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(54) **AN INNOVATIVE ELASTIC BEARING FOR RAILWAY SWITCHES, PREFERABLY OF THE
SELF-LUBRICATING TYPE**

INNOVATIVES ELASTISCHES LAGER FÜR EISENBAHNWEICHEN, VORZUGSWEISE VOM
SELBSTSCHMIERENDEN TYP

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EP 3 945 156 B1

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Description

Scope of the invention

[0001] The present invention relates to the technical field concerning railway technology, in particular the technical elements assigned to the implementation of a railway switch.

[0002] More particularly, the invention relates to an innovative bearing for needle sliding support, that is particularly simple and functional.

Overview of the prior art

[0003] Railway switches, or points, have been known for a long time. They are designed to enable the train to change its course from one track running along one direction to another track that deviates from that direction.

[0004] Generally the structural elements include a needle, a counter-needle and a metal support plate for these needles and counter-needles. The counter-needle is attached to this metal support which forms a supporting and sliding surface on which the needle moves and which can be moved away from and in the direction of the fixed counter-needle. The movement of the needle away from/in the direction of the counter-needle changes the path of the train by directing it in specific directions according to its position. The needle is moved through actuators.

[0005] The metal plate can be structured in various more or less complex ways and can include lubrication systems to facilitate sliding of the needle, and rolling elements.

[0006] Generally speaking, the term bearing is used to refer to the assembly consisting of: metal support plate for attachment of the counter-needle, which also acts as sliding surface for the needle; devices for locking the counter-needle with respect to the above-mentioned metal plate; preferably potential devices to facilitate sliding of the needle on the metal support plate.

[0007] Figures 1 to 3, for clarification purposes, constructively show an example of a commercially available Schwing 60C28U brand bearing in complete kit form which includes the elastic attachment system for the counter-needle and the system that eliminates lubrication for the needle.

[0008] Figure 4 shows an assembly sequence of this bearing assembly.

[0009] In particular, figure 1 shows this metal plate 1 which forms a flat sliding surface 2 on which the needle 10 moves with respect to the counter-needle 20 (see also Figure 2). The counter-needle is attached to plate 1 and for this purpose plate 1 forms a receiving seat 3 for positioning of the counter-needle 20. The plate, in this particular solution, includes rollers 30 (Figure 2 shows only one) which facilitate sliding of the needle on surface 2 towards and away from the counter-needle, considerably reducing friction and therefore eliminating the need for

lubrication.

[0010] Obviously there are similar solutions in which, in fact, there are no such rolling elements which are replaced by a simple lubrication.

[0011] As shown in the assembly of Figure 3, again of the prior art, it can be seen that the counter-needle must obviously be attached to this bearing. For this purpose, the prior art includes fastenings with elastic elements. As can be seen from figure 3, on one side an elastic crampon 50 is used which creates a constraint on the base of the counter-needle while on the opposite side a "staple spring" 60 (known as an AT 200 type spring in the technical jargon) is used, inserted in a special seat created in the body of the metal support plate. This spring, as shown in the cross-section of figure 4 - *phase A*, has a hairpin shape (generally U-shaped or bow-shaped) and is inserted into a seat of the bearing so that one of its ends rests on the base of the counter-needle. A fulcrum is provided between the end of the spring which rests on the base of the counter needle and the opposite end of the spring which, as described immediately below, is raised with a special tool to set it into operation (i.e. in a load condition in which it exerts locking pressure on the counter-needle). A fulcrum is obtained as a tooth or a protrusion generally inside the seat.

[0012] With a special lever, the two ends (the legs of the U) are raised to come into position on a special step so that the spring flexes around the fulcrum thus exerting a locking pressure on the base of the counter-needle (see phase B of figure 4). In this condition the spring is in operation.

[0013] That said, it is clear that the prior art solution is not free from various technical drawbacks.

[0014] In particular, loading of the spring in operation is difficult, involving a not easy operation in which, through a special dedicated lever, the operator has to elastically flex two ends which must then be positioned carefully on appropriate steps.

[0015] This also reveals a further technical problem linked to complexity of manufacturing the seat in the bearing into which this spring is to be inserted. This seat must be precisely machined to exactly match the steps on which the ends of the spring rest when it is flexed. If this machining is not carried out with precision, it will be impossible to correctly position the spring or its locking efficiency may be compromised. It is clear that an unsafe locking may seriously compromise the running safety of the train.

[0016] Then there is the release or unloading operation, which is just as laborious and complex as the operator must act with the same external lever with which he has put the spring into operation to remove the ends of the staple spring from the steps.

[0017] Also known is the solution described in European publication EP3473519 in the name of the same applicant.

[0018] This solution describes a flexible locking element also in the form of a flexible metal sheet which is

put in a load condition through the rotation of an eccentric pin.

[0019] Figure 5 shows very well, in cross-section, the eccentric pin (**PC**) which, thanks to its eccentricity, raises the tail of the spring (**CO**) putting it in a load condition such that the front (**PA**) of the spring exerts a pressure force on the base (**B**) of the rail, locking it in position.

[0020] This solution is certainly simpler and more functional than the previous one, since all that is required to put it into operation is the rotation of a pin with a special tool, thus resulting in a considerably simpler solution.

[0021] However, even this solution is not free from technical drawbacks. In particular, constructively, it includes many separate parts, such as the coating of the channel for passage of the pin, production of the eccentric pin, production of the elastic sheet, etc.

[0022] Furthermore, accurate machining is required of the eccentric back of the pin, which in turn needs leveling in order to ensure a good stable support surface that prevents accidental rotation of the pin.

[0023] It is clear that the part in question is subject to multiple stresses and vibrations so that, under such conditions, the risk of accidental rotation of the pin, possibly caused by wear of the surfaces, may increase, implying significant safety risks.

[0024] A bearing for railway switches according to the preamble of independent claim 1 is disclosed in JP 2018 003498 A.

Summary of the invention

[0025] It is therefore an object of the present invention to provide a switch bearing which solves the above-mentioned technical drawbacks.

[0026] In particular, it is an object of the present invention to provide a bearing, preferably self-lubricating, for a switch which is effective, easy to install, constructively simple and furthermore, safe.

[0027] These and other objects are thus achieved with this bearing for railway switches, in compliance with claim 1.

[0028] This bearing (1) for railway switches includes:

- A support (2, 3) comprising a rear part (2) having a seat (5) and a front part (3) on which to mount a rail (20) to be locked;
- A locking assembly (600, 700, 720) to enable said rail (20) to be attached to said front part (3), said locking assembly comprising a flexible element (600) having a front part (602) and a rear part (601), wherein the flexible element (600) can be inserted by sliding inside said seat (5) until it reaches a locking position in which said front part (602) of the flexible element is facing said front part (3) of the support so that said front end (602) of the flexible element overlaps, in use, a part of said rail located in said front part (3) of the support component to exert a locking pressure thereon;

[0029] According to the invention it further includes:

- A locking wedge (700);
- A sliding guide (721) through which said locking wedge (700) is guided along an insertion/removal path;
- Said sliding guide being obtained in a position such as to guide the locking wedge (700) below the rear part (601) of the locking element (600) into a restraint position in which, following sliding of said locking wedge (700) under said rear part (601), the wedge raises and/or keeps said rear part (601) raised causing a flexing of the flexible element and thus generating a locking pressure which said front part (602) of the flexible element exerts on the part of the rail to be locked.
- wherein the length of the flexible element is such that, in said locking position, its rear part (601) protrudes at least partially from the seat (5), said sliding guide (721) positioning itself below said exceeding part so that the locking wedge acts on said rear part outside the seat (5) 1
- wherein said sliding guide (720) is arranged transversely with respect to the longitudinal direction of the seat (5).

