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(54) **FORKED RAILWAY TRACK SYSTEM**

WEICHE FÜR EISENBAHNSCHIENENSYSTEM

BIFURCATION FERROVIAIRE

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EP 1 183 424 B1

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Description

[0001] This invention relates to a forked railway track system, and in particular to turnouts.

[0002] Conventional railway turnouts, often called points or switches, generally comprise a primary track and two branch tracks. Each rail of the primary track is continuous with a respective rail of each of the branch tracks and is known as a stock rail. The stock rails are thus parallel where they form the primary track and diverge from each other as the branch tracks lead away from the primary track. The other rails of the branch tracks each comprise a switch blade which is laterally shiftable between a first position in which one end of the switch blade contacts the inside edge of one of the stock rails for directing the wheels of a train travelling in a facing direction (that is from the primary track towards the branch tracks) away from the stock rail and onto the switch blade, so leading the train onto the corresponding branch track, and a second position in which the switch blade is displaced from the stock rail to form a flangeway gap for allowing the wheels of a train travelling in a facing direction to remain on the stock rail and travel down the other branch track.

[0003] Conventionally, the two switch blades associated with each branch track move in unison such that only one switch blade may contact a stock rail at any one time to prevent simultaneous selection of both branch tracks. In this way a train travelling in a facing direction can follow only one branch track. The switch blade shifting mechanism may be spring-loaded such that a train travelling in a trailing direction (that is from one of the branch tracks towards the primary track) can automatically reset the switch blades to allow it through the turnout. As the train approaches the turnout on one of the branch tracks with the switch blades set to the other branch track, the gauge of the rails decreases due to the displacement of the switch blade on which the train is rolling. The wheel flanges on one side therefore urge the switch blade away from its displaced position and into contact with the stock rail against the force of the spring-loaded mechanism to allow the train through the turnout.

[0004] Switch blades are made from rails which are cut to appropriate length and machined to a taper along a large proportion of length to form a very narrow blade at its end where it contacts the stock rail, otherwise known as its toe. In this way, when seated snugly against the stock rail, the switch blade does not bring the gauge of the track out of tolerance. For high speed railway applications, the radius of curvature of track at a turnout must be relatively large to keep lateral forces exerted by the track on the trains down to a level which is comfortable for passengers. A large radius of curvature requires a long switch blade to allow it to be displaced sufficiently clear of the stock rail to provide an adequate flangeway gap along its entire length. Current standards in UK as issued by Railtrack plc stipulate a minimum flangeway

gap of 41mm to allow wheel flanges of a maximum width of 32.5mm (as used on Eurostar trains) to pass safely through.

[0005] Although conventional turnouts work in a satisfactory manner, the machining operation described above makes them very expensive and time consuming to manufacture. One problem particularly associated with the long switch blades required for high speed applications is that the switch blades themselves, which are necessarily very narrow towards the toe as described above, are flexible and require additional supporting structures to prevent them from flexing wildly both horizontally and vertically when trains pass over, or require train speeds to be limited to ensure safety. They are also susceptible to debris, rubbish and stones getting lodged between the switch blade and stock rail, so preventing the switch blade from seating properly. As a result, if a wheel flange hits the toe of the switch blade, this can have dangerous consequences for trains travelling over the turnout. For this reason Railtrack plc standards stipulate a maximum allowable gap due to intrusive matter between switch blade and stock rail of 3.5mm in a facing direction. This is a tight tolerance which can be hard to ensure in view of the flexibility of long switch blades. It is therefore often necessary to employ several actuators and detectors at various positions along the length of the switch blade to shift it in the required manner without flexing and to signal oncoming trains to stop if the gap tolerance is exceeded. Additional actuators and detectors add to the expense of the system, and maintenance costs associated with keeping the turnout operational and free from debris are also very high.

[0006] A forked railway rail system according to the preamble of claim 1 is described in DE-C-53890. In this system, the wheel flange is supported by plates during wheel transfer between the continuous and the non-continuous rails.

[0007] It is an object to provide a forked railway track system which is simpler and cheaper to manufacture and maintain and more reliable than conventional systems.

[0008] According to the invention there is provided a forked railway track system comprising a primary track and two branch tracks, each branch track providing a continuous pathway with the primary track at their convergent ends, each track comprising a pair of parallel rails, a first stock rail of each branch track being continuous with a respective corresponding rail of the primary track, by the second rail of each branch track being fixed and separated from its respective corresponding rail of the primary track at its convergent end to form a flangeway gap between the second rail and the stock rail of the other branch track, characterised in that the flangeway gap is sufficiently narrow that during wheel transfer between a stock rail and a second rail, part of the wheel tread is positioned simultaneously over the stock rail and the second rail.

[0009] By providing fixed rails for the branch tracks with one of the rails being separated from a respective corre-

sponding rail of the primary track at its convergent end to form a flangeway gap between it and the stock rail of the other branch track, it is possible for rail traffic to travel onto the primary track from either branch track without the need for shiftable switch blades. Although the rail which is separated from the primary track rail still needs to be machined down to a narrow blade at its toe, the expense associated with manufacturing actuators, linkages and detectors and their associated maintenance costs may thus be obviated without the need to impose restrictive speed limits for tracks with turnouts which support rail traffic in a trailing mode only. Furthermore, in the absence of shiftable switch blades, the problem of intrusive matter getting lodged between switch blade and stock rail is completely removed.

