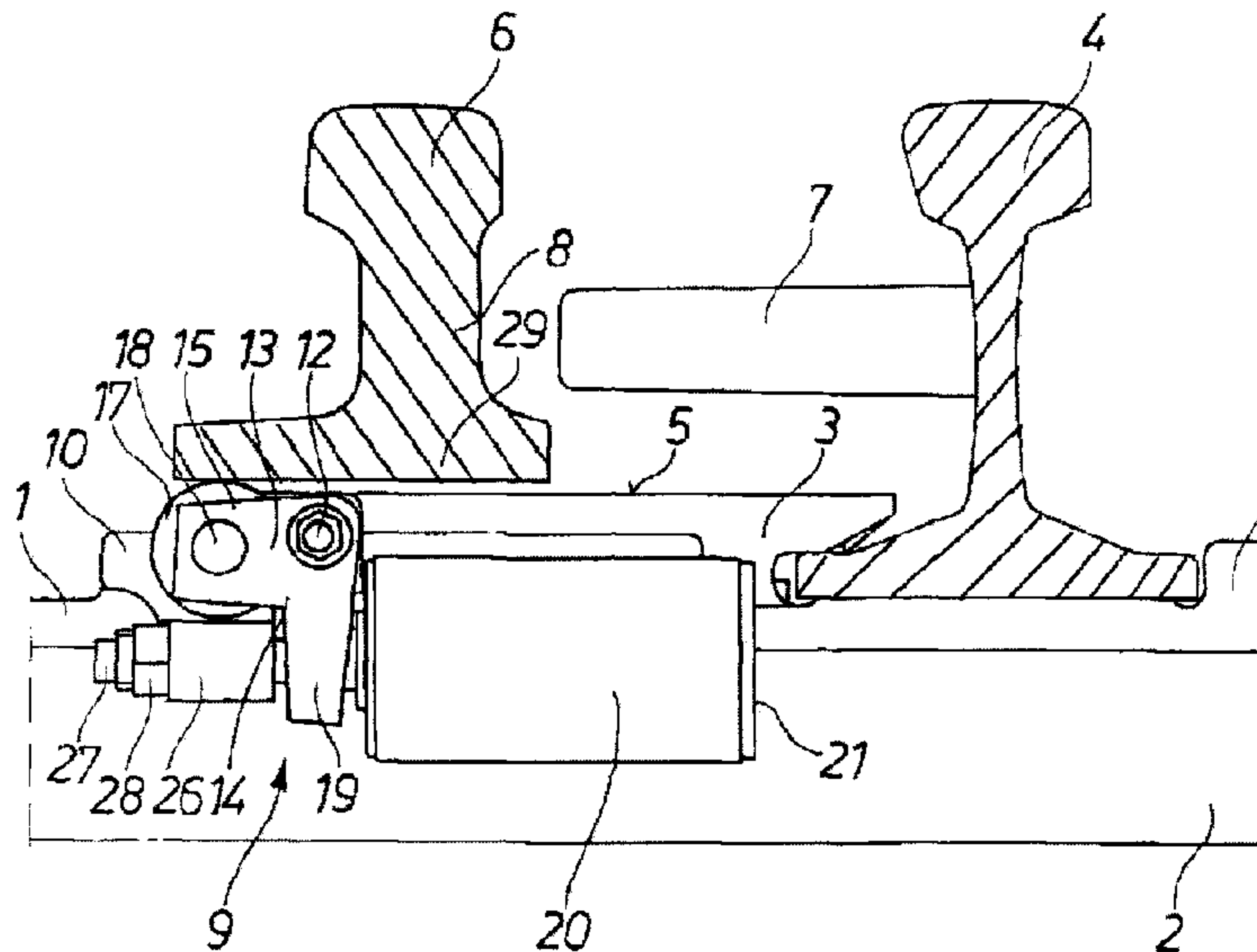




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(54) **Titre : SUPPORT A GALETS POUR L'AIGUILLE D'UN AIGUILLAGE**  
 (54) **Title: ROLLER SUPPORT FOR THE POINT RAIL OF A RAILROAD SWITCH**



