(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 206 402 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
05.07.2023 Bulletin 2023/27

(21) Application number: **21860177.1**

(22) Date of filing: **13.08.2021**

(51) International Patent Classification (IPC):
E01B 25/10 *(2006.01)* ***E01B 25/12*** *(2006.01)*
E01B 25/22 *(2006.01)* ***E01B 7/00*** *(2006.01)*
E01B 25/26 *(2006.01)*

(86) International application number:
PCT/CN2021/112552

(87) International publication number:
WO 2022/042338 (03.03.2022 Gazette 2022/09)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **31.08.2020 CN 202010893368**

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(54) RAIL TRANSIT TURNOUT SYSTEM

(57) Disclosed in the present invention is a rail transit turnout system. A first end of a turnout beam (5) is provided on a first transition pier column (3) and is rotatably connected to the first transition pier column (3) by means of a center pin (4), and a second end of the turnout beam (5) is provided on a second transition pier column (6) and can travel on the second transition pier column (6); there are at least two branch rail beams (8, 9, 10) and the branch rail beams are fixedly supported by means of multiple branch pier columns (7) arranged at intervals; the first end of the turnout beam (5) abuts against the end of a basic rail beam (1) facing towards the turnout beam (5), and a second end of the turnout beam (5) operatively selects to abut against a first end of a certain branch rail beam (8, 9, 10); second ends of the branch rail beams (8, 9, 10) extend in a direction away from the turnout beam (5). The technical solution of the present invention has a simple and reliable operation, and can effectively shorten the switch time, thereby improving transport efficiency.

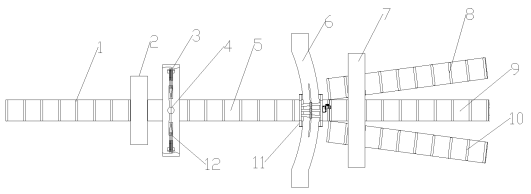

FIG. 1

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the technical field of rail transit systems, and in particular, to a rail transit turnout system.

BACKGROUND OF THE INVENTION

[0002] The suspended monorail system is a kind of in-air rail transportation system. It has the advantages of good compatibility, high safety, high integration, low cost, flexible lines, environment friendly and low noise, etc. It meets the needs of modern urban rail transportation and is widely used in new type urban rail construction of China.

[0003] At present, domestic suspended monorail traffic turnouts are mainly simple turnout. There are two types of multi-way turnout disclosed in practical applications, respectively translational beam replacement type and segmental type. The translational beam replacement type turnout completes line conversion between a straight traveling state and a curve traveling state by parallel movement of a branch rail beam and a curved rail beam. The segmental type turnout consists of a fixed beam, a driving beam and a driven beam, which makes the vehicle travel on a gently folding line approximate to an arc curve by mechanically driving the driving beam and the driven beam to be switched integrally using an electric motor mounted on the driving beam.

[0004] In the suspended rail transit system, the translational beam replacement type multi-way turnout has cumbersome structure, requires high strength of pier column and related mechanisms, and has disadvantages such as requiring high switching power, long switching time, poor in economy. When the segmental type turnout is switched, the turnout beam is a multi-section broken-line beam, and there are many pier column foundations; at the same time, there are high requirement for the precision of the electric motor, and the reliability is poor.

[0005] Therefore, the existing technology needs to be improved.

SUMMARY OF THE INVENTION

[0006] In view of the above-mentioned deficiencies in the prior art, the present disclosure provides a rail transit turnout system to solve the problem that the translational beam replacement type multi-way turnout in the suspended rail transit system has cumbersome structure, requires high strength of pier column and related mechanisms, and has disadvantages such as requiring high switching power, long switching time, poor in economy and the problem that the turnout beam is a multi-section broken-line beam when the segmental type turnout is switched, and there are many pier column foundations; at the same time, there are high requirement for the precision of the electric motor, and the reliability is poor.

[0007] The rail transit turnout system according to the present disclosure is charactered by comprising: a base rail beam fixedly supported by a plurality of base pier columns arranged at intervals; a turnout beam having a first end and a second end opposite to each other, wherein the first end of the turnout beam is provided on a first transition pier column and is rotatably connected to the first transition pier column through a center pin, the center pin is arranged vertically, and the second end of the turnout beam is provided on a second transition pier column and is capable of traveling on the second transition pier column; and branch rail beams, wherein there are at least two branch rail beams, the branch rail beams are fixedly supported by a plurality of branch pier columns arranged at intervals, each of the branch rail beams has a first end and a second end opposite to each other, the turnout beam is arranged between the base rail beam and the branch rail beams, the first end of the turnout beam docks with an end of the base rail beam facing the turnout beam, the second end of the turnout beam operatively selects to dock with a first end of one branch rail beam among the branch rail beams, and the second end of each branch rail beam extends in a direction away from the turnout beam.

[0008] In some embodiments, the first transition pier column is provided with two compensation assemblies, the two compensation assemblies are oppositely disposed on two sides of the turnout beam, and each compensation assembly includes at least one compensation device, the compensation device has an output part, and the output part of the compensation device is operatively inserted into a gap between the first end of the turnout beam and the end of the base rail beam facing the turnout beam.

[0009] In some embodiments, the compensation device includes a compensation beam, wherein the compensation beam is the output part of the compensation device, and the compensation beam is operatively movable in a direction perpendicular to the base rail beam.

[0010] In some embodiments, the first transition pier column includes two opposite support columns, and an inner side of the support column is provided with a support seat corresponding to the compensation device; the compensation device includes a fixed seat and a driving unit, the fixed seat is fixedly disposed on the corresponding support seat, and a fixed end of the driving unit is fixedly disposed on the fixed seat, an output end of the driving unit is capable of telescopically moving back and forth along a horizontal direction, and the output end of the driving unit is fixedly connected with the compensation beam.

[0011] In some embodiments, the support seat is provided with a guide rail; and the bottom of the compensation beam is provided with a roller wheel, and the roller wheel is rollablely disposed on the guide rail.