[0010] According to another aspect of the invention, a check rail is fitted adjacent to a rail of the primary track in the vicinity of and on the same side as the flangeway gap through which the wheels of a train traveling in a facing direction are intended to pass, the check rail acting on the flange-backs of the wheels on one side of the train to guide them through the flangeway gap and to guide the train down the corresponding branch track.

[0011] By providing a passive check rail in the manner described, it has been found that a train traveling in a facing direction can be directed onto a predetermined branch track by virtue of the effect of the check rail acting on the wheel flange-back, again without the need for shiftable switch blades and while still allowing rail traffic traveling in a trailing mode to pass onto the primary track from either branch track. In this way a forked railway track system with no moving parts can be used for rail traffic traveling in both trailing and facing modes. Although an additional check rail is required, it does not require any special machining operations, and so is relatively cheap and easy to manufacture, and requires minimal maintenance.

[0012] Preferably, the check rail is moveable between a first position in which it acts on the flange-backs of the wheels on one side of a train traveling in a facing direction to guide them through the flangeway gap and so guide the train down the corresponding branch track, and a second position in which it is ineffective, to allow the wheels of trains traveling in a trailing direction from the other branch track to pass.

[0013] By providing a movable check rail in the manner described, the direction of rail traffic traveling in a facing direction may be more positively controlled. Furthermore, by providing a movable check rail adjacent to both rails of the primary track, it is possible to selectively control the path of the wheels on a respective side of a train to direct the train onto a corresponding branch track. Although the check rail is moveable, it is not subject to the problems of flexing associated with shiftable switch blades since the check rail need not be machined down to a narrow profile and in any case the check rail plays no part in supporting the weight of rail traffic.

[0014] The check rail may be laterally rotationally or

vertically movable or a combination of these.

[0015] Suitably, the stock rails comprise non-grooved rails. Non-grooved rails are typically used for high speed rail systems, for which the railway track system according to the invention is particularly well suited for the reasons stated above.

[0016] According to another aspect of the invention, there is provided a toy railway comprising the forked railway track system.

[0017] The invention will now be further described by way of example with reference to the accompanying figures in which:

Figure 1 is a plan view of a forked railway track system according to the invention for use in a trailing mode;

Figures 2 and 3 are plan views of a forked railway track system according to a second embodiment of the invention for use in both trailing and facing modes and set to respective branch tracks; and

Figure 4 is a plan view of a forked railway track system according to another embodiment of the invention for use in both trailing and facing modes.

[0018] Figure 1 shows a passive forked railway track system according to a first aspect of the invention comprising a railway turnout for use on a line bearing traffic in a trailing direction only as shown by the arrow, and having a primary track 1 and two branch tracks 3, 5. Each rail 7, 8 of the primary track is continuous with a respective corresponding rail 10, 12 of each of the branch tracks, otherwise known as a stock rail. The stock rails 10, 12 diverge from each other as the branch tracks 3, 5 lead away from the primary track 1. The other non-continuous rails 11, 13 of the branch tracks 3, 5 are fixed and separated from the respective corresponding stock rails 12, 10 of the other branch tracks at their convergent ends by a predetermined minimum distance, for example 41mm, to form flangeway gaps 15, 16. As with conventional switch blades, the non-continuous rails 11, 13 are each machined down to a narrow blade at their toes to enable a smooth transition as the wheels of a vehicle pass from one rail to another. However, unlike conventional switch blades, the rails 11, 13 are static.

[0019] Two check rails 18, 19 are fixed more or less parallel to the inner sides of the non-continuous rails 13, 11 and the rails 7, 8 of the primary track, forming a flangeway gap of a predetermined minimum size, for example 38mm or 41mm. The check rails 18, 19 extend from the vicinity of the toes of the non-continuous rails 13, 11 to a position along the primary track 1 remote from the branch tracks 3, 5.

[0020] Use of the system will now be described with reference to a train approaching from one of the branch tracks 3. As the train approaches the turnout, the wheels of a first side roll on the stock rail 10, with the wheels of the second side on the non-continuous rail 11. As the wheels of the second side approach the toe of the

non-continuous rail 11, the wheel treads, which are considerably wider than the flangeway gap 15, progressively roll over the flangeway gap as the rail 11 narrows, while the wheel flange-backs are acted on by the check rail 19 to steady the wheels and ensure correct alignment. At the same time, the flanges of the corresponding wheels on the first side pass through the flangeway gap 16 between the stock rail 10 and the non-continuous rail 13 of the other branch track 5. Further passage of the wheels through the turnout causes part of the wheel treads of the second side to be positioned over the stock rail 12 before rolling off the end of the non-continuous rail 11 to be supported entirely by the stock rail 12 (which is now the primary track rail 8). During passage of the wheels through the turnout the check rail 19 continues to act on the flange-backs to prevent wheel wobble. Simultaneously, the wheels of the first side clear the flangeway gap 16, and the train passes from the branch track 3 onto the primary track 1.