(57) **Abrégé/Abstract:**

A point rail is shiftable transversely on an upper face of a rail base plate between an engaged position bearing on a longitudinally extending and fixed stock rail and a disengaged position spaced transversely of the stock rail. A roller assembly has a mounting plate securable to the rail base plate, a roller support pivotal about a support axis on the rail base plate, a roller carried on the roller support, and a spring biasing the roller upward with a predetermined spring force into a lift position with the roller projecting upward past the upper face for supporting the point rail on the roller. Thus this assembly supports the point rail and, in the engaged position, presses it against the support cleats and the stock rail and it is an integral part of one of the rail base plates.



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## ABSTRACT OF THE DISCLOSURE

A point rail is shiftable transversely on an upper face of a rail base plate between an engaged position bearing on a longitudinally extending and fixed stock rail and a disengaged position spaced transversely of the stock rail. A roller assembly has a mounting plate securable to the rail base plate, a roller support pivotal about a support axis on the rail base plate, a roller carried on the roller support, and a spring biasing the roller upward with a predetermined spring force into a lift position with the roller projecting upward past the upper face for supporting the point rail on the roller. Thus this assembly supports the point rail and, in the engaged position, presses it against the support cleats and the stock rail and it is an integral part of one of the rail base plates.

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**ROLLER SUPPORT FOR THE POINT RAIL OF A RAILROAD SWITCH****SPECIFICATION****FIELD OF THE INVENTION**

The present invention relates to a railroad switch.  
5 More particularly this invention concerns a roller support for  
such a railroad switch.

**BACKGROUND OF THE INVENTION**

A typical railroad switch has a pair of point rails  
movable into and out of engagement with respective stock rails  
10 for diverting a train on the stock rails to a siding or other  
track. Each of the point rails is moved by a roller assembly  
comprising a support carrying at least one roller and resiliently  
supported on a rail base plate formed as a slide plate or slide  
chair. The point rail is supported on the roller at least during  
15 a switching process.

Roller assemblies designed in such a manner are well  
known from the prior art and allow the point rail to be slightly  
lifted during the opening or switching process and therefore not  
in contact anymore with the slide chair or the slide surface of  
20 the rail base plate. In so doing, the point rail moves over a  
roller or rolling bodies that effect a significant reduction of

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the switching forces and allow the slide chairs or slide surfaces to be lubricant-free.

For an accurate height adjustment of the uppermost tangent plane of the rollers, the same are resiliently mounted as described, for example, in DE 295 09 542.

The roller mounting has a pure load-bearing function here during the switching process so that the point rail, in the position in which it abuts against the stock rail, rests on the slide chair or the slide surface of the rail base plate.

In this so-called closed state, the point rail bears within the switch arrangement with its point tip against the stock rail and with its root region or point rail web against support cleats or spacer blocks. After a long period of use, i.e. by running many times over the point rail with the full wheel load in the root region, the given or pre-bent shape of the point rail changes in the longitudinal direction of the rail. As a result of the shape change, the point rail no longer comes into abutment in the web region with the support cleats or spacer blocks. When running over the point rail, this state can result in significant wear on the slide chairs or the slide surfaces of the rail base plates because the point rail is brought in an undesirable manner into abutment against the support cleats only by the transverse force of the wheel running over the point rail. Here, very significant friction forces occur between the bottom side of the point foot and the slide chair or the slide surfaces

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of the respective rail base plates as a result of the additionally vertical vector of wheel force.

In order to avoid this disadvantage it became known from EP 0 654 561 [US 5,509,626] that a roller support having at least one holder for at least one roller is mounted to resiliently move in a direction toward the stock rail, the point rail abutting via the roller against the stock rail and therefore, the resistance during the movement of the point rail is kept low.