[0012] In some embodiments, an inner side of the support column is provided with a guiding plate correspond-

ing to the compensation device, and the bottom of the guiding plate is provided with a slide channel, and the top of the compensation beam is slidably disposed in the slide channel of the corresponding guiding plate.

[0013] In some embodiments, the system further includes a locking device, each compensation device is correspondingly configured with one locking device, and the locking device includes: a positioning seat fixedly disposed on the corresponding compensation beam and provided with a locking hole; a telescopic mechanism fixedly disposed on the first transition pier column; and a positioning pin, wherein the positioning pin has a first end and a second end opposite to each other, the first end of the positioning pin is fixedly connected to an output end of the telescopic mechanism, and the second end of the positioning pin is operatively inserted into the locking hole on the positioning seat.

[0014] In some embodiments, the second end of the turnout beam travels on the second transition pier column using a traveling mechanism, and the traveling mechanism includes: a traveling track, wherein the traveling track is arc-shaped, and a center of the arc-shaped traveling track is located on a central line of the center pin; and a traveling unit, wherein the second end of the turnout beam is connected to the traveling unit, and the traveling unit operatively travels on the traveling track.

[0015] In some embodiments, the traveling unit includes a first side frame and a second side frame arranged opposite to each other, an end of the first side frame and a corresponding end of the second side frame are connected by connecting beams, bottoms of the first side frame and the second side frame are respectively provided with installation grooves, and the second end of the turnout beam is sequentially fixedly connected in the installation grooves at the bottoms of the first side frame and the second side frame.

[0016] In some embodiments, the traveling unit further includes: a plurality of wheel shafts arranged at intervals and configured to connect tops of the first side frame and the second side frame, wherein one of the plurality of the wheel shafts is provided with a drive wheel, and the drive wheel is rollablely disposed on the traveling track; and a drive motor fixedly disposed on an outer side of the second side frame, wherein an output shaft of the drive motor is fixedly connected with the one of the plurality of wheel shafts.

[0017] With the rail transit turnout system provided by the present disclosure, since the first end of the turnout beam docks with the end of the base rail beam facing the turnout beam, the first end of the turnout beam is rotatably disposed on the first transition pier column, and the second end of the turnout beam operatively selects to dock with the first end of a certain branch rail beam, the purpose of switching can be achieved by operating the rotation of the first end of the turnout beam on the first transition pier column.

[0018] Compared with the translational beam replacement type multi-way turnout, the present disclosure adopts a piece of turnout beam as the main body of the turnout, which has a short length and can greatly reduce the mass of the multi-way turnout beam in the prior art, and at the same time the volume and mass of the pier column are reduced and the cost is reduced.

[0019] Compared with the segment type multi-way turnout, the present disclosure has only one broken-line segment, and needs only two transition pier column beams, which has higher reliability and lower cost.

[0020] The rail transit turnout system disclosed in the present disclosure is simple and reliable in operation, can effectively shorten the switching time, improves the transportation efficiency, and has good practical value.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021]

FIG. 1 is a schematic structural diagram of a rail transit turnout system according to an embodiment of the present disclosure.

FIG. 2 is a schematic structural diagram of a compensation assembly in FIG. 1.

FIG. 3 is a schematic diagram showing the arrangement of a locking device of FIG. 2.

FIG. 4 is a schematic assembly diagram of a turnout beam and a traveling mechanism.

FIG. 5 is a schematic structural diagram of a traveling mechanism.

FIG. 6 is a schematic diagram showing a state in which a compensation beam is in a standby position.

FIG. 7 is a schematic diagram showing a state in which the No. 1 compensation beam and the No. 3 compensation beam are in the compensation position.

FIG. 8 is a schematic diagram showing a state in which a turnout beam is switched to a left turn position.

FIG. 9 is a schematic diagram showing a state in which the No. 3 compensation beam and the No. 4 compensation beam are in the compensation position.

FIG. 10 is a schematic diagram of a state in which the turnout beam is switched to the right turn position.

FIG. 11 is a schematic diagram showing a state in which the No. 1 compensation beam and the No. 2 compensation beam are in the compensation position.

DETAILED DESCRIPTION OF THE INVENTION

[0022] FIG. 1 is a schematic structural diagram of a rail transit turnout system according to an embodiment of the present disclosure. With reference to FIG. 1, the system includes a base rail beam 1, a turnout beam 5 and branch rail beams, wherein the base rail beam 1 is fixedly supported by a plurality of base pier column 2 arranged at intervals, and the turnout beam 5 has a first end and a

second end opposite to each other. The first end of the turnout beam 5 is disposed on a first transition pier column 3, and the first end of the turnout beam 5 is rotatably connected to the first transition pier column 3 through a center pin 4 which is arranged vertically. The second end of the turnout beam 5 is disposed on a second transition pier column 6, and the second end of the turnout beam 5 can travel on the second transition pier column 6. There are at least two branch rail beams. The branch rail beams are fixedly supported by a plurality of branch pier columns 7 arranged at intervals, and each branch rail beam has a first end and a second end opposite to each other. The turnout beam 5 is arranged between the base rail beam 1 and the branch rail beams, the first end of the turnout beam 5 docks with an end of the base rail beam 1 facing the turnout beam 5, and the second end of the turnout beam 5 operatively selects to dock with the first end of a certain one of the branch rail beams. The second ends of the branch rail beams extend in a direction away from the turnout beam 5.

[0023] In actual operation, the purpose of switching can be achieved by operating the rotation of the first end of the turnout beam 5 on the first transition pier column 3. Compared with the translational beam replacement type multi-way turnout, the present disclosure adopts a piece of turnout beam as the main body of the turnout, which has a short length and can greatly reduce the mass of the multi-way turnout beam in the prior art, and at the same time the volume and mass of the pier column are reduced and the cost is reduced. Compared with the segmental type multi-way turnout, the present disclosure has only one broken-line segment, and needs only two transition pier column beams, which has higher reliability and lower cost.