[0021] Passage of a train from the other branch track 5 onto the primary track 1 occurs in the same manner. As the train approaches the turnout, the wheels of a first side roll on the stock rail 12, with the wheels of the second side on the non-continuous rail 13. As the wheels of the second side approach the toe of the non-continuous rail 13, the wheel treads progressively roll over the flangeway gap 16 as the rail 13 narrows, while the wheel flange-backs are acted on by the check rail 18 to steady the wheels and ensure correct alignment. At the same time, the flanges of the corresponding wheels on the first side pass through the flangeway gap 15 between the stock rail 12 and the non-continuous rail 11 of the other branch track 3. Further passage of the wheels through the turnout causes part of the wheel treads of the second side to be positioned over the stock rail 10 before rolling off the end of the non-continuous rail 13 to be supported entirely by the stock rail 10 (which is now the primary track rail 7). During passage of the wheels through the turnout the check rail 18 continues to act on the flange-backs to prevent wheel wobble. Simultaneously, the wheels of the first side clear the flangeway gap 15, and the train passes from the branch track 5 onto the primary track 1.

[0022] In this way, each branch track 3, 5 provides a continuous pathway with the primary track 1 at their convergent ends. Although check rails 18, 19 are present in the system shown in Figure 1 to help stabilise the wheels as they pass through the turnout, they are not essential to the operation of the system.

[0023] Figures 2 and 3 show an active forked railway track system according to a second aspect of the invention comprising a railway turnout for use on a line bearing traffic in both trailing and facing directions. The same reference numerals are used as in Figure 1 to denote common elements, and reference is made to their description above. The system shown in Figures 2 and 3 differs from that shown in Figure 1 in that the fixed static check rails of Figure 1 have been replaced with check

rails 28, 29, which, like the check rails 18, 19 of Figure 1, are positioned more or less parallel to the inner sides of the non-continuous rails 13, 11 and the rails 7, 8 of the primary track. However, unlike the check rails of Figure 1, the check rails 28, 29 each comprise a fixed length 30, 31 extending from a position remote from the branch track in a direction towards the turnout, but stopping short of the turnout, and providing a flangeway gap of a predetermined minimum size, for example 38mm, between it and its adjacent rail, and a moveable length 32, 33 extending from the end of the fixed length nearest the turnout to a position in the vicinity of the toes of the non-continuous rails 13, 11. The moveable length 32, 33 is provided with a pivot 35, 36 where it joins with the fixed length 30, 31 to allow lateral movement of the moveable length between a first position in which the flangeway gap between it and the stock rail 7, 8 is reduced to the minimum of 38mm and the end of the check rail contacts the inside edge of the toe of the non-continuous rail 13, 11, and a second position in which the check rail is displaced such that the flangeway gap between it and the stock rail 7, 8 is enlarged and the end of the check rail is displaced from the toe of the non-continuous rail 13, 11 to open a flangeway gap of at least 38mm therebetween. An actuator is provided (not shown) to move the check rails accordingly.

[0024] When used in a trailing mode only, both check rails 28, 29 are displaced and the turnout operates in the same manner as the turnout described above with reference to Figure 1.

[0025] When used in a facing mode for a train intended to travel down the right hand branch track 5 as viewed from a train approaching the turnout, the check rail 33 on the right side of the track is moved into contact with the toe of the non-continuous rail 11 as shown in Figure 2 to reduce the flangeway gap between it and the stock rail 8 to the minimum of 38mm or 41mm. As the wheels on the right side of the train approach the turnout, the wheel flange-backs are acted on by the check rail 33 to steady and align them correctly. On approaching the toe of the non-continuous rail 11, the right wheel flanges are urged positively towards the stock rail 8 by the action of the check rail on the flange-backs, while the wheel flanges on the other side of the train are able to drift away from the other stock rail 7 due to the enlargement of the flangeway gap between it and the displaced moveable length of check rail 32 on the left side. In this way, the wheels on the left side roll onto the toe of the non-continuous rail 13 and the train passes onto the branch track 5.

[0026] Figure 3 shows the configuration of the moveable lengths 32, 33 of the check rails required to send a train travelling in a facing direction down the left branch track 3. The principle of operation is similar to that described with reference to Figure 2. This time the left check rail 32 is moved into contact with the toe of the non-continuous rail 13, and acts on the wheel flange-backs of the left side of the train to urge them towards the left stock rail 7, while the wheel flanges on the other side of the

train are able to drift away from the other stock rail 8 due to the enlargement of the flangeway gap between it and the displaced moveable length of check rail 33 on the right side. Thus, the wheels on the right side roll onto the toe of the non-continuous rail 11 and the train passes onto the branch track 3.

[0027] Although in Figures 2 and 3 the end of the check rails 32, 33 can contact the toes of the non-continuous rails 13, 11 to effectively close the flangeway path therebetween and prevent the wheels on the relevant side from passing onto the non-continuous rail 13, 11, the path of the wheels is actually governed by the action of the relevant check rail 32, 33 on the wheel flange-backs, and it is not necessary for the check rails to actually contact the toes in this way. In fact, the check rails could be modified to terminate short of the toes of the non-continuous rails 11, 13 by raising the check rails by an appropriate amount above the level of the stock rails 8, 7. In this way, even after the contact point of a wheel has passed beyond the check rails, the wheel can continue to be influenced by the action of the raised check rail on the flange-back to urge the flange towards the relevant stock rail until such time as the contact point of the corresponding wheel on the other side has passed onto the toe of the non-continuous rail 11, 13, and the wheel is safely on the branch track.