To this end, the roller is partially slid underneath the point rail by a leaf spring. Spacers make it then possible to adequately fix the roller against the force of a separate spring and in abutment against the foot of the point rail.

This roller assembly is mounted via the leaf springs and retaining elements provided at its ends on two adjacent switch sleepers of a track bed and therefore lies in the center of the space between two sleepers.

As a result, the roller assembly projects into the tamping region for ballast underneath the switch sleepers. This means that the roller assembly has to be disassembled prior to tamping the ballast, then reassembled and subsequently readjusted.

Further, this roller assembly can only be assembled after the switch system has been installed on site. This results in work-related additional expenses and time delays on the construction site.

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## OBJECTS OF THE INVENTION

It is therefore an object of the present invention to provide an improved roller support for the point rail of a railroad switch.

5 Another object is the provision of such an improved roller support for the point rail of a railroad switch that overcomes the above-given disadvantages, in particular in which the rollers can be exactly positioned vertically as well as horizontally with respect to the point rail.

10 A further object is to provide such a roller assembly that can be retrofitted without a major amount of work to an existing switch of conventional design.

## SUMMARY OF THE INVENTION

15 A point rail is shiftable transversely on an upper face of a rail base plate between an engaged position bearing on a longitudinally extending and fixed stock rail and a disengaged position spaced transversely of the stock rail. A roller assembly has according to the invention a mounting plate securable to the rail base plate, a roller support pivotal about  
20 a support axis on the rail base plate, a roller carried on the roller support, and a spring biasing the roller upward with a predetermined spring force into a lift position with the roller projecting upward past the upper face for supporting the point

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rail on the roller. Thus this assembly supports the point rail and, in the engaged position, presses it against the support cleats and the stock rail and it is an integral part of one of the rail base plates.

5           With the roller assembly according to the invention, switching the point rail can also be done with a plurality of rollers arranged one behind the other or side by side in the roller support so that there is no connection to adjacent switch sleepers or rail base plates of a switch system. The tamping  
10 region is free of structure and is freely accessible at any time.

          This means that the mounting plate and the roller support that is pivotable via the pivot axle thereon as well as a spring subassembly acting on the roller support with a preset spring force can be preassembled on the rail base plate in a  
15 workshop. On site, in the switch system, the only thing necessary during the initial installation of the roller assembly, for example on a track sleeper, is to adjust the horizontal spacing between the roller support and the stock rail or point rail. To this end, the mounting plate is advantageously provided  
20 with slots extending in the longitudinal direction of the rail base plate.

          In a preferred configuration of the invention the roller support is a two-arm lever having a horizontally extending arm that holds the roller and a vertically downwardly extending  
25 arm that is biased by the spring subassembly. The two-arm lever and the spring subassembly acting on the vertical arm extend

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transverse to the stock rail and are under the point rail. Thus, they are located directly laterally beside the rail base plate between two switch sleepers or rail fastening points. On the one hand, this arrangement offers good protection against damage and, on the other, at the same time, a sufficiently large free space between the switch sleepers so that consolidating the ballast in this region by tamping can be done even after installation of the roller assembly.

An advantageous configuration of the invention provides that the spring subassembly has a spring braced in a housing on a disk of a piston rod and at the opposite end on a housing wall, the piston rod passing with clearance through the vertical arm of the roller support and an abutment formed on the mounting plate and arranged below the horizontal arm to the roller, and a threaded nut is screwed onto the protruding threaded end of the piston rod. The spring subassembly connected in this manner to the roller support and the mounting plate acts via its spring, for example a disk or spiral spring, on the vertical arm of the roller support with a defined, continuously applied spring force.