[0024] In some embodiments, there can be three branch rail beams, respectively a first branch rail beam 8, a second branch rail beam 9 and a third branch rail beam 10. The first branch rail beam 8 and the third branch rail beam 10 are respectively arranged on two sides of the second branch rail beam 9. The second branch rail beam 9 and the base rail beam 1 are positioned in a same line. The first branch rail beam 8, the second branch rail beam 9 and the third branch rail beam 10 are arranged in a fan shape.

[0025] Referring to FIG. 1, first ends of the plurality of branch rail beams can be fixedly supported by one branch pier column 7.

[0026] In order to adapt to the rotation of the turnout beam, there needs to be a gap between the base rail beam 1 and the turnout beam 5, which is not conducive to the running of a rail vehicle across the base rail beam 1 and the turnout beam 5. In order to solve this problem, the present disclosure provides a compensation assembly.

[0027] FIG. 2 is a schematic structural diagram of the compensation assembly in FIG. 1. Combined with FIG. 2, there are two compensation assemblies disposed on the first transition pier column 3. The two compensation assemblies are oppositely arranged on two sides of the turnout beam 5. Each compensation assembly includes at least one compensation device 12. The compensation device 12 has an output part, and the output part of the compensation device 12 is operatively inserted into the gap between the first end of the turnout beam 5 and the end of the base rail beam 1 facing the turnout beam 5, so that the gap between the base rail beam 1 and the turnout beam 5 can be filled to ensure the reliability of the running of a rail vehicle across the base rail beam 1 and the turnout beam 5.

[0028] Combined with FIG. 2, the compensation device 12 includes a compensation beam 122, which is the output part of the compensation device, and the compensation beam 122 operatively moves in a direction perpendicular to the base rail beam 1.

[0029] Combined with FIG. 2, the first transition pier column 3 may include two opposite support columns 301. An inner side of the support column 301 is provided with a support seat 302 corresponding to the compensation device 12, and the compensation device 12 further includes a fixed seat 302 and a driving unit 125. The fixed seat 302 is secured on a corresponding support seat 302. A fixed end of the driving unit 125 is secured on the fixed seat 302, the output end of the driving unit 125 can be telescopically moved back and forth along a horizontal direction, and the output end of the driving unit 125 is fixedly connected to the compensation beam 122. When the compensation beam 122 needs to compensate the gap between the base rail beam 1 and the turnout beam 5, the output end of the driving unit 125 can drive the compensation beam 122 to move to implement the compensation.

[0030] In some embodiments, there can be two driving units 125 disposed opposite to each other in the horizontal direction, and the two driving units 125 move synchronously to make the compensation beam 122 move in a predetermined direction. The driving unit 125 may be a linear reciprocating motion mechanism such as an electric push rod, a hydraulic cylinder, etc., which is not limited in the present disclosure.

[0031] In some embodiments, combined with FIG. 2, the support seat 302 may be provided with a guide rail, and the bottom of the compensation beam 122 is provided with a roller wheel 128. The roller wheel 128 is rollable and disposed on the guide rail to reduce friction and improve the swiftness of the operation of the compensation beam 122.

[0032] Combined with FIG. 2, in some embodiments, the bottom of the support seat 302 may be provided with a reinforcing plate 303, and the reinforcing plate 303 is connected with the support column 301 on the same side to improve the bearing capacity of the support seat 302.

[0033] Combined with Fig. 2, in some embodiments, the inner side of the support column 301 is provided with a guiding plate 304 corresponding to the compensation device 12. The bottom of the guiding plate 304 is provided with a slide channel, and the top of the compensation

beam 122 is slidably arranged in the slide channel of the corresponding guiding plate 304 to guide the movement of the compensation beam 122.

[0034] Combined with FIG. 2, the first transition pier column 3 also include a top beam 305 connecting the two opposite support columns 301 together, and a connection plate 306 is provided between the top of the guiding plate 304 and the top beam 305 to improve the reliability of installation of the guiding plate 304.

[0035] When the compensation beam 122 is operated to reach the gap between the base rail beam 1 and the turnout beam 5, in order to prevent the compensation beam 122 from returning, each compensation device 12 is provided with one corresponding locking device. Combined with FIG. 2, the locking device includes a positioning seat 126, a telescopic mechanism and a positioning pin 127. The positioning seat 126 is fixedly arranged on the corresponding compensation beam 122. The positioning seat 126 is provided with a locking hole. The telescopic mechanism is fixedly arranged on the first transition pier column 3. The positioning pin 127 has a first end and a second end opposite to each other. The first end of the positioning pin 127 is fixedly connected to the output end of the telescopic mechanism, and the second end of the positioning pin 127 is operatively inserted into the locking hole on the positioning seat 126. After the compensation beam 122 is compensated in place, the telescopic mechanism is operated to move so that the second end of the positioning pin 127 is inserted into the locking hole on the positioning seat 126, and thus the compensation beam 122 can be locked.

[0036] In some embodiments, the positioning seat 126 is preferably arranged at the outer bottom of the compensation beam 122, and preferably there are two locking holes on the positioning seat 126, and the two positioning holes are respectively located on two sides of the compensation beam 122, so that the compensation beam 122 can be locked from two directions to improve the reliability of locking.

[0037] FIG. 3 is a schematic diagram of the arrangement of the locking device in FIG. 2. Combined with FIG. 3, two telescopic mechanisms 1210 are provided inside the support seat 302, and the output ends of the two telescopic mechanisms 1210 are both vertically telescopic. The axial direction of the locking hole on the positioning seat 126 is vertical. By operating the telescopic mechanism, the positioning pin 127 connected to the output end of the telescopic mechanism 1210 can be inserted into the locking hole on the positioning seat 126.