[0028] Figure 4 shows a forked railway track system similar to that shown in Figure 1, but incorporating an active element. The railway turnout is for use on a line bearing traffic in both trailing and facing directions, and incorporates a moveable check rail in the form of a guide block 50 located between the static check rail 19 and the toe of the non-continuous rail 11. In a raised position, the guide block presents a side which acts as an extension to the check rail 19 extending parallel to the stock rail 8 and effectively closing the flangeway gap between the check rail 19 and the non-continuous rail 11. In its lowered position the guide block is completely ineffective.

[0029] When subject to traffic approaching in a trailing direction, the guide block 50 adopts its lowered position, and the turnout functions in the same way as that described with reference to Figure 1.

[0030] When traffic approaches in a facing direction, the guide block 50 is raised. As the wheels on the right side of a train pass the guide block 50, the flange-backs are acted on by the block to urge the flanges towards the stock rail 8, while the wheel flanges on the other side of the train drift away from the other stock rail 7 due to some enlargement of the flangeway gap as the check rail 18 on the other side tapers towards the inner side of the non-continuous rail 13. Thus, the action of the block 50 on the wheel flange-backs on the right side serves to direct the wheels on the left side away from the stock rail 7 and onto the toe of the non-continuous rail 13. Furthermore, the physical presence of the block within the flangeway gap between the check rail 19 and the non-continuous rail 11 prevents the wheels from passing through.

[0031] In practice, it may be necessary to take advan-

tage of the allowable tolerances in track gauge in order to obtain sufficient movement of the wheel flanges away from the stock rails to enable the wheels to roll from the stock rails onto the non-continuous rails and vice versa. Hence, it may be necessary to employ a wide-to-gauge section of primary track around the position of convergence of the non-continuous rails with the stock rails. Likewise, the branch tracks may be required to be narrow-to-gauge around the toe of the continuous rails. Such requirements will be evident to those skilled in the art of railway design.

[0032] As discussed above, current specifications for switched blade turnouts require a maximum 3.5mm gap between a closed switch blade toe and the check rail. Of course, in the system of the invention the rails are all fixed, and a flangeway gap is required between the continuous rails and the tapered ends of the non-continuous branch rails. The check rail which is operative holds the wheel back-flange against the continuous rail throughout the transfer of the wheels, in the facing direction, from the primary track to the selected branch track. There is no risk of a wheel striking the toe of either of the non-continuous branch rails.

[0033] Although not described above, the check rails of the invention may be provided with a renewable contact face, so as to reduce the maintenance costs for the system. The surface of the check rail which acts to urge the wheel back-flange against the fixed continuous rail is of course subject to greatest wear and may therefore be provided with this replaceable face section. Furthermore, the check rails may include a shock resistant feature which uses a resilient material, in order to absorb mechanical shock arising during wheel transfer between rails. This resilient material may also be provided as a replaceable part of the check rail which can be replaced during maintenance.

[0034] The invention is described herein with reference to Figures 1 to 4 by way of example only. It will be clear that the invention extends to further modifications not described.

[0035] For example, the specific examples above describe movement of the check rails as a pivoting lateral movement or else as a vertical movement a guide block. In fact any mechanical arrangement may be used which acts to reduce the flangeway gap between the check rail and the stock rail on one side of the track. For example, the check rail or a guide block may rotate about an axis parallel to the track length into or out of position. A mechanical coupling preferably ensures that the check rail on one side only is in position at any one time, although a control system may instead provide this function, which then controls the movement of the check rails (or guide blocks) independently.

[0036] The minimum flangeway gap between the check rail and the stock rail will be selected according to the particular rail system. The possible minimum gaps of 38mm or 41mm given above are by way of example only. The minimum gap between the check rail and the stock

rail may be less than the minimum gap between the convergent ends of the branch tracks.

[0037] The railway track system according to the invention is particularly suited to high speed applications, in which the stock rails are non-grooved rails, such as UIC60 flat bottom rails.

