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Dohse et al.

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[54] **DEFLECTING DEVICE WITH GAPS LOCKED IN A WEDGE-TYPE MANNER**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.**.....**246/448**, 246/442

[51] **Int. Cl.**.....**E01b 7/08**

[58] **Field of Search**.....246/415, 435–442, 246/443, 448

[56] **References Cited**

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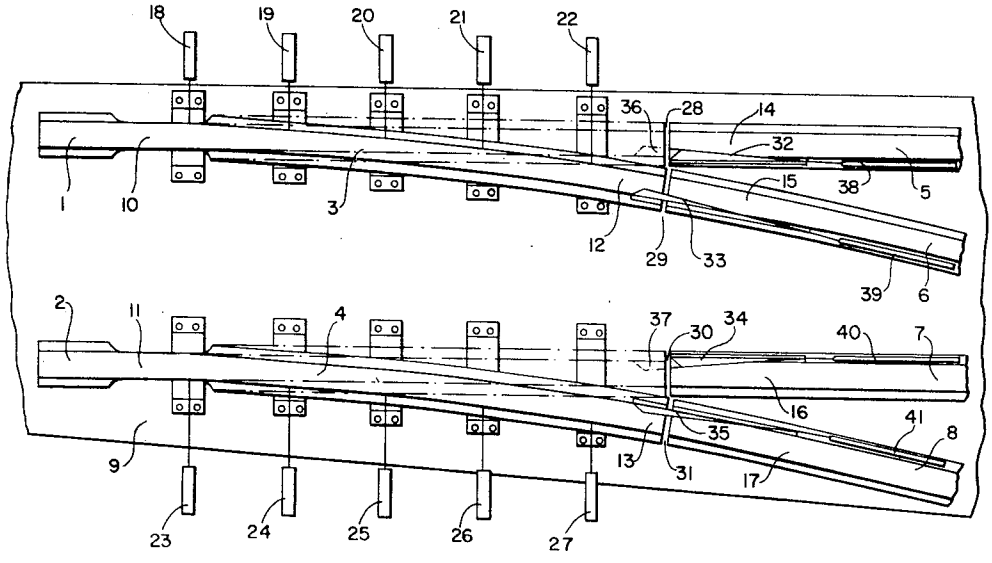
[57] **ABSTRACT**

This invention relates to a deflecting device for switches which can be negotiated at high speeds free from vibrations and shocks in the branch rail comprising tongue means, wedge means for closing the gaps between said tongue means and connecting rails, and means for moving said wedge means into and out of the closed position.