[0030] In this way all the above-mentioned technical drawbacks are easily solved.

[0031] In particular, the construction solution is now very simple, includes few parts and is safe.

[0032] The insertion of the wedge is a simple operation and its adequate conformation makes it very stable.

[0033] Advantageously, the seat (5) may include at least one rotating fulcrum (5') inside it so that the flexing of the flexible element takes place around said rotating fulcrum.

[0034] Generally the rotating fulcrum can be in the form of a protrusion rising from the upper wall of said seat.

[0035] Advantageously, said locking wedge (700) includes a safety area (705, 706) delimited by one or more walls arranged in such a way that, when the rear part (601) of the flexible element is inserted in said safety area (705, 706) following insertion of the locking wedge under said rear part (601) of the flexible element, said walls prevent the locking wedge from sliding towards the removal direction.

[0036] This makes positioning much safer against accidental ejection, e.g. as a result of continuous vibration.

[0037] Advantageously, said safety area (705, 706) may for example, be in the form of a seat dug in the thickness of the locking wedge on the part of the back which in use faces the overlying flexible element.

[0038] Advantageously, said seat (705, 706) can for example, have a plan shape which follows the shape of the part of the flexible element which is intended to be inserted in said seat.

[0039] Advantageously, said locking wedge may comprise a front portion having a bevel (701) which forms a

chamfer to ease the insertion.

[0040] Advantageously, the locking wedge can have a rear part (703) enlarged in such a way as to form a striking surface on which for example, a hammer may be used for insertion.

[0041] Advantageously, said guide (720) can be delimited by two opposite facing walls spaced apart from each other.

[0042] For example, advantageously, the said walls that delimit the said guide may include a first wall (721) which rises orthogonally from a surface of the said support (1) and a second wall which at least partially delimits the entrance to the seat (5).

[0043] Advantageously, inside the seat (5) a protrusion (90) can be arranged to form an invitation to facilitate the arrangement of the front part (602) of the flexible element above the base of the rail.

[0044] Advantageously, said locking wedge and said flexible element are configured in such a way that when the locking wedge is placed under the flexible element causing it to flex, the locking wedge is prevented from sliding in a direction of removal from underneath the flexible element.

[0045] Advantageously, the flexible element can be in the form of a flexible sheet.

[0046] A method for locking a rail (20) to a bearing (1) for railway switches is also described here, the method is as defined in independent claim 12.

[0047] Advantageously, the loading operation includes raising with a lever (250) of the rear part (601) of the flexible element so as to inflect it, the subsequent insertion along the sliding guide of the locking wedge below the rear of the flexible element and the subsequent release of the lever (250) so that the flexible element is maintained in said flexed position through said locking wedge.

Brief description of the drawings

[0048] Further characteristics and advantages of the bearing, according to the invention, will be clarified with the description that follows of some of its embodiments, provided by way of non-limiting example, with reference to the attached drawings, where:

- Figures 1 to 4 show a first solution according to the prior art;
- Figure 5 shows a further solution according to the prior art;
- Figure 6 shows a section according to the present invention;
- Figure 7 shows an axonometric view of the lifting wedge 700 alone, which is engaged under the tail of the elastic spring to put it under load conditions;
- Figure 8 shows an axonometric view of the load spring alone, in the form of a sheet, preferably metallic.
- Figures 9 to 10 show an assembly sequence while

figure 11 shows a disassembly sequence.

Description of some of the preferred embodiments

[0049] According to figure 6, therefore, a solution in accordance with the invention is shown; also shown, in cross-section, is the wedge 700 which serves to raise and tension (causing it to bend) the spring 600, locking it on rail 20.

[0050] The bearing is substantially the same as that presented of the prior art, so that like parts will be numbered with the same numbering.

[0051] Also in this case, the term bearing means an assembly formed by:

- Metal support plate 1 intended for attachment of the counter-needle 20 and which also serves as a sliding surface 2 for the needle 10;
- Device for locking of the counter-needle with respect to the above-mentioned metal plate.

[0052] There may also be included devices to facilitate sliding of the needle on the metal support plate.

[0053] With reference, therefore, to figure 6 and figure 9, the support plate 1 is provided, generally metallic, which forms at the rear a flat sliding surface 2 on which the needle 10 can move (not shown in figures 9 and 6) with respect to the counter-needle 20 which is locked under a portion of the surface formed by the sliding surface 2. The counter-needle 20 is attached to the said plate 1 and, for this purpose, the plate 1 forms a receiving seat 3 for positioning of the counter-needle 20, which is then locked with the system described below.

[0054] The part below the flat sliding surface forms a sliding channel 5 into which the locking spring is inserted.

[0055] This spring is generally in the form of a flexible metal sheet, preferably steel, which is inserted in the above-mentioned channel.

[0056] The channel, as seen in section, has a rear and front opening in such a way that on one side it is possible to insert the sheet which protrudes partly both at the front, for locking, and at the rear for loading.

[0057] A transversal guide 720 is therefore present, which guides the insertion of a wedge under the spring, avoiding the wedge going out of direction both during the insertion phase, to operate the locking that we will describe below, and during the release phase.

[0058] This guide (also shown in Figure 10) is formed by two opposite facing walls.

[0059] Preferably, on the one hand, there are two non-continuous walls 721 which rise up from the base surface and thus form a sliding corridor being placed at a certain distance in front of the side walls which delimit part of the entrance to the channel 5. Therefore the width of the above-mentioned corridor, or guide, is such as to allow the wedge to slide inside without too much play.

[0060] The matter will be taken up again immediately hereafter.

[0061] The support structure 1, i.e. the plate 1, forms, as said, channel 5 under the sliding surface 2, exactly as in the prior art, and a rotating fulcrum 5' is provided inside said channel 5.

[0062] It is the spring 600 that exerts the locking; it is shown, for greater clarity, in Figure 8.

[0063] It is in the form of a sheet of predetermined thickness, generally and preferably of steel.

[0064] It has a tail 601 which is raised by a special tool and it is the front part 602, preferably beveled, that is used to act on the back of the base of the rail to lock it.

[0065] The front part 602 is beveled both on the back and on the belly of the sheet so that this front part 602 takes overall a pointed shape or, in section, a more or less triangular shape with the top cut.

[0066] The bevel 602' on the back of the sheet is used during insertion to better overcome the protrusion 5' obtained in the insertion channel 5 of the bearing (see also figure 9) and prevent it from going against it and locking during insertion.

[0067] The bevel on the belly 602" is used to form a chamfer that helps this tip to overcome the back of the base of the rail that it has to lock.

[0068] Also as shown in figure 6, component 90 is a beveled protuberance (a sort of springboard) that favors the sliding of bevel 602" in order to raise it and make it overcome the base of the rail on which it must rest.

[0069] Figure 6 also shows, in section, the wall 721 which delimits the corridor for inserting the locking wedge 700 to the right.

[0070] Figure 7 shows an axonometric view of the locking wedge 700 which is used to tension the spring by locking it in position.

[0071] The wedge provides a beveled front 701 which creates a chamfer which favors its positioning and subsequent sliding under the tail of the spring 600, as explained below.