Claims

1. Forked railway track system comprising a primary track (1) and two branch tracks (3, 5), each branch track providing a continuous pathway with the primary track at their convergent ends, each track comprising a pair of parallel rails, a first stock rail (10, 12) of each branch track being continuous with a respective corresponding rail (7, 8) of the primary track, the second rail (11, 13) of each branch track being fixed and separated from its respective corresponding rail of the primary track at its convergent end to form a flangeway gap (15, 16) between the second rail and the stock rail of the other branch track, **characterised in that** the flangeway gap (15, 16) is sufficiently narrow that during wheel transfer between a stock rail and a second rail, part of the wheel tread is positioned simultaneously over the stock rail and the second rail.
2. Forked railway track system according to claim 1, further comprising a check rail (18, 19; 32, 33) fitted adjacent to a rail of the primary track (1) in the vicinity of and on the same side as the flangeway gap (15, 16) through which the wheels of a train traveling in a facing direction are intended to pass, the check rail acting on the flange-backs of the wheels on one side of the train to guide them through the flangeway gap and to guide the train down the corresponding branch track.
3. Forked railway track system according to claim 2, wherein the check rail (32, 33) is moveable between a first position in which it acts on the flange-backs of the wheels on one side of a train traveling in a facing direction to guide them through the flangeway gap and so guide the train down the corresponding branch track, and a second position in which it is ineffective, to allow the wheels of trains traveling in a trailing direction from the other branch track to pass.
4. Forked railway track system according to claim 3, wherein the check rail (32, 33) is laterally movable.
5. Forked railway track system according to claim 3, wherein the check rail (32, 33) is vertically movable.
6. Forked railway track system according to claim 3, wherein the check rail (32, 33) is rotationally movable.

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7. Forked railway system according to claim 3, wherein the check rail in the first position guides the flange-backs of the wheels on one side through the flangeway gap beyond the point of wheel transfer from the primary track to the branch track.
8. Forked railway system as claimed in any one of claims 3 to 7, in which the check rails have a renewable contact face.
9. Forked railway system as claimed in any one of claims 3 to 8, in which the check rails have a shock resistance portion.
10. Forked railway track system according to any preceding claim, wherein the stock rails comprise non-grooved rails.
11. Toy railway comprising a forked railway track system according to any preceding claim.

Patentansprüche

1. Gegabeltes Eisenbahnspurssystem, das eine primäre Spur (1) und zwei Verzweigungsspuren (3, 5) aufweist, wobei jede Verzweigungsspur einen kontinuierlichen Weg innerhalb der primären Spur bei den konvergierenden Enden derselben bereitstellt, wobei jede Spur ein Paar von parallelen Schienen aufweist, wobei eine erste Backenschiene (10, 12) jeder Verzweigungsspur kontinuierlich mit einer jeweiligen entsprechenden Schiene (7, 8) der primären Spur ist, wobei die zweite Schiene (11, 13) jeder Verzweigungsspur fest und von der jeweiligen entsprechenden Schiene der primären Spur an dem konvergierenden Ende derselben getrennt ist, um einen Spurrillenzwischenraum (15, 16) zwischen der zweiten Schiene und der Backenschiene der anderen Verzweigungsspur zu bilden, **dadurch gekennzeichnet, dass** der Spurrillenzwischenraum (15, 16) ausreichend schmal ist, damit während eines Radtransfers zwischen einer Backenschiene und einer zweiten Schiene ein Teil der Radlauffläche gleichzeitig über der Backenschiene und der zweiten Schiene positioniert ist.
2. Gegabeltes Eisenbahnspurssystem gemäß Anspruch 1, das ferner eine Leitschiene (18, 19; 32, 33) aufweist, die benachbart zu einer Schiene der primären Spur (1) in der Nähe des Spurrillenzwischenraums (15, 16) und auf der gleichen Seite wie derselbe gepasst ist, durch den die Räder eines Zugs, der sich in eine Vorwärtsrichtung bewegt, laufen sollen, wobei die Leitschiene auf die Flanschrücken der Räder an einer Seite des Zugs wirken, um

dieselben durch den Spurrillenzwischenraum zu führen und den Zug die entsprechende Verzweigungsspur entlang zu führen.

3. Gegabeltes Eisenbahnsystem gemäß Anspruch 2, bei dem die Leitschiene (32, 33) zwischen einer ersten Stellung, bei der dieselbe auf die Flanschrücken der Räder an einer Seite eines Zugs, der sich in eine Vorwärtsrichtung bewegt, wirkt, um dieselben durch den Spurrillenzwischenraum zu führen und den Zug so die entsprechende Verzweigungsspur entlang zu führen, und einer zweiten Stellung bewegbar ist, bei der dieselbe unwirksam ist, um zu ermöglichen, dass die Räder von Zügen, die sich in eine Rückwärtsrichtung von der anderen Verzweigungsspur bewegen, durchlaufen. 5
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4. Gegabeltes Eisenbahnsystem gemäß Anspruch 3, bei dem die Leitschiene (32, 33) seitlich bewegbar ist. 20
5. Gegabeltes Eisenbahnsystem gemäß Anspruch 3, bei dem die Leitschiene (32, 33) vertikal bewegbar ist. 25
6. Gegabeltes Eisenbahnsystem gemäß Anspruch 3, bei dem die Leitschiene (32, 33) drehbar bewegbar ist.
7. Gegabeltes Eisenbahnsystem gemäß Anspruch 3, bei dem die Leitschiene in der ersten Stellung hinter dem Punkt eines Radtransfers von der primären Spur zu der Verzweigungsspur die Flanschrücken der Räder an einer Seite durch den Spurrillenzwischenraum führt. 30
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8. Gegabeltes Eisenbahnsystem gemäß einem der Ansprüche 3 bis 7, bei dem die Leitschienen eine erneuerbare Kontaktfläche aufweisen. 40
9. Gegabeltes Eisenbahnsystem gemäß einem der Ansprüche 3 bis 8, bei dem die Leitschienen einen Stoßfestigkeitsabschnitt aufweisen.
10. Gegabeltes Eisenbahnsystem gemäß einem der vorhergehenden Ansprüche, bei dem die Bakenschienen ungerillte Schienen aufweisen. 45
11. Spielzeugeisenbahn, die ein gegabeltes Eisenbahnsystem gemäß einem der vorhergehenden Ansprüche aufweist. 50