In the position of the point rail remote from the stock rail or, respectively, during the switching process from the engaged position abutting against the stock rail into the disengaged position, the roller support is pushed downward against the spring force via the point rail foot resting on the roller and the weight of the point rail. The biasing of the spring means is selected such that despite the load of the point



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rail, the outer periphery of the roller lies above the rail base plate and therefore the point rail rests in the disengaged position or during the switching process on the roller and is clear of the rail base plate.

5           In the point rail's position abutting the stock rail, the so-called engaged position of the switch, the spring subassembly applies biasing force that pivots the roller support toward abutment with the mounting plate, and the foot of the point rail drops off the roller to sit solidly on the upper slide  
10 face of the chair or base plate. Along with this, the roller engaged below its outer periphery against the point foot of the point rail and presses it with the preset, defined spring force against the stock rail or the support cleats.

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In some embodiments, there is provided a roller assembly for a point rail of a switch associated with a stock rail, including a roller holder which receives at least one roller, and which via a spring subassembly is resiliently supported on a rail base plate formed as a slide plate or slide chair, the point rail resting on the roller at least during the switching process, and the roller holder being resiliently supported on a mounting plate which is connected to the rail base plate and being pivotable about an axle of the mounting plate, the spring subassembly having a spring element which is supported in a housing on a disk of a piston rod, and at the opposite end is supported on a housing wall, wherein the roller holder in the installed state is situated directly laterally beside the rail base plate, between two switch sleepers or rail fastening locations, and wherein the piston rod passes through a vertical arm of the roller holder and an abutment formed on the mounting plate beneath a horizontal arm, with clearance with respect to the roller, and a threaded nut is screwed onto the protruding threaded end of the piston rod.

20

## BRIEF DESCRIPTION OF THE DRAWING

The above and other objects, features, and advantages will become more readily apparent from the following description, reference being made to the accompanying drawing in which:

25

FIG. 1 is a vertical section through a roller assembly on a switch sleeper of a switch with the point rail disengaged from the stock rail;

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FIG. 2 is a view like FIG. 1 but with the point rail engaging the stock rail;

FIG. 3 is a perspective view of just the roller assembly; and

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FIG. 4 is a top view of the structure in the engaged position as seen in FIG. 2.

#### DETAILED DESCRIPTION

As seen in FIGS. 1, 2, and 4, one of two railroad stock rails 4 running parallel and spaced apart from each other is secured by respective standard base plates 1 to two transversely extending concrete sleepers 2, one of which is provided with a switch according to the invention. The rail base plate 1 is formed with a slide chair 3 fitting at one side with the foot of the stock rail 4 and that, on its planar upper face, forms a support face 5 for a point rail 6.

Spacers or cleats 7, one of which is shown in the drawing, project transversely from the stock rail 4 toward the point rail 6. In the switch, the point rail 6 abuts in the engaged position along the length of the switch against the stock rail 4 in a slightly curved course, i.e. at one end spaced by the support cleats 7 that abut against the point rail web 8 as shown in the FIGS. 2 and 4 and, at the other end, with the tip of the point rail 6 abutting directly against the stock rail 4.

A roller assembly 9 is provided for supporting the point rail 6 as it moves between a disengaged position remote from the stock rail 4 (FIG. 1) and an engaged position bearing directly or indirectly via the cleats on the stock rail (FIG. 2).

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The roller assembly 9 has a mounting plate 10 that is displaceable transversely of the stock rail 4 via transversely elongated slots 11 for positioning it and, in the adjusted end position, fixedly connecting it, for example by nuts 31, to the rail base plate 1.