10 Claims, 5 Drawing Figures



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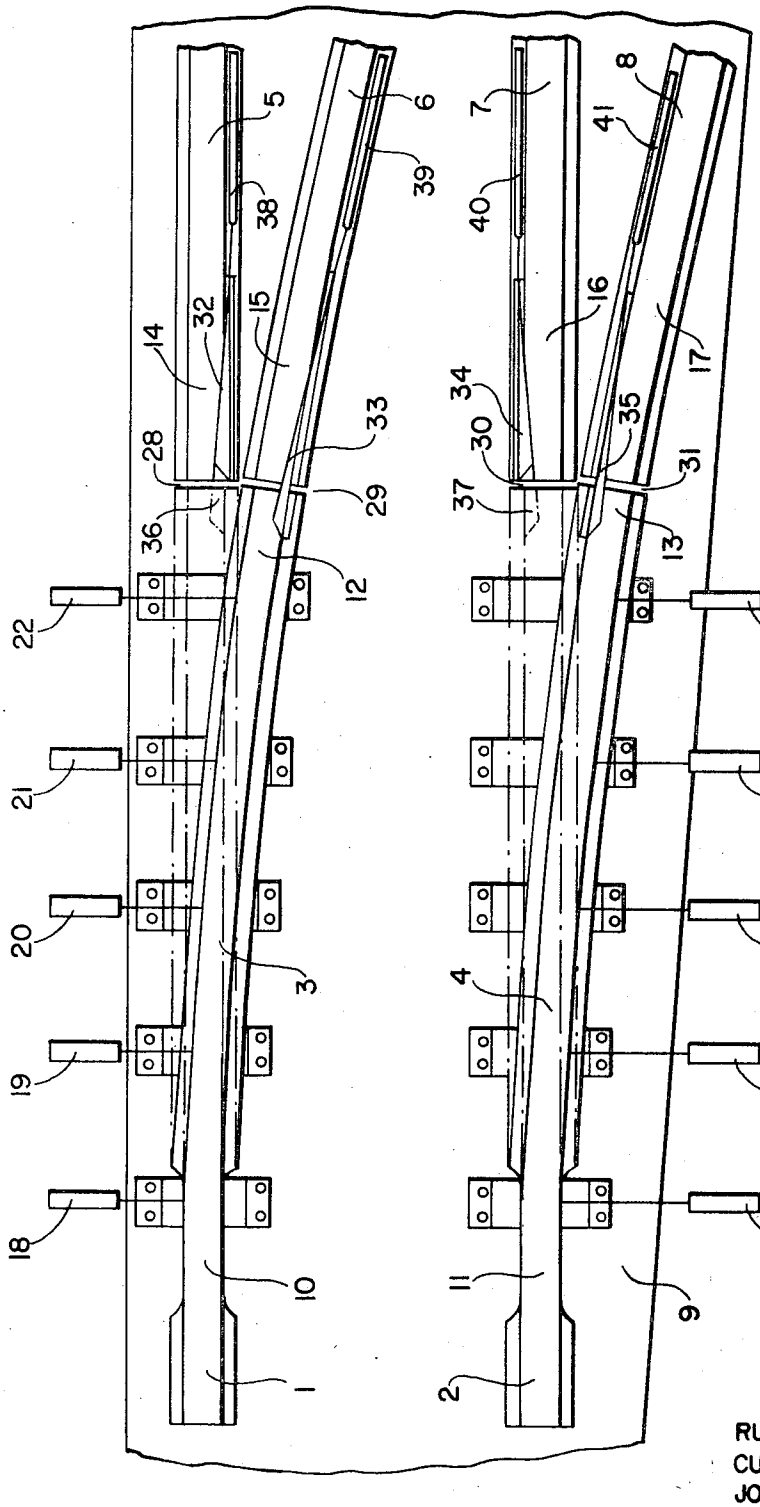

FIG. 1

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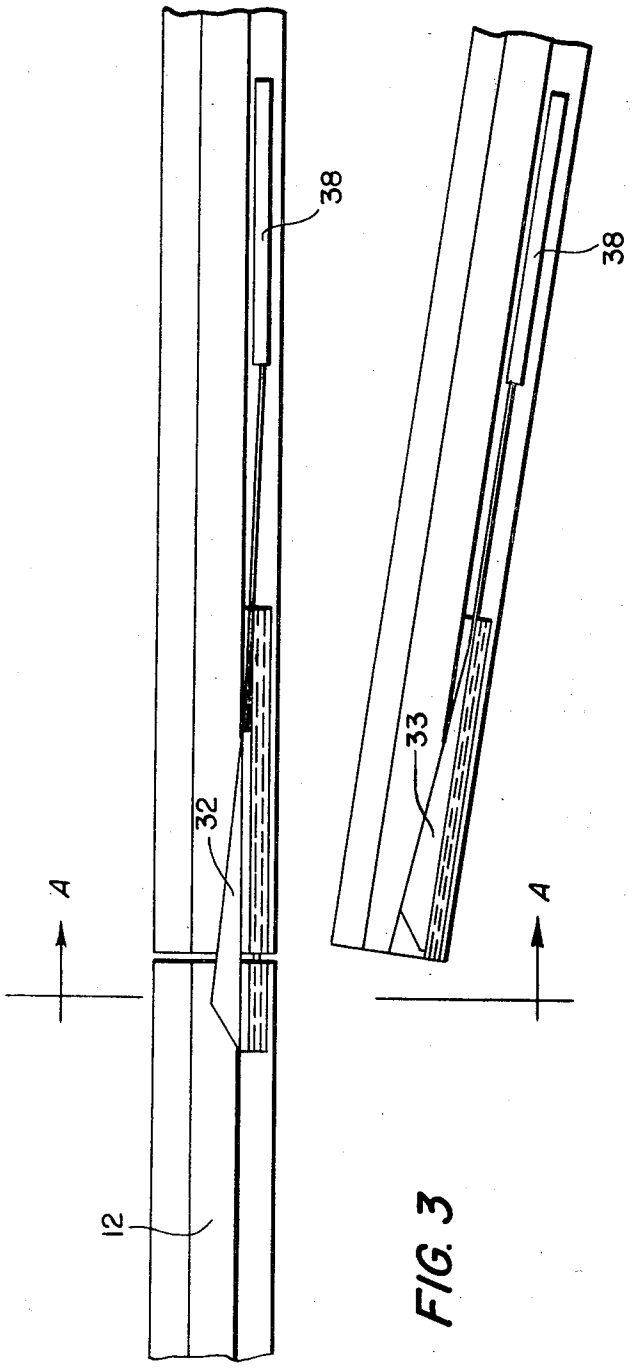