Revendications

1. Système de voie ferroviaire à bifurcation, comprenant une voie primaire (1) et deux voies ramifiées (3, 5), chaque voie ramifiée présentant un trajet con-

tinu avec la voie primaire à leurs extrémités convergentes, chaque voie comprenant une paire de rails parallèles, un premier rail fixe (10, 12) de chaque voie ramifiée étant continu avec un rail correspondant respectif (7, 8) de la voie primaire, le second rail (11, 13) de chaque voie ramifiée étant fixé et séparé de son rail correspondant respectif de la voie primaire à son extrémité convergente pour former une ornière de passage (15, 16) entre le second rail et le rail fixe de l'autre voie ramifiée, **caractérisé en ce que** l'ornière de passage (15, 16) est suffisamment étroite pour que, pendant le transfert d'une roue entre un rail fixe et un second rail, une partie de la bande de roulement de la roue est positionnée simultanément au-dessus du rail fixe et au-dessus du second rail.

2. Système de voie ferroviaire à bifurcation selon la revendication 1, comprenant en outre un contre-rail (18, 19 ; 32, 33) adjacent à un rail de la voie primaire (1) au voisinage et du même côté que l'ornière de passage (15, 16) à travers laquelle il a prévu que passent les roues d'un train qui circule dans une direction directe, le contre-rail agissant sur les dos de flasques des roues sur un côté du train pour les guider à travers l'ornière de passage et pour guider le train vers la voie ramifiée correspondante.
3. Système de voie ferroviaire à bifurcation selon la revendication 2, dans lequel le contre-rail (32, 33) est mobile entre une première position dans laquelle il agit sur les dos de flasques des roues sur un côté d'un train qui circule dans une direction directe pour les guider à travers l'ornière de passage et guider ainsi le train vers la voie ramifiée correspondante, et une seconde position dans laquelle il est sans effet, pour permettre le passage des roues de trains qui circulent dans une direction de talonnage depuis l'autre voie ramifiée.
4. Système de voie ferroviaire à bifurcation selon la revendication 3, dans lequel le contre-rail (32, 33) est mobile latéralement.
5. Système de voie ferroviaire à bifurcation selon la revendication 3, dans lequel le contre-rail (32, 33) est mobile verticalement.
6. Système de voie ferroviaire à bifurcation selon la revendication 3, dans lequel le contre-rail (32, 33) est mobile en rotation.
7. Système de voie ferroviaire à bifurcation selon la revendication 3, dans lequel le contre-rail dans la première position guide les dos de flasques des roues sur un côté à travers l'ornière de passage au-delà du point du transfert de roues de la voie primaire vers la voie ramifiée.

8. Système de voie ferroviaire à bifurcation selon l'une quelconque des revendications 3 à 7, dans lequel les contre-rails ont une face de contact renouvelable.
9. Système de voie ferroviaire à bifurcation selon l'une quelconque des revendications 3 à 8, dans lequel les contre-rails comprennent une portion de résistance aux chocs. 5
10. Système de voie ferroviaire à bifurcation selon l'une quelconque des revendications précédentes, dans lequel les rails fixes comprennent des rails sans rainures. 10
11. Chemin de fer-jouet comprenant un système de voie ferroviaire à bifurcation selon l'une quelconque des revendications précédentes. 15