At an end of the mounting plate 10 that projects beyond the edge of the rail base plate 1 and the switch sleeper 2, a roller support 13 is pivotable on a horizontal pivot axle 12 fixed in the mounting plate 10 and extending longitudinally parallel to the stock rail 4. The roller holder 13 is a two-arm lever 14 having a horizontally extending forked arm 15 that receives a roller 17 in a U-shaped intermediate space 16 where it is mounted in a free-running manner on a pivot axle 18. A vertically downwardly extending arm 19 of the roller holder 13 is pressed by a spring subassembly 20 with a permanent spring force in a direction urging the roller 17 in an arc upward and horizontally toward the stock rail 4. FIG. 4 shows how the roller holder 13 is between two switch sleepers 2, and optionally between two rail fastening locations 30. It also is immediately next to the sleeper carrying its plate 1 and largely underneath the point rail 4, so that when ballast is tamped between the sleepers 2 it does not get in the way.

The spring subassembly 20 has a cylindrical housing 21 that is secured to the vertical arm 19 and normally extends horizontally but at least in a vertical plane perpendicular to the stock rails 4. This housing 21 holds a spiral spring 25

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braced at one end against a disk 22 of a piston rod 23 and at the opposite end on a housing wall 24 itself fixed to the arm 19.

The piston rod 23 projects out of the housing 21 and passes with clearance through the vertical arm 19 of the roller holder 13 and

5 through an abutment 26 formed on the mounting plate 10. A

threaded nut 28 is screwed onto a free threaded end 27 of the

piston rod 23. By loosening or tightening the threaded nut 28,

the prestress of the spiral spring 25 can be varied and thus a

defined spring force can be set that the roller 17 exerts mainly

10 upward.

The variation of the spring force allows a height

adjustment of the roller 17 with respect to the support face 5 of

the slide chair 3. This allows adjustment of the extent the

outer periphery of the roller 17 projects upward beyond the

15 support face 5 and, as a result, a foot 29 of the point rail 6 is

lifted off the support face 5 to a greater or lesser extent (see

FIG. 1).

In the engaged position according to FIG. 2 in which

the foot 29 of the point rail 6 rests on the support face 5 and

20 the point rail 6 is pressed directly or indirectly via the

spacers 7 against the stock rail 4, the spiral spring 25 extends

and pivots the roller holder 13 with its vertical arm 19 toward

the abutment 26, so that then the roller 17 presses the point

rail 6 with a defined spring force horizontally toward the

25 support cleats 7 to bear on it horizontally with a predetermined

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spring force on it. To ensure this function, the vertical arm 19 keeps always is at a slight spacing from the abutment 26.

If now vibrations are transmitted into the point rail 6 when the switch is run over, the vibrations can be absorbed and  
5 damped so that there is no chattering of the point rail 6 against  
the support cleat 7 or the support face 5

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CLAIMS:

1. A roller assembly for a point rail of a switch associated with a stock rail, including a roller holder which receives at least one roller, and which via a spring  
5 subassembly is resiliently supported on a rail base plate formed as a slide plate or slide chair, the point rail resting on the roller at least during the switching process, and the roller holder being resiliently supported on a mounting plate which is connected to the rail base plate and being pivotable  
10 about an axle of the mounting plate, the spring subassembly having a spring element which is supported in a housing on a disk of a piston rod, and at the opposite end is supported on a housing wall, wherein the roller holder in the installed state is situated directly laterally beside the rail base plate,  
15 between two switch sleepers or rail fastening locations, and wherein the piston rod passes through a vertical arm of the roller holder and an abutment formed on the mounting plate beneath a horizontal arm, with clearance with respect to the roller, and a threaded nut is screwed onto the protruding  
20 threaded end of the piston rod.

2. The roller assembly according to Claim 1, wherein the spring subassembly engages with the roller holder with a preset, defined spring force.

3. The roller assembly according to Claim 1 or 2,  
25 wherein the roller holder is designed as an angled profile whose arm which extends horizontally with respect to the mounting plate receives the roller, and whose arm which extends vertically downwardly is acted on by the spring subassembly.