[0072] More particularly, the locking wedge has a rear part 703 which forms an enlarged flat stop area 710 which can therefore be struck by a striking mass, for example, a hammer, in order to push the wedge to the locking position under spring 600.

[0073] Its whole back 704 ends with the inclined part 701 which forms the bevel such that this bevel acts as a wedge which gradually raises the spring until it reaches the part 704 with a constant section where the wedge keeps the spring in the flexed locking position.

[0074] A seat (705, 706) is preferably obtained by removing material from this part of constant section.

[0075] The seat follows the plan shape of a spring part (i.e. the plate) which goes into place within this seat, thus ensuring a snap-lock position.

[0076] Preferably, this seat has an overall T-shape and includes a portion 705 whose shape follows the lateral perimeter of the spring before the tail while it is on the narrow part 706 that the tail 601, which is narrower than the remaining part, is laid.

[0077] Obviously an alternative solution may include

one or more walls that rise from the back of the wedge in such a way that when the sheet passes over these walls, it fits elastically into the seat delimited by them and is thus prevented from sliding away, at least in the direction of the release motion of the wedge from the sheet.

[0078] Such a locking area of the wedge under the sheet is not essential for the invention since the system would work equally well even without it.

[0079] However its presence is important as it provides additional safety against accidental sliding of the wedge towards the release position, which would cause the rail to be released. Thanks to this seat, in fact, the sheet (or spring) is engaged in the seat thus locking the wedge in position.

[0080] In use, therefore, the system works as follows: As shown in Figure 9 (see direction of arrow), the elastic spring 600 is inserted inside the seat 5 of the support structure 1 where, on the opposite side, the rail 20 to be locked is arranged, as already described in the prior art.

[0081] The spring chamfer 602 favors the correct positioning of the spring so that this bias 602 forms an inclined plane 602" which is positioned above the back of the rail base to be locked (basically, the sequence of figures 9 and 10) and which allows the fulcrum 5' located on the roof of the sliding seat 5 (back 602') to be overcome during insertion.

[0082] At this point, however, the spring has to be tensioned, therefore loaded.

[0083] This is preferably done in the following way: By means of a lever 250 (for example, a crowbar) the tail 601 of the spring is raised and with this action, in fact, the spring is at least partially loaded.

[0084] As in fact shown in Figure 6, the protrusion 5' forms a rotating fulcrum thus creating a lever which causes the sheet 600 to bend and therefore brings the front part of the spring 602 to press on the base of the rail placed under said front part.

[0085] The protrusion, although advantageous, is not essential since the upper edge of the seat at the rear opening (the part from where the tail protrudes) can act itself as a rotating fulcrum, while still allowing the plate to be tensioned.

[0086] At this point, however, it is necessary to lock the spring in the load position, with a lock that is preferably safe and does not come out of position over time due to vibration.

[0087] For this purpose, it is here that the locking wedge 700 comes into play, being positioned under the tail 601 as shown by the arrow in Figure 10 while the tail is kept raised via the crowbar 250.

[0088] Obviously the lifting action with the crowbar may only be partial and sufficient to have the tip of the wedge enter under the tail 601, then making an insertion thanks to the help of a striking mass (for example, a hammer) that strikes the area 703 of the wedge.

[0089] The guide, delimited by the 721 and by the entrance wall to the channel 5 on the opposite side, helps to keep the wedge in its position during its translation

under the tail up to the locking position, in which it snaps into place. The guide also avoids lateral movements, even after locking, thereby ensuring an important lateral locking.

[0090] Snap-locking occurs in the case of a wedge with a back provided with a seat (705, 706), thanks to said seat (705, 706) made in the back of the wedge. In fact, during insertion, the tail is raised by the greater thickness of the wedge until it intercepts and falls completely into this seat (a recess of one millimeter or less), therefore snapping into place.

[0091] The same happens if the seat is made with walls rising from the surface of the back of the wedge.

[0092] Therefore once the tip 701 of the wedge has been positioned under the tail of the sheet, it is pushed by a striking mass along its path until the seat (705, 706) comes into the corresponding position under the tail so that a part of the spring, including a portion of the tail, fits correctly into the snap-in seat and locks into that seat.

[0093] During the push and penetration, it is therefore possible to slightly release the lever action of the crowbar since the spring is already raised by the wedge and it will be sufficient to push the wedge at the bottom until the part of the spring that includes a tail portion will settle correctly in the above-mentioned seat with an elastic snap.

[0094] This seat is important, although not essential, as it avoids any accidental sliding, due possibly to vibration, which can cause a release of the wedge.

[0095] Precisely thanks to this seat, the release, as shown in figure 11, again requires the crowbar which will have to lift the tail 601 of the sheet to allow extraction of the locking wedge from under the sheet.

[0096] Alternatively, if desired, insertion of the wedge may be carried out by totally lifting the tail with the crowbar so as to have a facilitated entry of the wedge that does not require strong impulses of the striking mass.

[0097] In this description, the flexible element 600 has thus the function of a locking element and, accordingly, it can also be called as locking flexible element.

Claims

1. A bearing (1) for railway switches comprising:

- A support (2, 3) comprising a rear part (2) having a seat (5) and a front part (3) on which to mount a rail (20) to be locked;

- A locking assembly (600, 700, 720) to enable said rail (20) to be attached to said front part (3), said locking assembly comprising a flexible element (600) having a front part (602) and a rear part (601), wherein the flexible element (600) being insertable inside said seat (5) until a locking position is reached in which said front part (602) of the flexible element is facing said front part (3) of said support so that said front end

(602) of the flexible element overlaps, in use, a part of said rail located in said front part (3) of the support to exert a locking pressure thereon;

wherein it further comprises:

- A locking wedge (700);
- A sliding guide (721) through which said locking wedge (700) is guided along an insertion/removal path;
- Said sliding guide being obtained in a position such as to guide the locking wedge (700) below the rear part (601) of the locking element (600) into a restraint position in which, following sliding of said locking wedge (700) under said rear part (601), the wedge raises said rear part (601) causing a flexing of the flexible element and thus generating a locking pressure which said front part (602) of the flexible element exerts on the part of the rail to be locked;
- wherein the length of the flexible element is such that, in said locking position, its rear part (601) protrudes at least partially from the seat (5), said sliding guide (721) positioning itself below said exceeding part so that the locking wedge acts on said rear part outside the seat (5);
- **Characterized in that** the said sliding guide (720) is arranged transversely with respect to the longitudinal direction of the seat (5).

2. The bearing (1), according to claim 1, wherein said locking wedge (700) includes a safety area (705, 706) delimited by one or more walls arranged in such a way that, when the rear part (601) of the flexible element is inserted in said safety area (705, 706) following insertion of the locking wedge under said rear part (601) of the flexible element, said walls prevent the locking wedge from sliding towards the removal direction.

3. The bearing (1) according to claim 2, wherein said safety area (705, 706) is in the form of a seat dug in the thickness of the locking wedge on the part of the back which in use faces the overlying flexible element.

4. The bearing (1) according to claim 3, wherein said seat (705, 706) has a plan shape which follows the plan shape of the part of the flexible element which is intended to fit in said seat.

5. The bearing (1), according to one or more of the preceding claims, wherein said locking wedge includes a front portion having a taper (701) which forms a bias for insertion.