[0038] Of course, the two telescopic mechanisms 1210 can also be arranged on the top of the support seat 302. The telescopic end of the telescopic mechanism 1210 moves in the horizontal direction, and the axial direction of the locking hole on the positioning seat 126 is in the horizontal direction. By operating the telescopic mechanism, the positioning pin 127 connected to the output end of the telescopic mechanism 1210 can be inserted into the locking hole on the positioning seat 126.

[0039] It should be noted that, before the compensation beam 122 is positioned in place, the output end of the telescopic mechanism is in a retracted state, so that the operation of the compensation beam 122 is not affected.

[0040] Combined with FIG. 2, in some embodiments, a support plate 129 is provided on the inner side of the beam 122. The support plate 129 is used to support the traveling wheels of the rail vehicle to pass, and the inner side of the compensation beam 122 above the support plate 129 is used to support a guiding wheel of the rail vehicle to adapt to the smooth passage of the rail vehicle with the guiding wheel.

[0041] Combined with FIG. 1, the second end of the turnout beam 5 travels on the second transition pier column 6 through a traveling mechanism 11. FIG. 4 is a schematic assembly diagram of the turnout beam and the traveling mechanism, and FIG. 5 is a schematic structural diagram of the traveling mechanism. Referring to FIGS. 1, 4 and 5, the traveling mechanism 11 includes a traveling track 117 and a traveling unit. The traveling track 117 is arc-shaped, and a center of the arc-shaped traveling track 117 is located on the center line of the center pin 4. The second end of the turnout beam 5 is connected to the traveling unit. The traveling unit can operatively travel on the traveling track 117, so that the first end of the turnout beam 5 is rotated by a certain angle around the center pin. That makes the turnout beam 5 connect with the branch rail beam of a branch to be guided, and then the key action of switching the turnout beam is completed.

[0042] Combined with FIGS. 4 and 5, the traveling unit includes a first side frame 111 and a second side frame 115 arranged oppositely. An end of the first side frame 111 and a corresponding end of the second side frame 115 are connected by connecting beams 116. There are mounting grooves 118 provided on both sides of the bottom of the first side frame 111 and the second side frame 115, and the second end of the turnout beam 5 are fixedly connected in the mounting grooves 118 at the bottom of the first side frame 111 and the second side frame 115 in turn to realize the assembly of the second end of the turnout beam 5 and the traveling unit.

[0043] The first side frame 111, the second side frame 115 and the connecting beam 11 constituting the traveling unit are preferably integrally formed, so that the traveling unit has sufficient bearing strength.

[0044] Combined with FIG. 5, the traveling unit further includes a drive motor 114 and a plurality of wheel shafts 113. The tops of the first side frame 111 and the top of the second side frame 115 are connected by the plurality of wheel shafts 113 arranged at intervals. One wheel shaft 113 among the plurality of wheel shafts 113 is provided with a drive wheel 119, and the remaining wheel shafts 113 of the plurality of wheel shafts 113 are provided with driven wheels 112. Both the drive wheel 119 and the driven wheels 112 are rollablely arranged on the traveling track 117. The drive motor 114 is fixedly dis-

posed on the outside of the second side frame 115. The output shaft of the drive motor 114 is connected with the wheel shaft 113 on which the drive wheel 119 is mounted, so that the drive motor 114 can drive the wheel shaft 113 on which the drive wheel 119 is mounted to rotate, thereby driving the drive wheel 119 on the wheel shaft 113 to rotate on the traveling track 117 to realize the movement of the traveling unit on the traveling track 117, and the movement of the traveling unit can drive the plurality of driven wheels 112 to roll on the traveling track 117 to balance the movement of the traveling unit.

[0045] In some embodiments, the drive wheel 119 is located on a middle wheel shaft 113 among the plurality of wheel shafts 113, and the way of one drive wheel 119 cooperating with the plurality of driven wheels 112 can simplify the structure and optimize the space.

[0046] It should be noted that, in some embodiments, each wheel shaft may also be provided with multiple wheels, so as to further improve the balance performance of the movement of the traveling unit, and the drive motor can rotate in forward and reverse directions to ensure that the turnout beam swings from side to side around the center rotating device upon switching. Of course, the drive motor is not the only way to drive. Alternatively, an electric push rod can be used to drive, or a slide rail can be mounted on the side of the turnout beam to cooperate with a rotating arm to drive, which is not limited in the present disclosure.

[0047] The working principle of the rail transit turnout system is as follows:

Switching process:

Taking the three-way turnout as an example, it is assumed that an initial position of the turnout beam is a straight position as shown in the state in FIG. 1, and an initial position of the compensation beam is all pulled out of the turnout beam, i.e., in a standby position. The compensation beam enters the gap between the turnout beam 5 and the base rail beam 1 to completely compensate it. At this time, the position of the compensation beam is a compensation position. In this situation, the arrangement of the compensation beam is as shown in FIG 6. Referring to FIG. 6, there are four compensation beams, respectively, No. 1 compensation beam 121, No. 2 compensation beam 122, No. 3 compensation beam 123 and No. 4 compensation beam 124. No. 1 compensation beam 121 and No. 2 compensation beam 122 are a group of compensation beams, and No. 3 compensation beam 123 and No. 4 compensation beam 124 are another group of compensation beams. The two groups of compensation beams are respectively located on two sides of the gap between the turnout beam 5 and the base rail beam 1.