FIG. 3

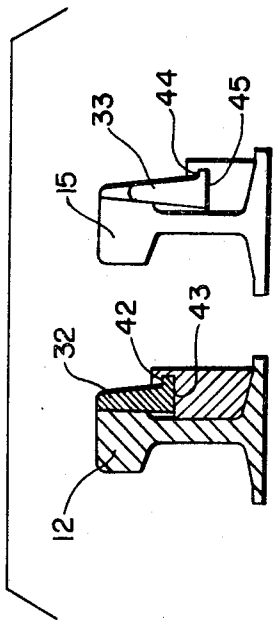

FIG. 5

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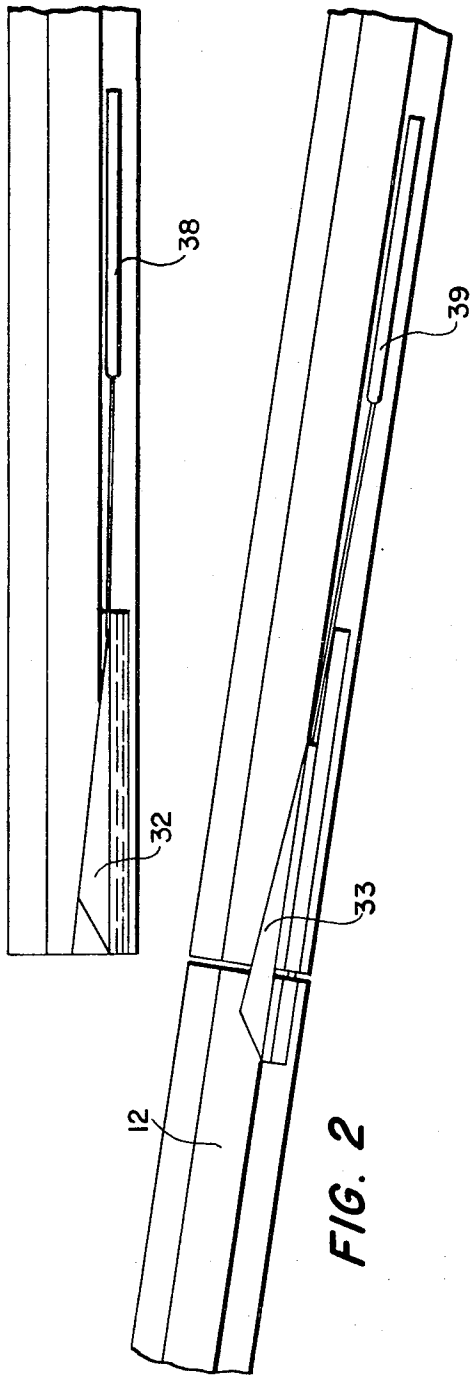