6. The bearing, according to one or more of the preceding claims, wherein said locking wedge has a rear

part (703) extended in such a way as to form a striking surface.

7. The bearing (1), according to one or more of the preceding claims, wherein said sliding guide (720) is delimited by two opposite facing walls spaced apart from each other. 5
8. The bearing (1), according to claim 7, wherein said walls which delimit said sliding guide include a first wall (721) which rises orthogonally from a surface of said support (1) and a second wall which at least partially delimits the entrance to the seat (5). 10
9. The bearing (1), according to one or more of the preceding claims, wherein inside the seat (5) there is a protuberance (90) which forms a bias to facilitate the arrangement of the front part (602) of the flexible element above the base of the rail. 15
10. The bearing according to one or more of the preceding claims, wherein the flexible element is a flexible sheet. 20
11. The bearing, according to one or more of the preceding claims, wherein the seat (5) develops longitudinally and includes a front opening and a rear opening so that the flexible element can be inserted at the rear along the seat until one of its ends protrudes from the front opening, thereby overlapping the rail to be locked. 25
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12. A method of locking a rail (20) to a bearing (1) for railway switches, the method comprising the following steps: 35
 - Arranging the rail in a seat (3) of a support (2, 3) that is part of said bearing;
 - Inserting a flexible element (600) inside a seat (5) of the support (2, 3) until a position is reached in which the front part (602) of the flexible element is positioned above a part of the base of the rail arranged in the seat (3); 40
 - Loading the flexible element in such a way that said front part (602) exerts a locking pressure on the base of the rail with which it is in contact, locking it in position; 45
 - and wherein said loading operation includes the insertion of a locking wedge (700) which is made to slide along a sliding guide (721) until the said locking wedge (700) comes below a part (601) of the locking element (600) in such a way as to keep a part of it raised thereby causing a flexing of the flexible element which generates said locking pressure, the length of the flexible element being such that, in said locking position, its rear part (601) protrudes at least partially from the seat (5), said sliding guide (721) positioning 50
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itself below said exceeding part so that the locking wedge acts on said rear part outside the seat (5);

- **Characterized in that** the said sliding guide (720) is arranged transversely with respect to the longitudinal direction of the seat (5).

13. The method, according to claim 12, wherein the loading operation includes raising with a lever (250) of the rear part (601) of the flexible element so as to inflect it, the subsequent insertion along the sliding guide of the locking wedge below the rear of the flexible element and the subsequent release of the lever (250) so that the flexible element is maintained in said flexed position through said locking wedge.

Patentansprüche

1. Lagerung (1) für Eisenbahnweichen, umfassend:
 - Einen Träger (2, 3), umfassend einen hinteren Teil (2) mit einem Sitz (5) und einen vorderen Teil (3), auf den eine zu verriegelnde Schiene (20) zu montieren ist;
 - Eine Verriegelungsbaugruppe (600, 700, 720), um der Schiene (20) zu ermöglichen, an dem vorderen Teil (3) angebracht zu werden, wobei die Verriegelungsbaugruppe ein flexibles Element (600) mit einem vorderen Teil (602) und einem hinteren Teil (601) umfasst, wobei das flexible Element (600) in den Sitz (5) einführbar ist, bis eine Verriegelungsposition erreicht ist, in der der vordere Teil (602) des flexiblen Elements dem vorderen Teil (3) des Trägers zugewandt ist, so dass das vordere Ende (602) des flexiblen Elements im Gebrauch einen Teil der Schiene überlappt, die sich in dem vorderen Teil (3) des Trägers befindet, um einen Verriegelungsdruck darauf auszuüben; wobei es zudem umfasst: Eine Verriegelungskeil (700);
 - Eine Gleitführung (721), durch die der Verriegelungskeil (700) entlang eines Einführ-/Entnahmewegs geführt wird;
 - Wobei die Gleitführung in einer Position erhalten wird, sodass der Verriegelungskeil (700) unterhalb des hinteren Teils (601) des Verriegelungselements (600) in eine Rückhalteposition geführt wird, in der der Keil nach dem Gleiten des Verriegelungskeils (700) unter dem hinteren Teil (601) den hinteren Teil (601) anhebt, was eine Biegung des flexiblen Elements verursacht und somit einen Verriegelungsdruck erzeugt, den der vordere Teil (602) des flexiblen Elements auf den zu verriegelnden Teil der Schiene ausübt;
 - wobei die Länge des flexiblen Elements so ist,

- dass sein hinterer Teil (601) in der Verriegelungsposition zumindest teilweise aus dem Sitz (5) herausragt, wobei sich die Gleitführung (721) unterhalb des übersteigenden Teils positioniert, so dass der Verriegelungskeil außerhalb des Sitzes (5) auf den hinteren Teil wirkt;
- **Dadurch gekennzeichnet, dass** die genannte (720) quer zur Längsrichtung der Gleitführung des Sitzes (5) in Bezug darauf angeordnet ist.
2. Lagerung (1) nach Anspruch 1, wobei der Verriegelungskeil (700) einen Sicherheitsbereich (705, 706) einschließt, der durch eine oder mehrere Wände begrenzt ist, die so angeordnet sind, dass, wenn der hintere Teil (601) des flexiblen Elements nach dem Einführen des Verriegelungskeils unter den hinteren Teil (601) des flexiblen Elements in den Sicherheitsbereich (705, 706) eingeführt wird, die Wände verhindern, dass der Verriegelungskeil in Richtung der Entnahmerichtung gleitet.
 3. Lagerung (1) nach Anspruch 2, wobei der Sicherheitsbereich (705, 706) in Form eines Sitzes vorliegt, der in die Dicke des Verriegelungskeils auf dem Teil der Rückseite gegraben ist, der im Gebrauch dem darüber liegenden flexiblen Element zugewandt ist.
 4. Lagerung (1) nach Anspruch 3, wobei der Sitz (705, 706) eine Grundrissform aufweist, die der Grundrissform des Teils des flexiblen Elements folgt, der dazu bestimmt ist, in den Sitz zu passen.
 5. Lagerung (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei der Verriegelungskeil einen vorderen Abschnitt mit einer Verjüngung (701) einschließt, die eine Vorspannung zur Einführung bildet.
 6. Lagerung nach einem oder mehreren der vorhergehenden Ansprüche, wobei der Verriegelungskeil einen hinteren Teil (703) aufweist, der sich derart erstreckt, dass er eine Anschlagfläche bildet.
 7. Lagerung (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei die Gleitführung (720) durch zwei einander gegenüberliegende zugewandte Wände begrenzt ist, die voneinander beabstandet sind.
 8. Lagerung (1) nach Anspruch 7, wobei die Wände, die die Gleitführung begrenzen, eine erste Wand (721), die sich orthogonal von einer Oberfläche des Trägers (1) erhebt, und eine zweite Wand einschließen, die den Eingang zum Sitz (5) zumindest teilweise begrenzt.
 9. Lagerung (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei sich innerhalb des Sitzes (5) ein Vorsprung (90) befindet, der eine Vorspannung bildet, um die Anordnung des vorderen Teils (602) des flexiblen Elements oberhalb der Basis der Schiene zu erleichtern.
 10. Lagerung nach einem oder mehreren der vorhergehenden Ansprüche, wobei das flexible Element eine flexible Platte ist.
 11. Lagerung nach einem oder mehreren der vorhergehenden Ansprüche, wobei sich der Sitz (5) in Längsrichtung entwickelt und eine vordere Öffnung und eine hintere Öffnung einschließt, so dass das flexible Element hinten entlang des Sitzes eingeführt werden kann, bis eines seiner Enden aus der vorderen Öffnung herausragt, wodurch die zu verriegelnde Schiene überlappt wird.
 12. Verfahren zum Verriegeln einer Schiene (20) an einer Lagerung (1) für Eisenbahnweichen, wobei das Verfahren die folgenden Schritte umfasst:
 - Anordnen der Schiene in einem Sitz (3) eines Trägers (2, 3), der Teil der Lagerung ist;
 - Einführen eines flexiblen Elements (600) in einen Sitz (5) des Trägers (2, 3), bis eine Position erreicht wird, in der der vordere Teil (602) des flexiblen Elements über einem Teil der Basis der im Sitz (3) angeordneten Schiene positioniert wird;
 - Laden des flexiblen Elements, sodass der vordere Teil (602) einen Verriegelungsdruck auf die Basis der Schiene ausübt, mit der er in Kontakt steht, indem er sie in seiner Position verriegelt;
 - und wobei der Ladevorgang das Einsetzen eines Verriegelungskeils (700) einschließt, der veranlasst wird, entlang einer Gleitführung (721) zu gleiten, bis der Verriegelungskeil (700) unter einen Teil (601) des Verriegelungselements (600) gelangt, sodass ein Teil davon angehoben gehalten wird, wodurch eine Biegung des flexiblen Elements verursacht wird, die den Verriegelungsdruck erzeugt, wobei die Länge des flexiblen Elements so bemessen ist, dass in der Verriegelungsposition sein hinterer Teil (601) zumindest teilweise aus dem Sitz (5) herausragt, wobei die Gleitführung (721) sich unterhalb des übersteigenden Teils positioniert, so dass der Verriegelungskeil auf den hinteren Teil außerhalb des Sitzes (5) wirkt
- dadurch gekennzeichnet, dass** die Gleitführung (720) quer zur Längsrichtung des Sitzes (5) angeordnet ist.
13. Verfahren nach Anspruch 12, wobei der Ladevorgang das Anheben des hinteren Teils (601) des flexiblen Elements mit einem Hebel (250), um ihn zu

