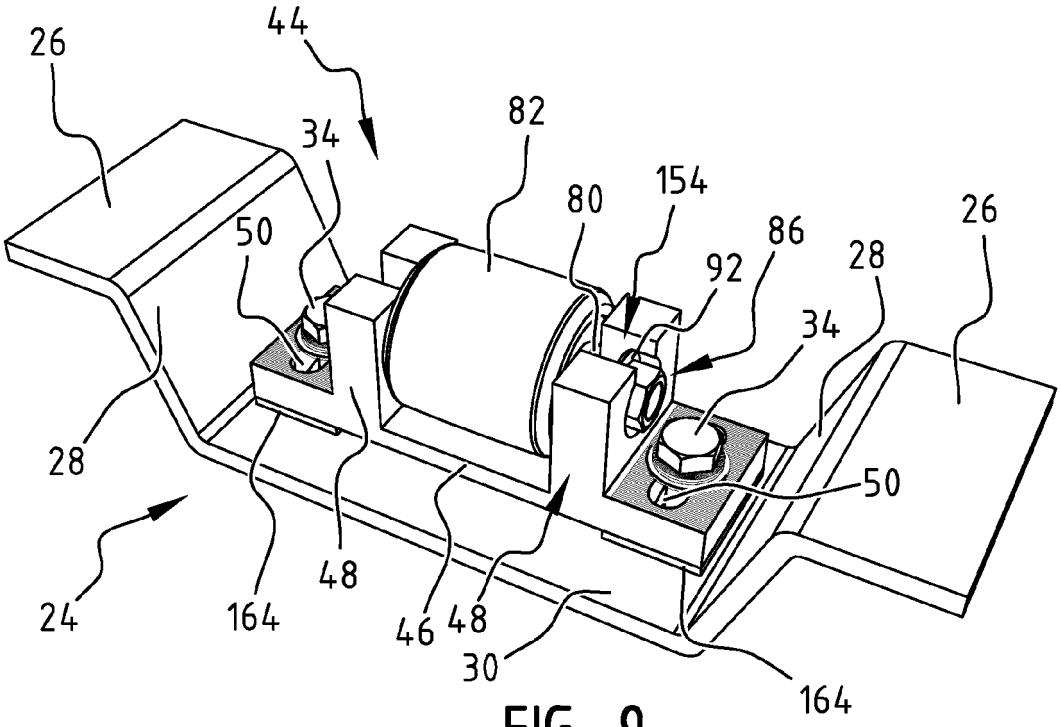
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FIG. 9

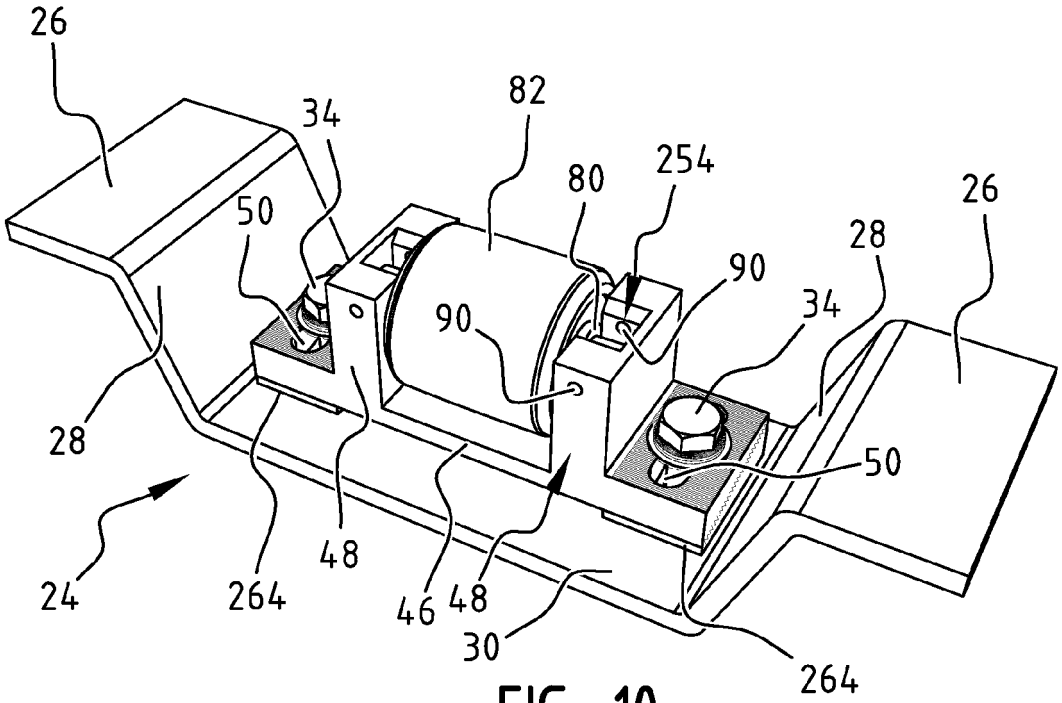
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FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 13 16 3953

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 299 13 898 U1 (COMPANHIA VALE DO RIO DOCE MIN [BR]) 21 September 2000 (2000-09-21) * page 3, last paragraph - page 5, paragraph 4; figures * -----	1,12	INV. E01B7/02
A	AT 375 697 B (MAURER GERHARD [AT]) 27 August 1984 (1984-08-27) * the whole document * -----	1,12	
A	DE 93 17 723 U1 (ENZESFELD CARO METALLWERKE AG [AT]) 20 January 1994 (1994-01-20) * the whole document * -----	1,12	
			TECHNICAL FIELDS SEARCHED (IPC) E01B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 July 2013	Movadat, Robin

CATEGORY OF CITED DOCUMENTS

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1

EPO FORM 1503 03.82 (P04C01)

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01-07-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29913898 U1	21-09-2000	AU 3407200 A	16-11-2000
		BR 7900846 U	16-01-2001
		CA 2279753 A1	14-11-2000
		DE 29913898 U1	21-09-2000
		FR 2793500 A3	17-11-2000
		GB 2349905 A	15-11-2000
		IT RM990218 U1	23-04-2001
		US 6189840 B1	20-02-2001
AT 375697 B	27-08-1984	NONE	
DE 9317723 U1	20-01-1994	AT 171745 T	15-10-1998
		CA 2136259 A1	20-05-1995
		DE 9317723 U1	20-01-1994
		DK 654561 T3	21-06-1999
		EP 0654561 A1	24-05-1995
		ES 2123747 T3	16-01-1999
		FI 945396 A	20-05-1995
		HU 737 U	28-02-1996
		NO 944401 A	22-05-1995
		PL 305883 A1	29-05-1995
		US 5509626 A	23-04-1996

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82