FIG. 2

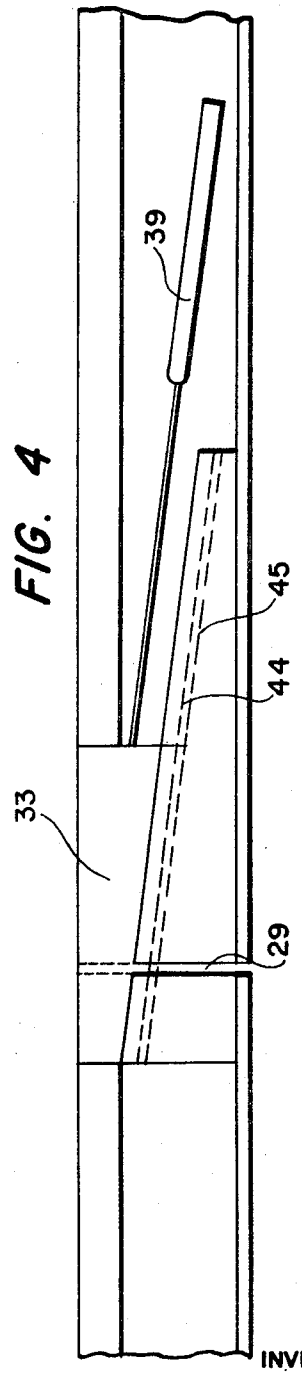

FIG. 4

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DEFLECTING DEVICE WITH GAPS LOCKED IN A WEDGE-TYPE MANNER

The present invention relates to a deflecting device with gaps locked in a wedge-type manner which can be negotiated at the highest speeds and with great axle loads and yet free from vertically acting and horizontally acting vibrations and shocks.

The known deflecting devices in which the spring point is positioned in the direction of the point of the frog can be negotiated only up to a specific speed in the track branching-off. If it is intended to increase the speed, difficulties will result with regard to the construction of this type of deflecting device inasmuch as, for reasons pertaining to the traveling safety, the radius must be large. This, in turn, requires a long thin tongue point. Such a tongue point having a length greater than approximately **14** meters is expensive to manufacture and is subjected to a high degree of wear and tear as a result of the high speeds, great axial loads and great guiding forces. Furthermore, only at considerable expense is it possible to change over such a long tongue with the heretofore known apparatus in a manner such that the desired radius is produced. Both of these disadvantages, i.e., the high degree of wear and tear and an unevenly bent tongue, can lead to an operational hazard at very high speeds and axial loads.

It is known in the art in connection with deflecting devices which are intended to have a large radius in the branched track to provide the two rails of the tracks as tongues in the zone or area of the entrance. These are changed over corresponding to the desired traveling direction. The disadvantage of deflecting devices of this type is that one gap each is open according to the tongue position between the tongue end and the other parts of the switch, in other words, between the continuous rail and straight intermediate rail and, respectively, the bent intermediate rail and the branching-off rail. These gaps result in an unsteady vehicle course and cause high maintenance costs.

The present invention changes over the tongues so that, after the change-over operations, they are uniformly bent or straight and assure that after the change-over the ends of the tongue and of the continuing rails cannot move relative to each other under the traffic load, and continuous running edges will be produced in the gap area or zone.

This is achieved, in accordance with the present invention, by virtue of the fact that the tongues are adapted to be changed over with the aid of – if desired – several pneumatically, hydraulically, or electrically driven tensioning elements against a continuous longitudinal girder, preferably made from metal. The gaps produced between connecting rails and tongues are provided in the two running edge courses so as to be adapted to be locked by means of specifically shaped wedges inserted in the longitudinal direction.

Depending upon the stress, the tongue ends and the beginning of the adjoining rails are made from solid material and are welded to the corresponding rails. In this manner, space is created for the specifically constructed guides which maintain the wedges in the vertical and the horizontal directions.

The bracing of the tongue in the end position thereof is necessary in order to maintain an alignment of the running edge also under the traffic load. The prevention of relative movements of the rail ends on both sides of the gap also may be achieved by virtue of the fact that not only one wedge but a second wedge is inserted per gap, preferably on the side of the rail which is not traveled on.

In order to obtain a vibration-free running of the wheels over the impact or shock area, the wedges are so provided that, in a top plan view thereof, they have the form of a triangle.

The control for the movement of the wedges is suitably electronically linked to the change-over or switching device of the tongues and possibly with that of any existing movable portions of the frog.