Turnout straight position switching process: receives a straight position switching command → all compensation beams return to the standby position -> the traveling mechanism receives the command and drives the turnout beam to travel on the second transition pier column to make the turnout beam to switch to the straight position → after the turnout beam is switched into position, the No. 1 compensation beam and the No. 3 compensation beam receive a command and be pushed into the compensation position, and the compensation beams form a state shown in FIG. 7 → after they are in place, the corresponding locking device acts to lock the compensation beam, and thus locking the switching → the switching is completed, waiting for the next switching command;

Turnout left turn position switching process: receives a left turn position switching command → all compensation beams return to the standby position -> the traveling mechanism receives the command and drives the turnout beam to travel on the second transition pier column to make the turnout beam to switch to a left turn position, forming a state shown in FIG. 8 → after the turnout beam is switched into position, the No. 3 compensation beam and the No. 4 compensation beam receive a command, and then the No. 3 compensation beam and the No. 4 compensation beam are pushed into the compensation position, and the compensation beam forms a state as shown in FIG. 9 → after they are in place, the corresponding locking device acts to lock the compensation beam, and thus locking the switching → the switching is completed, waiting for the next switching command;

Turnout right turn position switching process: receives a right turn position switching command → all compensation beams return to a standby position → the traveling mechanism receives the command and drives the turnout beam to travel on the second transition pier column to make the turnout beam to switch to a right turn position, forming a state shown in FIG. 10 → after the turnout beam is switched into place, the No. 1 compensation beam and the No. 2 compensation beam receive a command, and then the No. 1 compensation beam and the No. 2 compensation beam are pushed into the compensation position, and the compensation beams form a state as shown in FIG. 11 → after they are in place, the corresponding locking device acts to lock the compensation beam, and thus locking the switching → the switching is completed, waiting for the next switching command.

[0048] In some embodiments, the compensation device, locking device, and traveling mechanism have their own control logic and can act independently, thus having the characteristics of automatic operation.

[0049] To sum up, the rail transit turnout system shown in the present disclosure is simple and reliable in operation, can effectively shorten the switching time, improve the transportation efficiency, and has good practical value.

[0050] The above embodiments are preferred embodiments of the present disclosure, which are only used to

facilitate the description of the present disclosure, and are not intended to limit the present disclosure in any form. Any equivalent embodiments obtained by those skilled in the art by making partial changes or modifications based on the technical contents disclosed in the present disclosure within the scope of the technical features of the present disclosure without departing from the technical features of the present disclosure, still belong to the scope of the technical features of the present disclosure.

Claims

1. A rail transit turnout system, charactered by comprising:

   a base rail beam fixedly supported by a plurality of base pier columns arranged at intervals;
   a turnout beam having a first end and a second end opposite to each other, wherein the first end of the turnout beam is provided on a first transition pier column and is rotatably connected to the first transition pier column through a center pin, the center pin is arranged vertically, and the second end of the turnout beam is provided on a second transition pier column and is capable of traveling on the second transition pier column; and
   branch rail beams, wherein there are at least two branch rail beams, the branch rail beams are fixedly supported by a plurality of branch pier columns arranged at intervals, and each of the branch rail beams has a first end and a second end opposite to each other, the turnout beam is arranged between the base rail beam and the branch rail beams, the first end of the turnout beam docks with an end of the base rail beam facing the turnout beam, the second end of the turnout beam operatively selects to dock with a first end of one branch rail beam among the branch rail beams, and the second end of each branch rail beam extends in a direction away from the turnout beam.

2. The rail transit turnout system according to claim 1, wherein the first transition pier column is provided with two compensation assemblies, the two compensation assemblies are oppositely disposed on two sides of the turnout beam, and each compensation assembly comprises at least one compensation device, the compensation device has an output part, and the output part of the compensation device is operatively inserted into a gap between the first end of the turnout beam and the end of the base rail beam facing the turnout beam.

3. The rail transit turnout system according to claim 2, wherein the compensation device includes a compensation beam, the compensation beam is the output part of the compensation device, and the compensation beam is operatively movable in a direction perpendicular to the base rail beam.

4. The rail transit turnout system according to claim 3, wherein the first transition pier column comprises two opposite support columns, and an inner side of the support column is provided with a support seat corresponding to the compensation device;

   wherein the compensation device comprises a fixed seat and a driving unit, the fixed seat is fixedly disposed on the corresponding support seat, and a fixed end of the driving unit is fixedly disposed on the fixed seat; and
   an output end of the driving unit is capable of telescopically moving back and forth along a horizontal direction, and the output end of the driving unit is fixedly connected with the compensation beam.

5. The rail transit turnout system according to claim 4, wherein the support seat is provided with a guide rail; and
   the bottom of the compensation beam is provided with a roller wheel, and the roller wheel is rollably disposed on the guide rail.

6. The rail transit turnout system according to claim 5, wherein an inner side of the support column is provided with a guiding plate corresponding to the compensation device, and the bottom of the guiding plate is provided with a slide channel; and
   the top of the compensation beam is slidably disposed in the slide channel of the corresponding guiding plate.

7. The rail transit turnout system according to claim 3, wherein the system further comprises a locking device, and each compensation device is correspondingly configured with one locking device, and the locking device comprises:

   a positioning seat fixedly disposed on the corresponding compensation beam and provided with a locking hole;
   a telescopic mechanism fixedly disposed on the first transition pier column;
   a positioning pin, wherein the positioning pin has a first end and a second end opposite to each other, the first end of the positioning pin is fixedly connected to an output end of the telescopic mechanism, and the second end of the positioning pin is operatively inserted into the locking hole on the positioning seat.

8. The rail transit turnout system according to any one of claims 1-7, wherein the second end of the turnout beam travels on the second transition pier column using a traveling mechanism, and the traveling mechanism comprises:

a traveling track, wherein the traveling track is an arc-shaped, and a center of the arc-shaped traveling track is located on a central line of the center pin; and
a traveling unit, wherein the second end of the turnout beam is connected to the traveling unit, and the traveling unit operatively travels on the traveling track.

9. The rail transit turnout system according to claim 8, wherein the traveling unit comprises a first side frame and a second side frame arranged opposite to each other, and an end of the first side frame and a corresponding end of the second side frame are connected by connecting beams, bottoms of the first side frame and the second side frame are respectively provided with installation grooves, and the second end of the turnout beam is sequentially fixedly connected in the installation grooves at the bottoms of the first side frame and the second side frame.

10. The rail transit turnout system according to claim 9, wherein the traveling unit further comprises:

a plurality of wheel shafts arranged at intervals and configured to connect tops of the first side frame and the second side frame, wherein one of the plurality of the wheel shafts is provided with a drive wheel, and the drive wheel is rollablely disposed on the traveling track;
a drive motor fixedly disposed on an outer side of the second side frame, wherein an output shaft of the drive motor is fixedly connected with the one of the plurality of wheel shafts.