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FIG 1

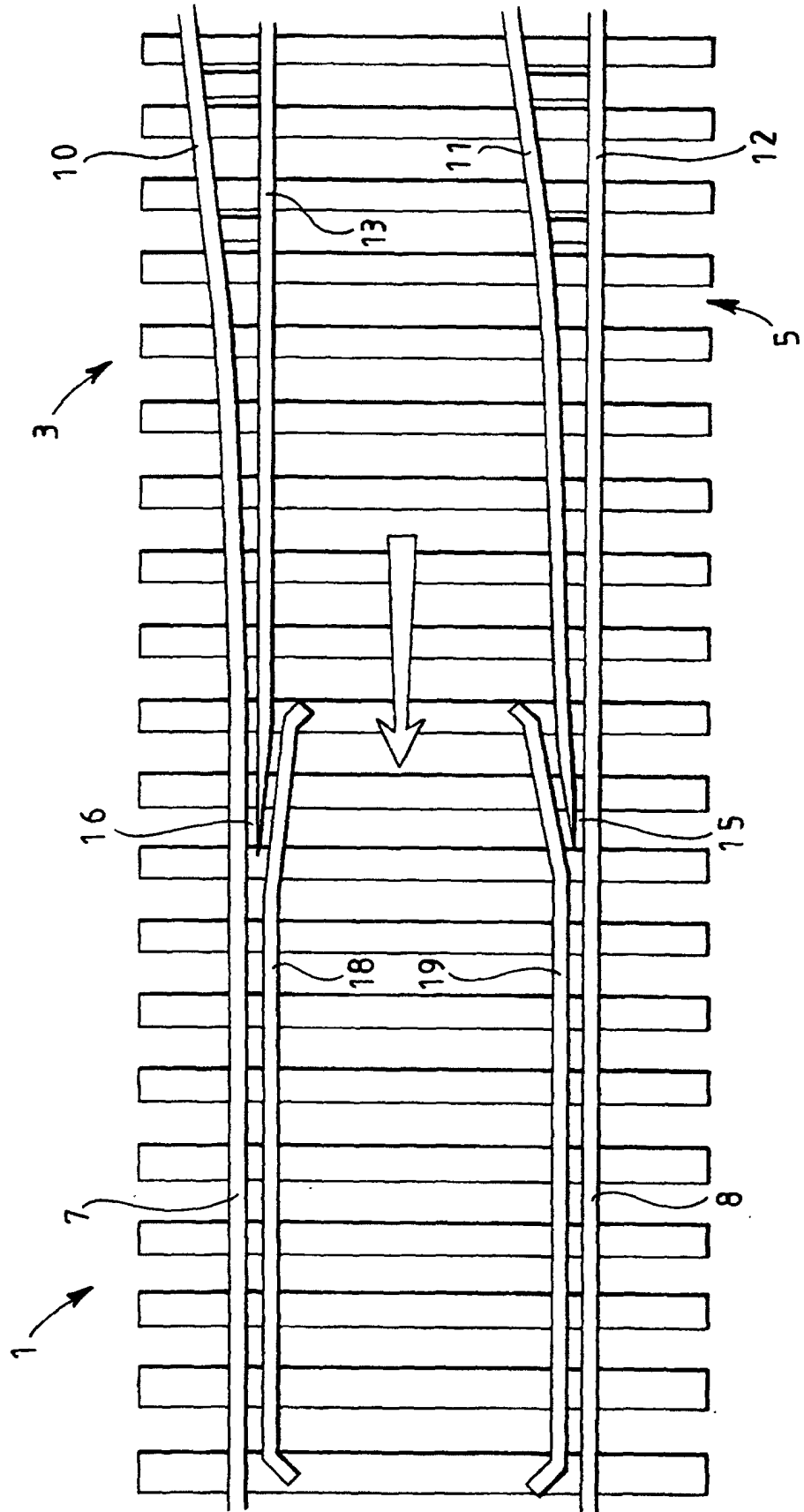