The advantage afforded by the present invention resides in that such a construction renders it possible to build deflecting devices for branch rail radii of any desired size, and that these – in contrast to the heretofore known deflecting devices – therefore may be traveled on or negotiated free from shocks and vibrations at very high speeds also in the branch rail.

The invention will be further illustrated hereinafter on the basis of one embodiment thereof, representing a simple deflecting device, and taken with reference to the accompanying drawings, wherein

FIG. **1** is a top plan view of the deflecting device of the present invention;

FIG. **2** is a top plan view of the left half of the deflecting device of the present invention in the position "branch rail";

FIG. **3** is a top plan view of the left half of the deflecting device, but in the position "main rail";

FIG. **4** is a side view of the left half of the deflecting device (FIG. **2**), and

FIG. **5** is a cross-sectional view through the left half of the deflecting device, taken along line A—A, with the tongue position according to FIG. **3**.

The entire deflecting device has been illustrated in FIG. **1** in a distorted scale for reasons of economy of space. In reality, the deflecting device for highest speeds is considerably longer because of the required large radius of the branch rail.

The pneumatic cylinders serving for changing over the tongues, and shown by way of example in FIG. **1**, have been omitted from FIGS. **2** to **4** in the interest of a clearer representation of the details.

The deflecting device of the invention consists of the track rails **1** and **2**, the tongues **3** and **4**, as well as of the connecting rails **5** to **8**. The track rails **1** and **2** as well as the connecting rails **5** to **8** are rigidly connected with the continuous base plate **9** with the aid of known rail attaching means, whereas the tongues **3** and **4** are movably positioned. The spring points **10** and **11** of the tongues **3** and **4** facilitate the horizontal movement particularly of short tongues. The tongue ends **12** and **13** and the rail ends **14, 15, 16** and **17** preferably are made from high-strength solid material and welded to the tongues **3** and **4** and, respectively, to the rails **5** to **8**. The tongues **3** and **4** are switched over in accordance with the desired radius and with the aid of several mechanical, electrical or hydraulic thrust positioning drive means, in this case for example by way of the pneumatic cylinders **18** to **27**. For the purpose of making continuous running edges at the impact gaps **28** to **31** (FIG. **4**) and for the purpose of locking the tongue ends **12** and **13** in their respective end position (FIGS. **2** and **3**), the wedges **32** to **35** are inserted into the recesses **36** and **37** of the tongue ends **12** and **13**, preferably with the aid of the pneumatic cylinders **38** to **41**. For exam-

ple, the guides **42** and **43** and, respectively, **44** and **45** in the tongue end **12** and, respectively, in the end **15** of the connecting rail **6** for the horizontal and vertical position determination of the wedges **32** and **33** have been illustrated in FIGS. **4** and **5**.

It will be obvious to those skilled in the art that many modifications may be made within the scope of the present invention without departing from the spirit thereof, and the invention includes all such modifications.

What is claimed is:

1. A deflecting device for switches which can be negotiated at high speeds free from vibrations and shocks in the branch rail comprising movable tongue means which are sections of the main rails, the free ends of said tongue means having recesses therein extending in the longitudinal direction of the rails, wedge means adapted to be inserted into said recesses in order to close the gaps between said tongue means and connecting rails, and means for moving said wedge means into and out of the closed position.

2. A deflecting device according to claim **1** in which the means for switching the tongue means are mounted between the ends of the deflecting device.

3. A deflecting device according to claim **2** in which the means for switching are double-acting cylinders.

4. A deflecting device according to claim **1** in which the means for moving the wedge means are double-acting cylinders.

5. A deflecting device according to claim **1** in which the wedge means have a triangular shape in top plan view.

6. A deflecting device according to claim **1** including inclined guide path means for said wedge means, whereby automatic locking is effected.

7. A deflecting device according to claim **1** in which the end position of the wedge means is variable, for setting purposes and for compensating for wear and tear.

8. A deflecting device according to claim **1** in which the sliding surfaces of the wedge means are covered with a friction-reducing coating.

9. A deflecting device according to claim **8** in which the coating is perfluoroethylene.

10. A deflecting device according to claim **1** in which the wedge means are fabricated from a high-strength martensite-hardened ductile nickel steel.

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