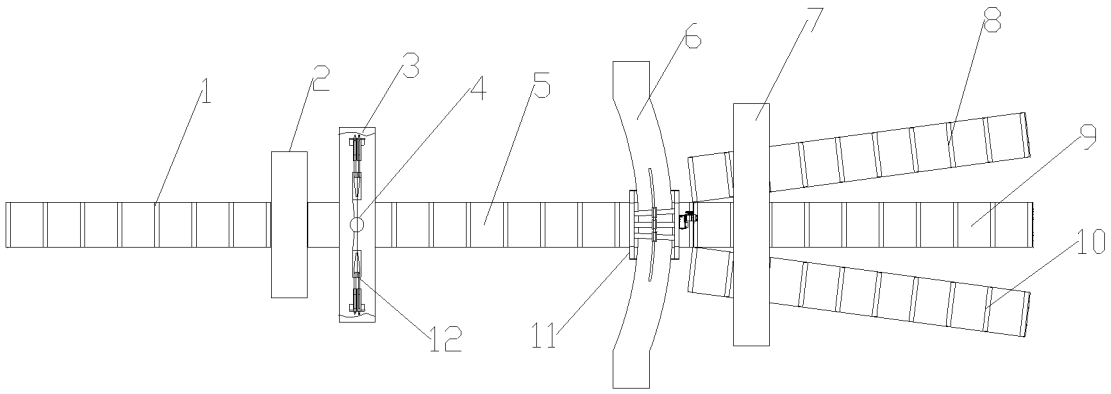

FIG. 1

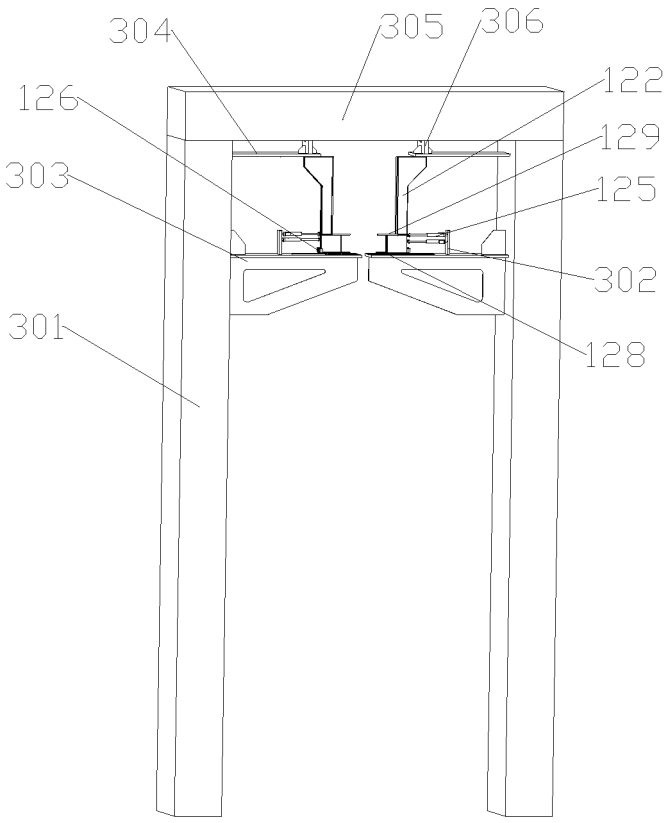

FIG. 2

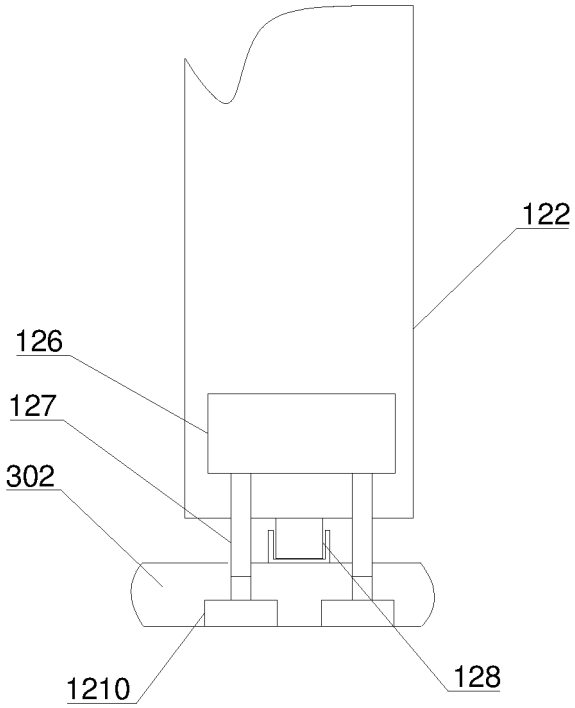

FIG. 3

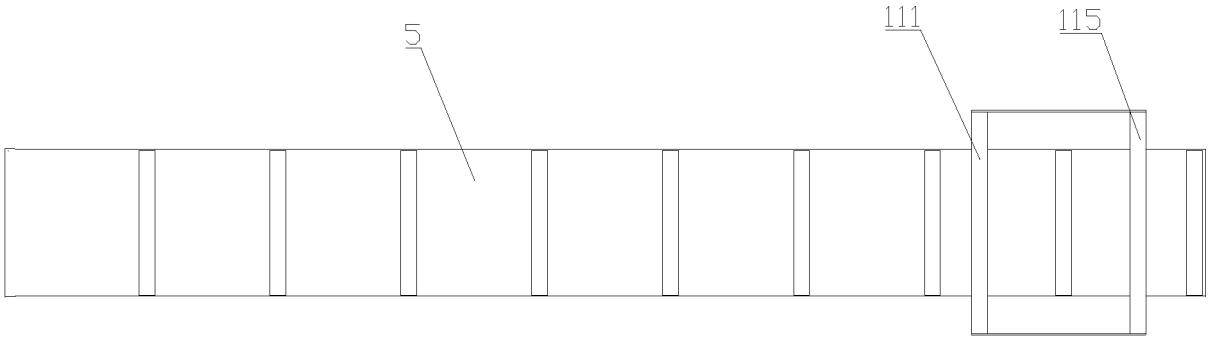

FIG.4

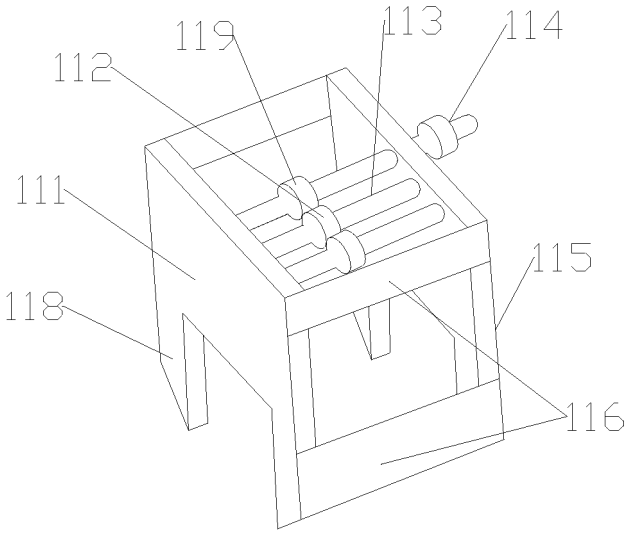

FIG. 5

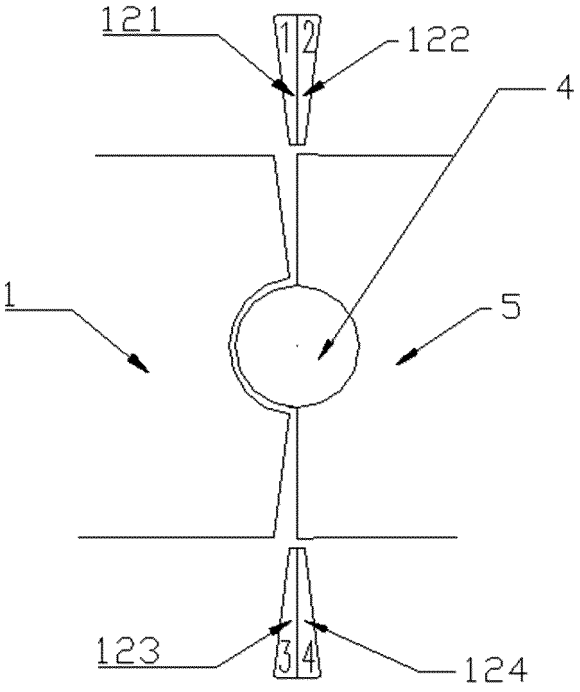

FIG.6

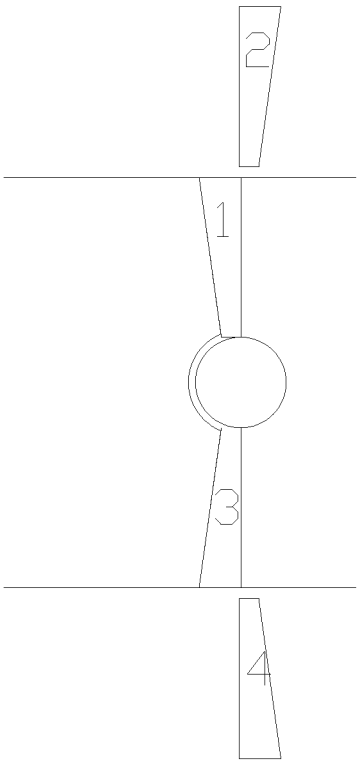

FIG.7

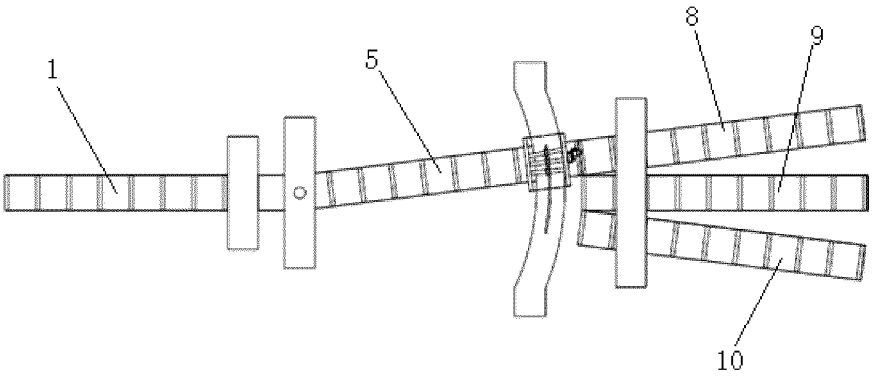

FIG.8

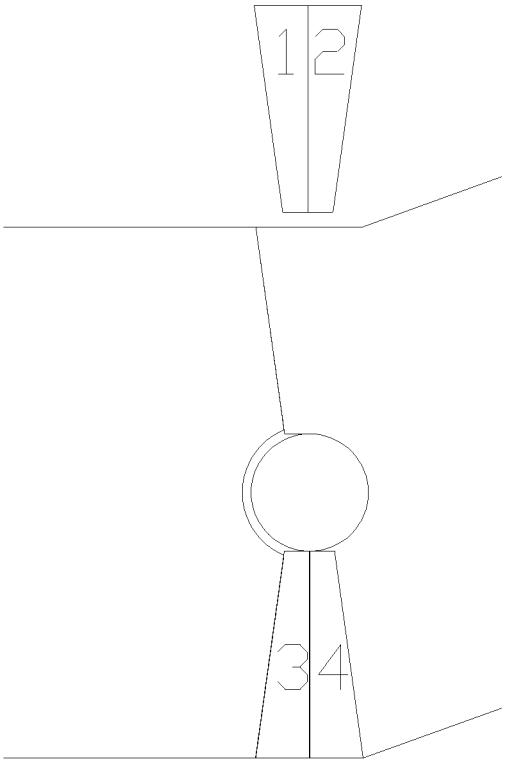

FIG.9

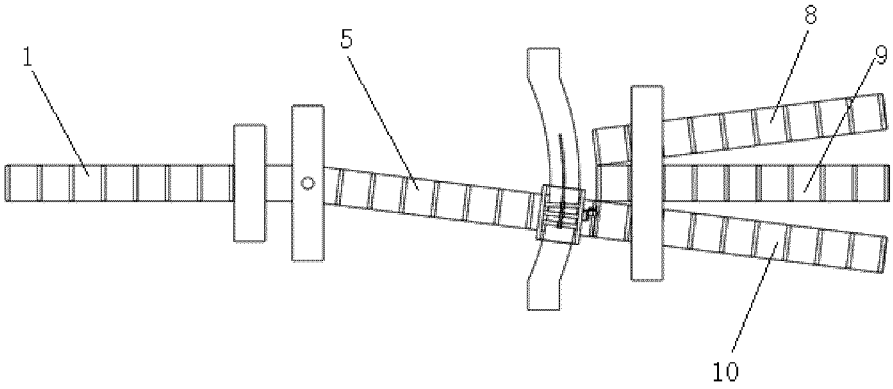

FIG.10

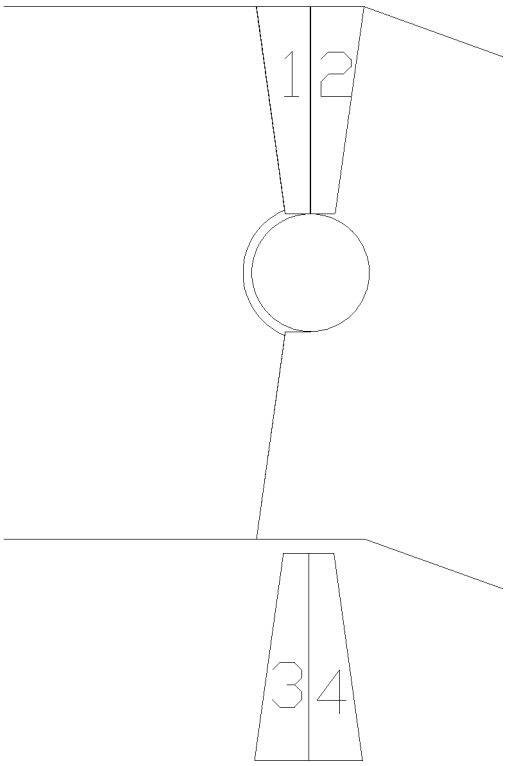

FIG.11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/112552

A. CLASSIFICATION OF SUBJECT MATTER

E01B 25/10(2006.01)i; E01B 25/12(2006.01)i; E01B 25/22(2006.01)i; E01B 7/00(2006.01)i; E01B 25/26(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E01B25; ; E01B7

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI; SIPOABS; CNABS; CNTXT; CNKI: 轨道, 转辙, 转动, 枢转, 空隙, 补偿, 修正, 填补, 间隙, 缺口, 平稳, track, switch, compensation, pivot, space, insert, gap, stable