biegen, das anschließende Einführen des Verriegelungskeils entlang der Gleitführung unter der Rückseite des flexiblen Elements und das anschließende Lösen des Hebels (250), so dass das flexible Element durch den Verriegelungskeil in der gebeugten Position gehalten wird, einschließt.

Revendications

1. Palier (1) pour aiguillages ferroviaires comprenant :

- un support (2, 3) comprenant une partie arrière (2) ayant un siège (5) et une partie avant (3) sur laquelle monter un rail (20) à verrouiller ;
- un ensemble de verrouillage (600, 700, 720) permettant de fixer ledit rail (20) à ladite partie avant (3), ledit ensemble de verrouillage comprenant un élément flexible (600) ayant une partie avant (602) et une partie arrière (601), dans lequel l'élément flexible (600) peut être inséré à l'intérieur dudit siège (5) jusqu'à atteindre une position de verrouillage dans laquelle ladite partie avant (602) de l'élément flexible fait face à ladite partie avant (3) dudit support de sorte que ladite extrémité avant (602) de l'élément flexible chevauche, en cours d'utilisation, une partie dudit rail située dans ladite partie avant (3) du support afin d'exercer une pression de verrouillage sur celle-ci ;
- dans lequel il comprend en outre : une cale de verrouillage (700) ;
- un guide coulissant (721) à travers lequel ladite cale de verrouillage (700) est guidée le long d'une trajectoire d'insertion/retrait ;
- ledit guide coulissant étant obtenu dans une position telle qu'il guide la cale de verrouillage (700) sous la partie arrière (601) de l'élément de verrouillage (600) dans une position de retenue dans laquelle, suite au coulisement de ladite cale de verrouillage (700) sous ladite partie arrière (601), la cale soulève ladite partie arrière (601) provoquant une flexion de l'élément flexible et générant ainsi une pression de verrouillage que ladite partie avant (602) de l'élément flexible exerce sur la partie du rail à verrouiller ;
- dans lequel la longueur de l'élément flexible est telle que, dans ladite position de verrouillage, sa partie arrière (601) dépasse au moins partiellement du siège (5), ledit guide coulissant (721) se positionnant sous ladite partie dépassante de sorte que la cale de verrouillage agisse sur ladite partie arrière à l'extérieur du siège (5) ;
- **caractérisé en ce que** ledit guide coulissant (720) est disposé transversalement par rapport à la direction longitudinale du siège (5).

2. Palier (1), selon la revendication 1, dans lequel ladite

cale de verrouillage (700) comprend une zone de sécurité (705, 706) délimitée par une ou plusieurs parois disposées de telle sorte que, lorsque la partie arrière (601) de l'élément flexible est insérée dans ladite zone de sécurité (705, 706) après insertion de la cale de verrouillage sous ladite partie arrière (601) de l'élément flexible, lesdites parois empêchent la cale de verrouillage de coulisser vers la direction de retrait.

3. Palier (1) selon la revendication 2, dans laquelle lesdites zone de sécurité (705, 706) se présentent sous la forme d'un siège creusé dans l'épaisseur de la cale de verrouillage sur la partie du dossier qui, en cours d'utilisation, fait face à l'élément flexible sus-jacent.
4. Palier (1) selon la revendication 3, dans lequel ledit siège (705, 706) a une forme en plan qui suit la forme en plan de la partie de l'élément flexible qui est destinée à s'insérer dans ledit siège.
5. Palier (1), selon l'une ou plusieurs des revendications précédentes, dans lequel ladite cale de verrouillage comprend une partie avant ayant un cône (701) qui forme un biais pour l'insertion.
6. Palier selon l'une ou plusieurs des revendications précédentes, dans lequel ladite cale de verrouillage a une partie arrière (703) prolongée de manière à former une surface de frappe.
7. Palier (1), selon l'une ou plusieurs des revendications précédentes, dans lequel ledit guide de coulisement (720) est délimité par deux parois opposées espacées l'une de l'autre.
8. Palier (1), selon la revendication 7, dans lequel lesdites parois qui délimitent ledit guide de coulisement comprennent une première paroi (721) qui s'élève orthogonalement à partir d'une surface dudit support (1) et une seconde paroi qui délimite au moins partiellement l'entrée du siège (5).
9. Palier (1), selon l'une ou plusieurs des revendications précédentes, dans lequel à l'intérieur du siège (5) il y a une protubérance (90) qui forme un biais pour faciliter la disposition de la partie avant (602) de l'élément flexible au-dessus de la base du rail.
10. Palier selon l'une ou plusieurs des revendications précédentes, dans lequel l'élément flexible est une feuille flexible.
11. Palier, selon l'une ou plusieurs des revendications précédentes, dans lequel le siège (5) se développe longitudinalement et comprend une ouverture avant et une ouverture arrière de sorte que l'élément flexi-

ble peut être inséré à l'arrière le long du siège jusqu'à ce que l'une de ses extrémités dépasse de l'ouverture avant, chevauchant ainsi le rail à verrouiller.