FIG 2

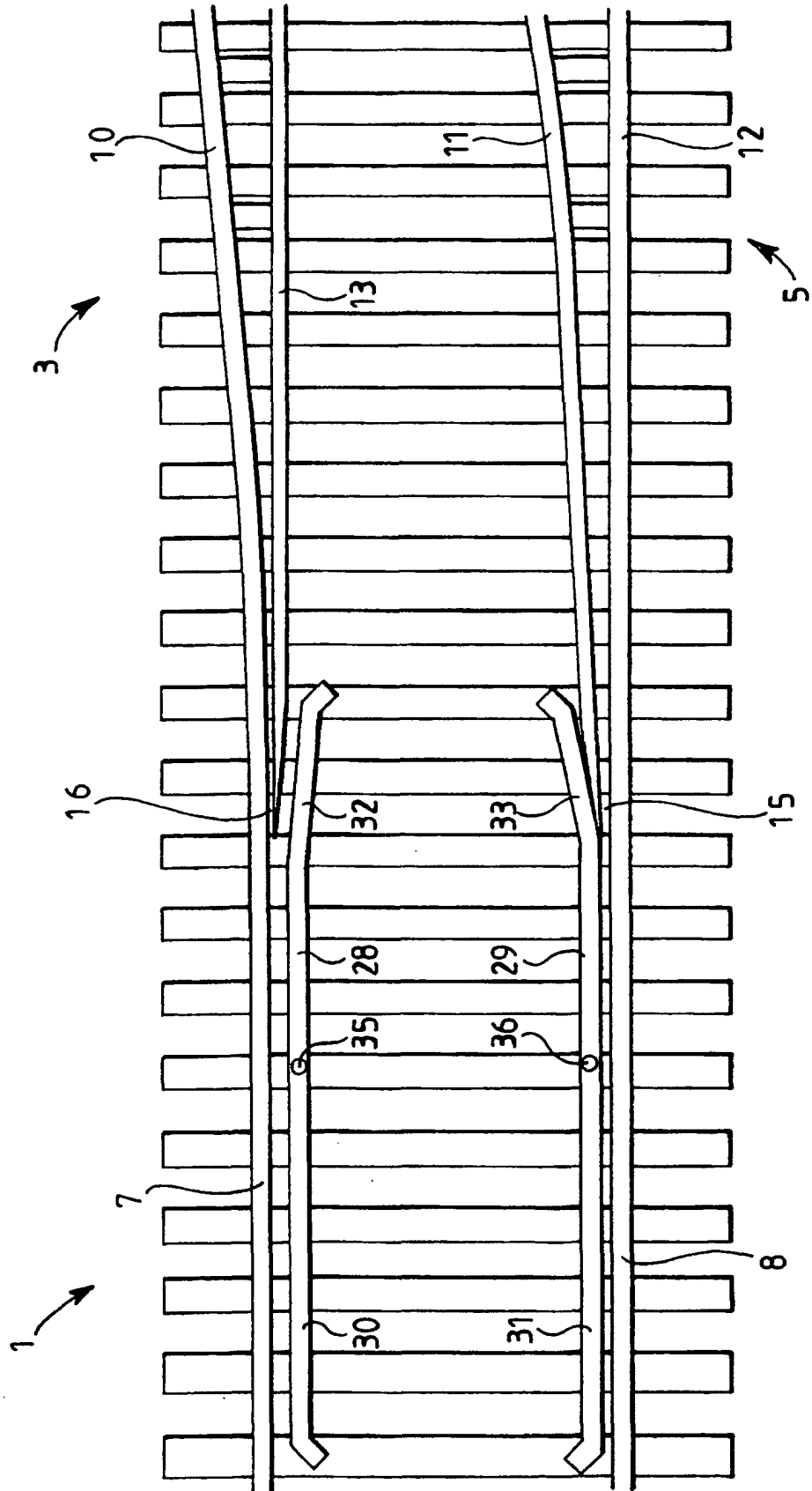


FIG 3

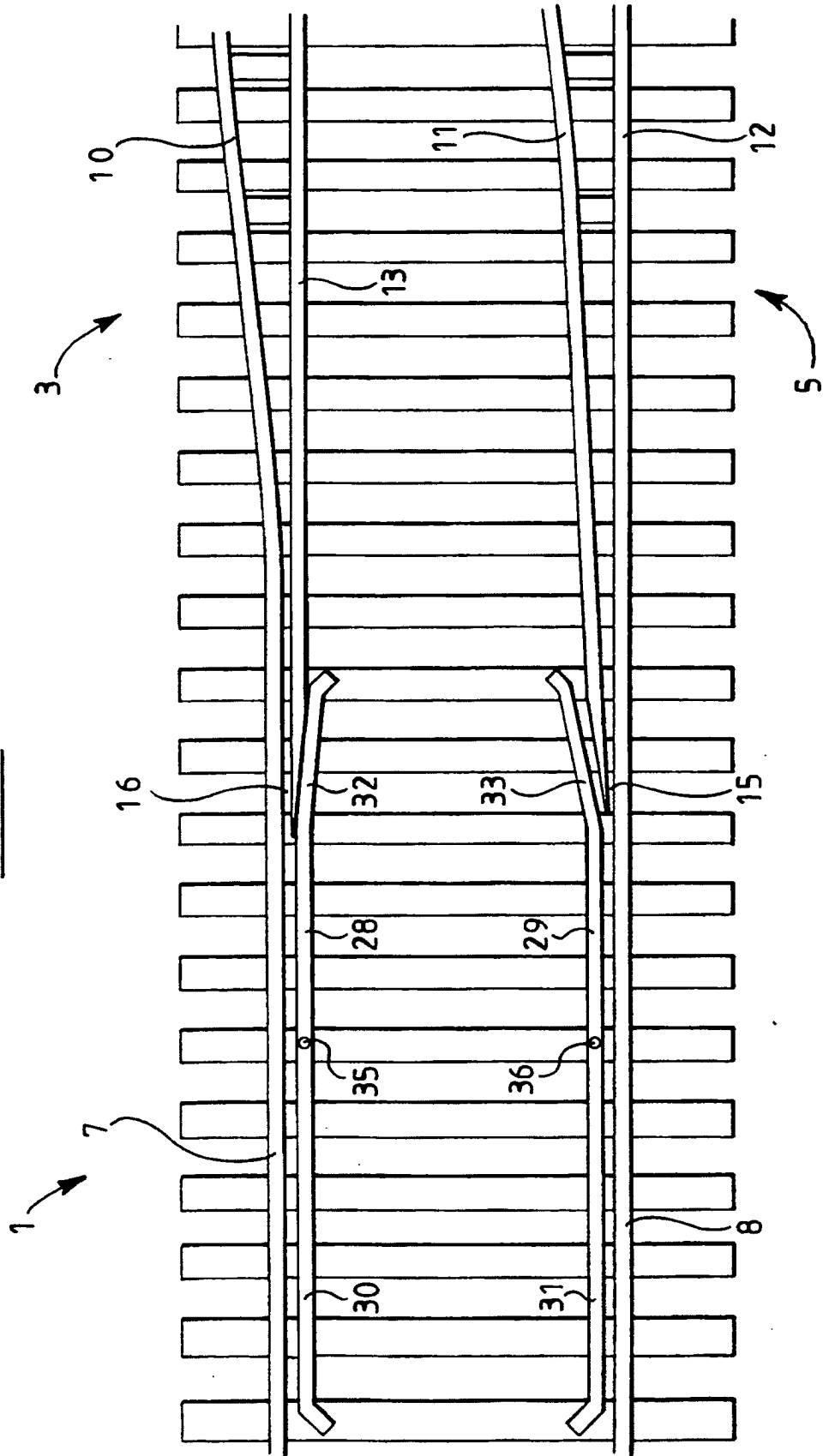


FIG 4