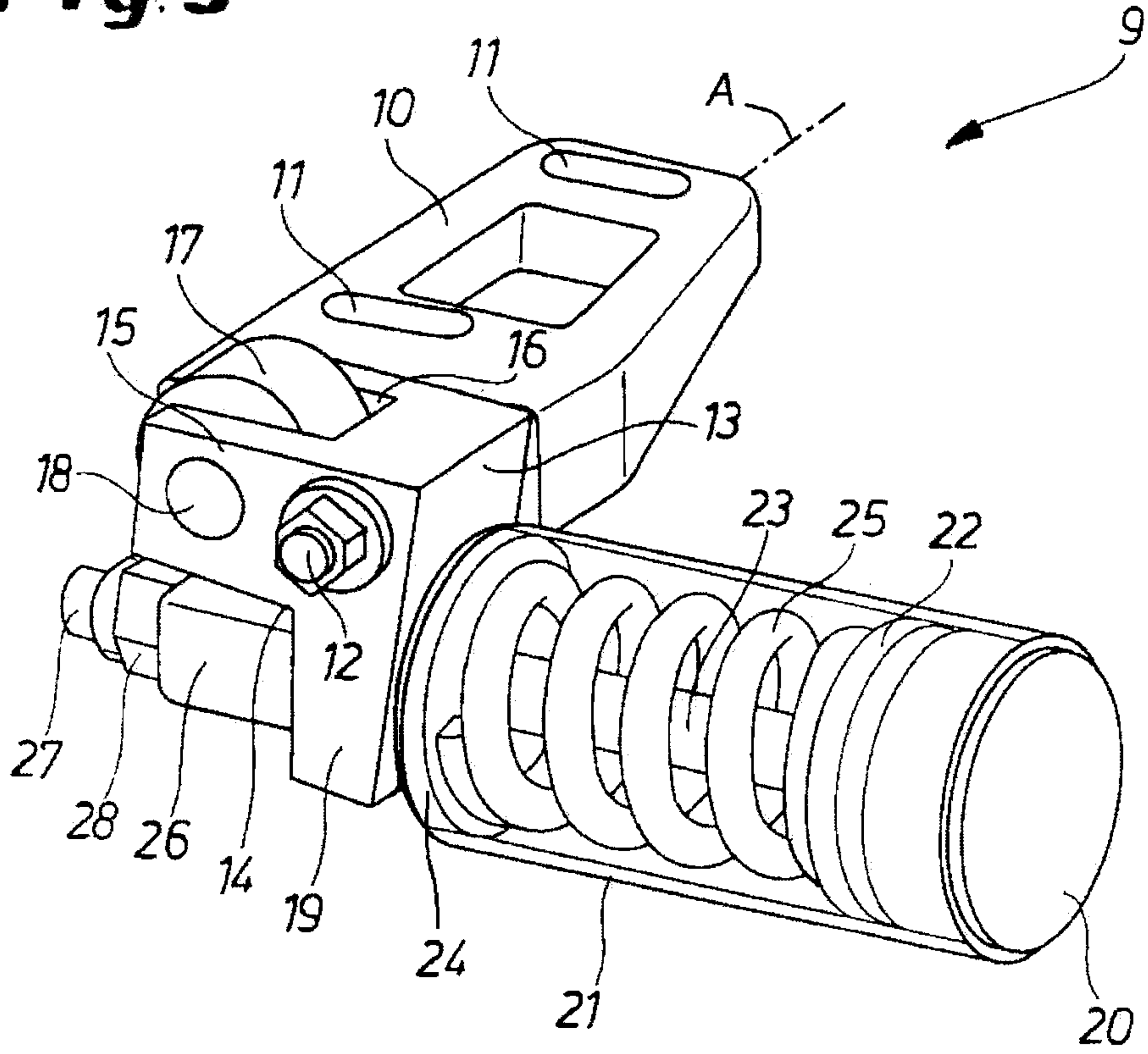


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4. The roller assembly according to any one of Claims 1 to 3, wherein the spring subassembly is provided transversely with respect to the stock rail, underneath the point rail.



**Fig. 3**



**Fig. 4**