12. Procédé de verrouillage d'un rail (20) sur un palier (1) pour aiguillages ferroviaires, le procédé comprenant les étapes suivantes :

- Disposer le rail dans un siège (3) d'un support (2, 3) faisant partie dudit palier ; 10
- Insérer un élément flexible (600) à l'intérieur d'un siège (5) du support (2, 3) jusqu'à atteindre une position dans laquelle la partie avant (602) de l'élément flexible est positionnée au-dessus d'une partie de la base du rail disposée dans le siège (3) ; 15
- Charger l'élément flexible de manière à ce que ladite partie avant (602) exerce une pression de verrouillage sur la base du rail avec laquelle elle est en contact, la verrouillant ainsi en position ; 20
- et dans lequel ladite opération de chargement comprend l'insertion d'une cale de verrouillage (700) qui est amenée à coulisser le long d'un guide coulissant (721) jusqu'à ce que ladite cale de verrouillage (700) vienne sous une partie (601) de l'élément de verrouillage (600) de manière à en maintenir une partie soulevée provoquant ainsi une flexion de l'élément flexible qui génère ladite pression de verrouillage, la longueur de l'élément flexible étant telle que, dans ladite position de verrouillage, sa partie arrière (601) dépasse au moins partiellement du siège (5) ledit guide coulissant (721) se positionnant sous ladite partie dépassante de manière à ce que la cale de verrouillage agisse sur ladite partie arrière à l'extérieur du siège (5) 35

Caractérisé en ce que ledit guide coulissant (720) est disposé transversalement par rapport à la direction longitudinale du siège (5). 40

13. Procédé selon la revendication 12, dans lequel l'opération de chargement comprend le soulèvement, à l'aide d'un levier (250), de la partie arrière (601) de l'élément flexible de manière à la fléchir, l'insertion ultérieure, le long du guide coulissant, de la cale de verrouillage sous l'arrière de l'élément flexible et le relâchement ultérieur du levier (250) de manière à ce que l'élément flexible soit maintenu dans ladite position fléchie à travers ladite cale de verrouillage. 50

55

FIG. 1

(PRIOR ART)

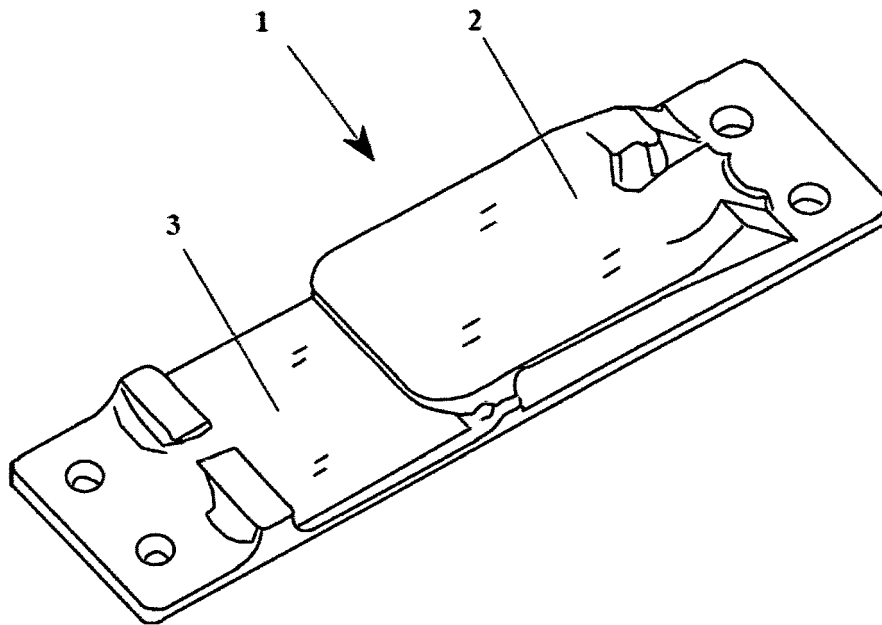


FIG. 2

(PRIOR ART)

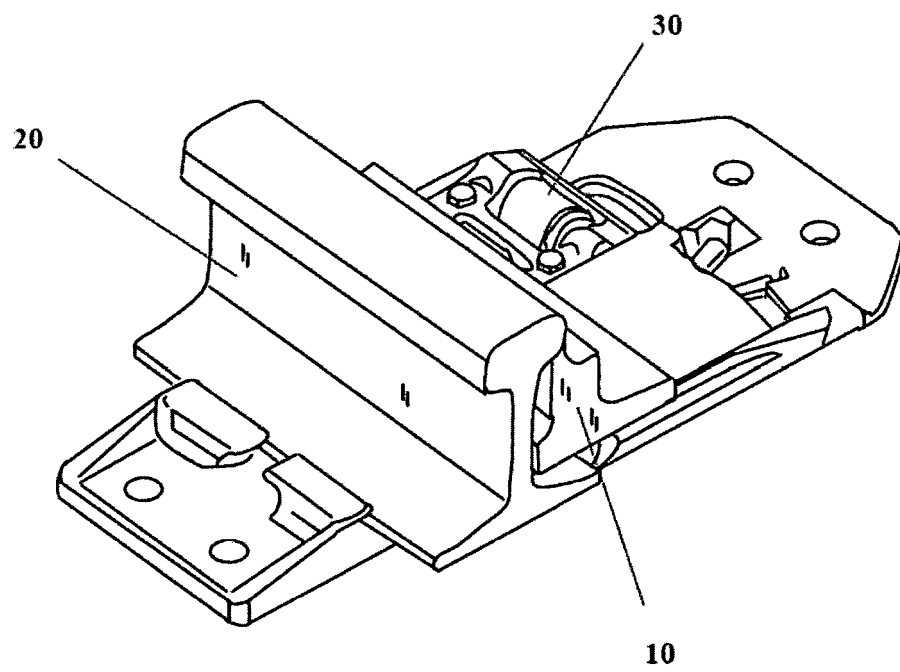


FIG. 3
(PRIOR ART)

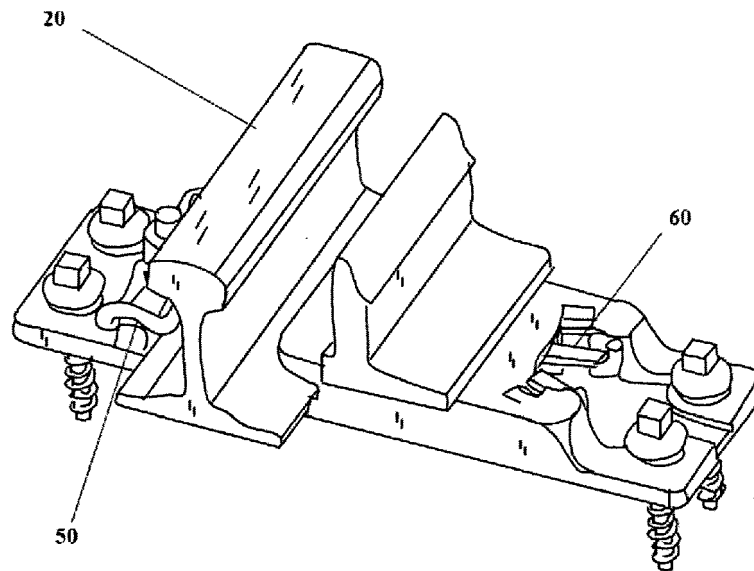
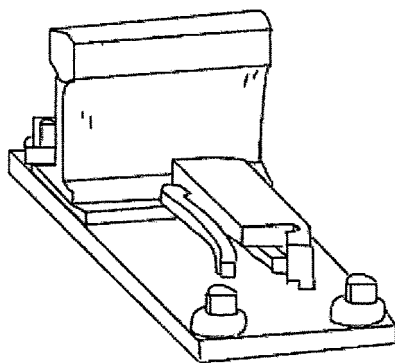