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 112127217 A (CRRC YANGTZE CO., LTD.) 25 December 2020 (2020-12-25) claims 1-10	1-10
PX	CN 112127218 A (CRRC YANGTZE CO., LTD.) 25 December 2020 (2020-12-25) description, paragraphs [0042]-[0073], and figures 1-11	1-10
X	CN 111139692 A (CHENGDU DEYOU RAIL TRANSIT TECHNOLOGY CO., LTD.) 12 May 2020 (2020-05-12) description, paragraphs [0057]-[0075], and figures 1-20	1
Y	CN 111139692 A (CHENGDU DEYOU RAIL TRANSIT TECHNOLOGY CO., LTD.) 12 May 2020 (2020-05-12) description, paragraphs [0057]-[0075], and figures 1-20	2-10
Y	CN 105040533 A (CHINA RAILWAY ENGINEERING CONSULTATION GROUP CO.,LTD. et al.) 11 November 2015 (2015-11-11) description, paragraphs [0032]-[0062], and figures 1-3	2-7
Y	CN 105951542 A (CHEN, Gang) 21 September 2016 (2016-09-21) description, paragraphs [0043]-[0083], and figures 1-5	4-10

☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 November 2021	**11 November 2021**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** **China**	Authorized officer
Facsimile No. **(86-10)62019451**	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/112552

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 105839482 A (SOUTHWEST PETROLEUM UNIVERSITY) 10 August 2016 (2016-08-10) entire document	1-10
A	CN 111172821 A (CHINA RAILWAY ENGINEERING DESIGN AND CONSULTING GROUP CO., LTD.) 19 May 2020 (2020-05-19) entire document	1-10
A	CN 110714376 A (SHENZHEN KONGTIE TECHNOLOGY CO., LTD.) 21 January 2020 (2020-01-21) entire document	1-10
A	US 5193767 A (HSST KK) 16 March 1993 (1993-03-16) entire document	1-10

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2021/112552

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 112127217 A	25 December 2020	None	
CN 112127218 A	25 December 2020	None	
CN 111139692 A	12 May 2020	None	
CN 105040533 A	11 November 2015	CN 105040533 B	19 April 2017
CN 105951542 A	21 September 2016	CN 105951542 B	03 November 2017
CN 105839482 A	10 August 2016	CN 105839482 B	30 June 2017
CN 111172821 A	19 May 2020	None	
CN 110714376 A	21 January 2020	None	
US 5193767 A	16 March 1993	JP H04111801 A	13 April 1992

Form PCT/ISA/210 (patent family annex) (January 2015)