FIG. 4
(PRIOR ART)

PHASE A



PHASE B

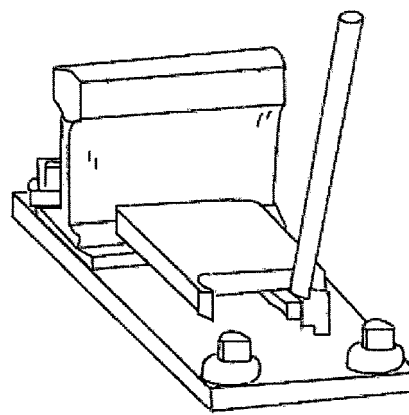


FIG. 5
(PRIOR ART)

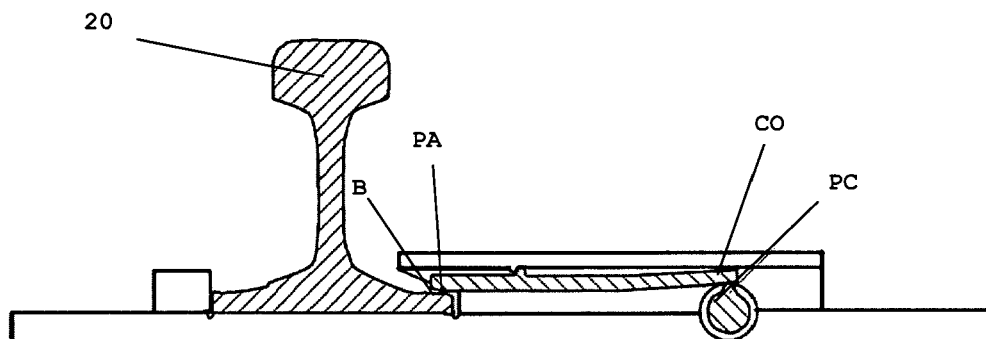


FIG. 6

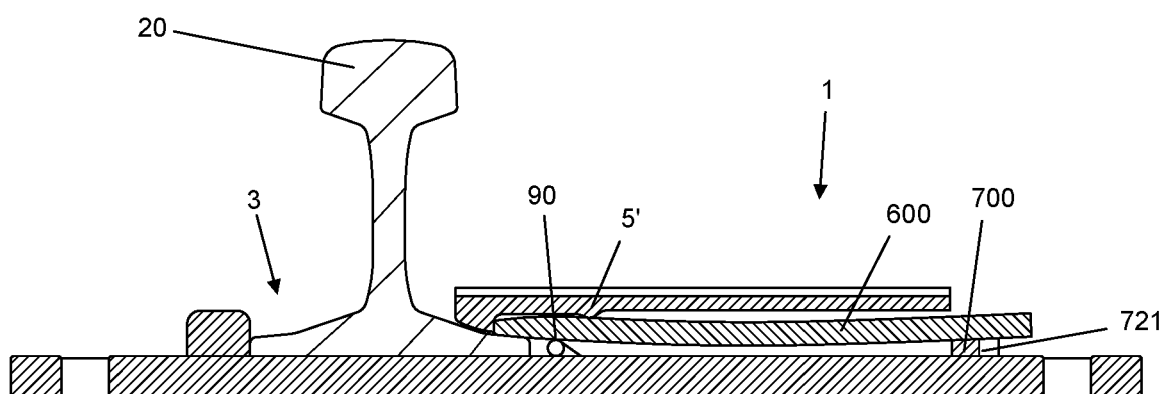


FIG. 7

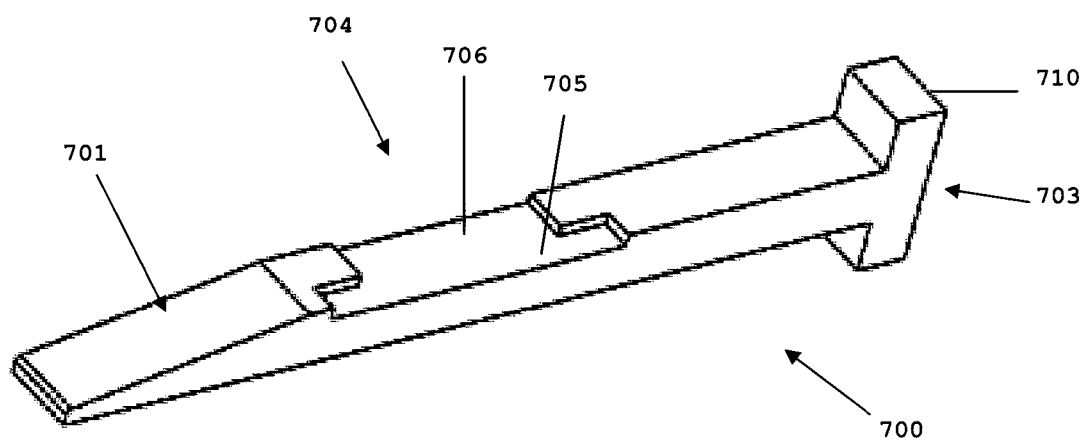


FIG. 8

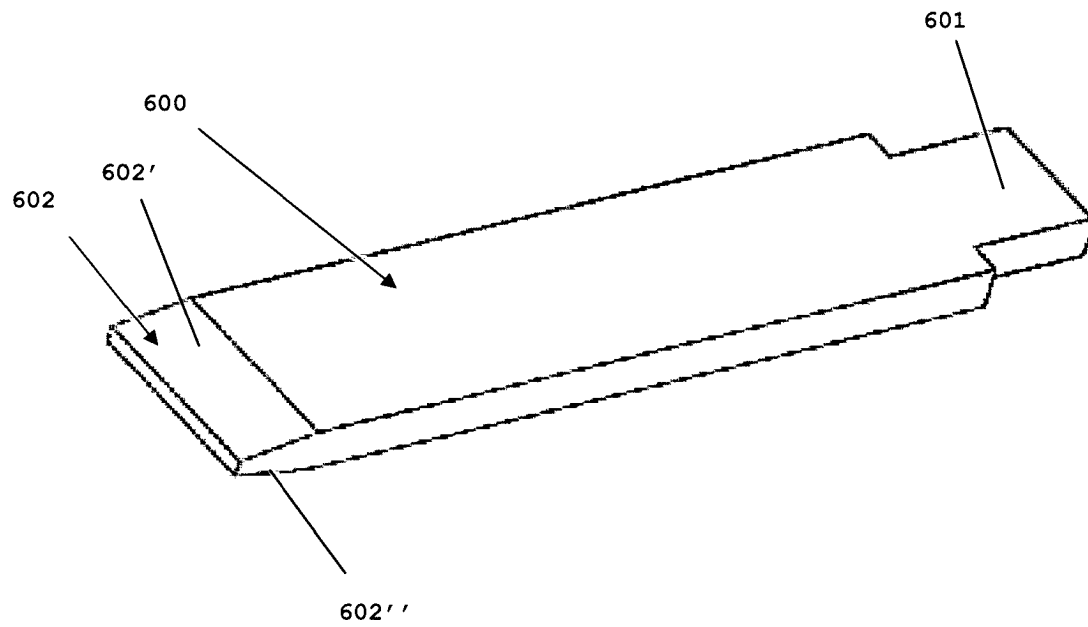


FIG. 9

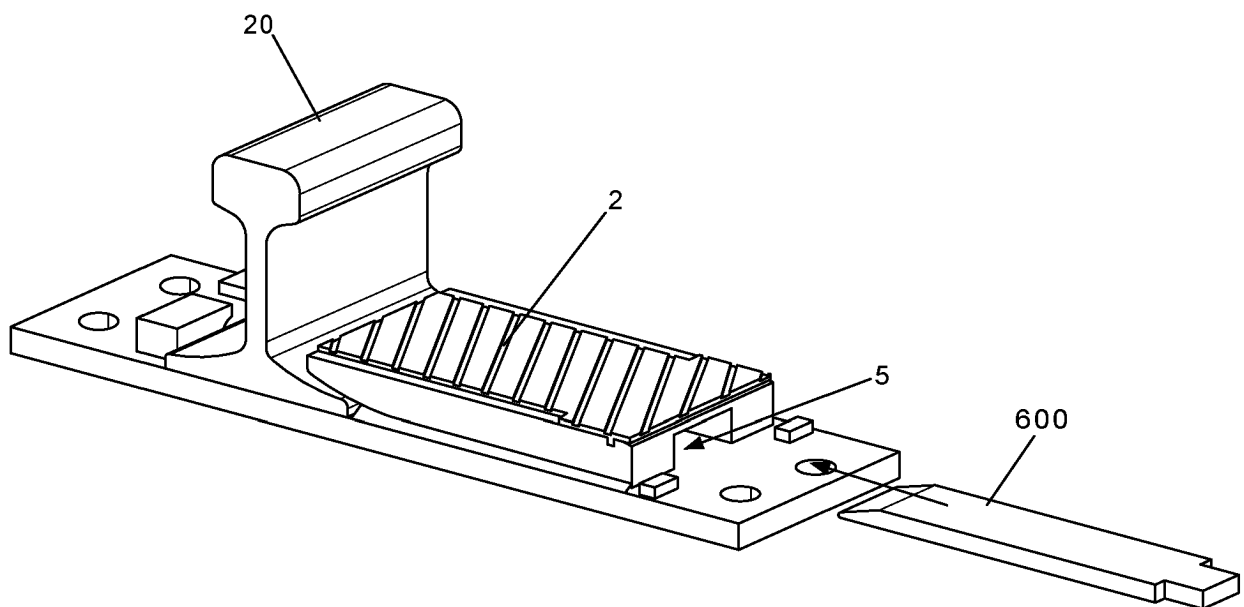


FIG. 10

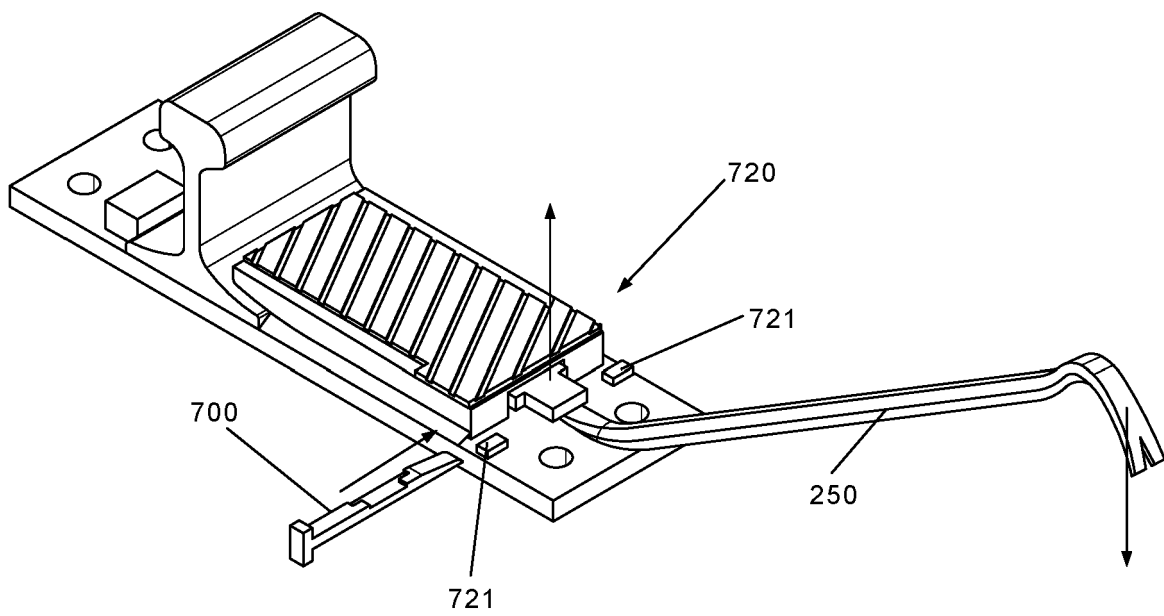
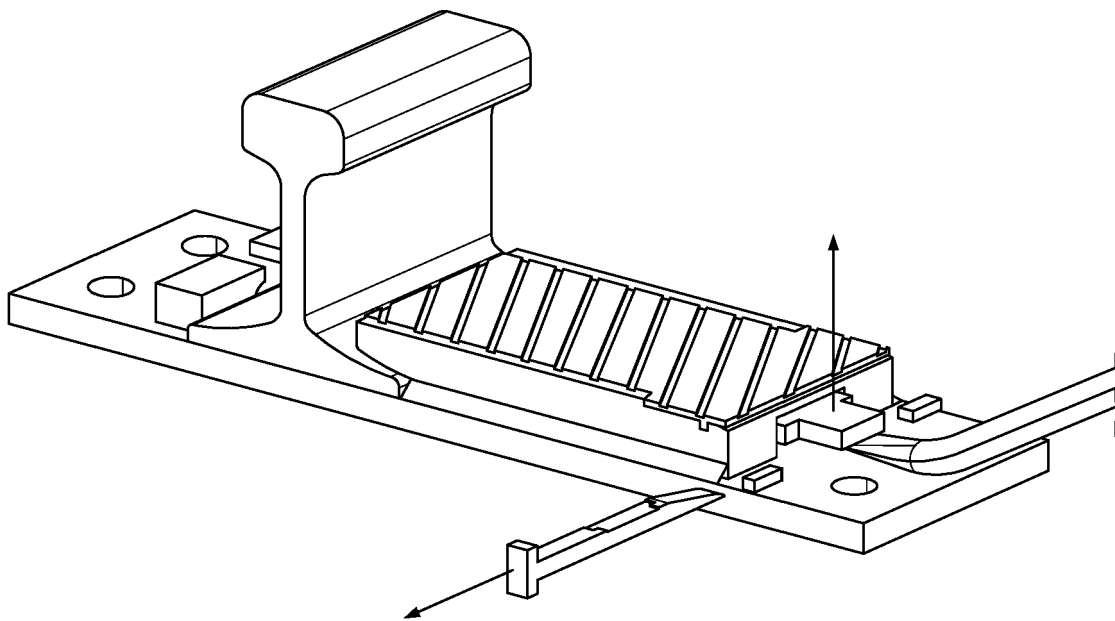


FIG. 11



REFERENCES CITED IN THE DESCRIPTION

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