July 12, 1966 A. E. PYKE 3,260,218

RAILWAY TIE REPOSITIONING APPARATUS

Filed March 20, 1964 2 Sheets-Sheet 1

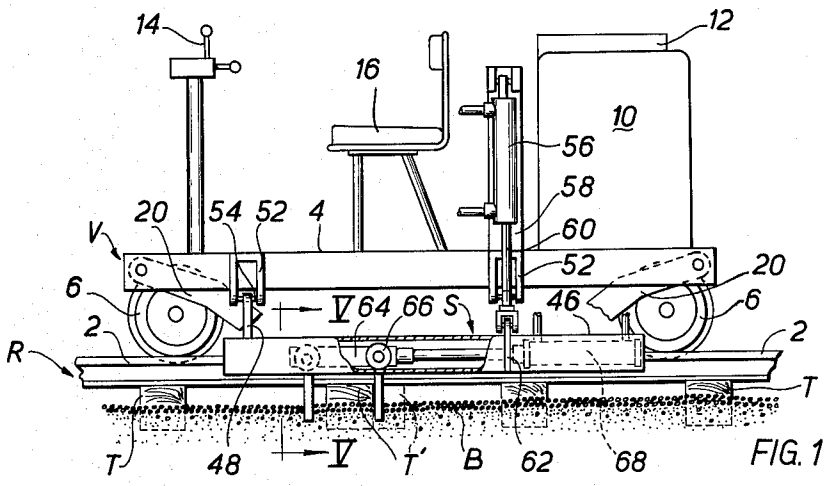



FIG. 1

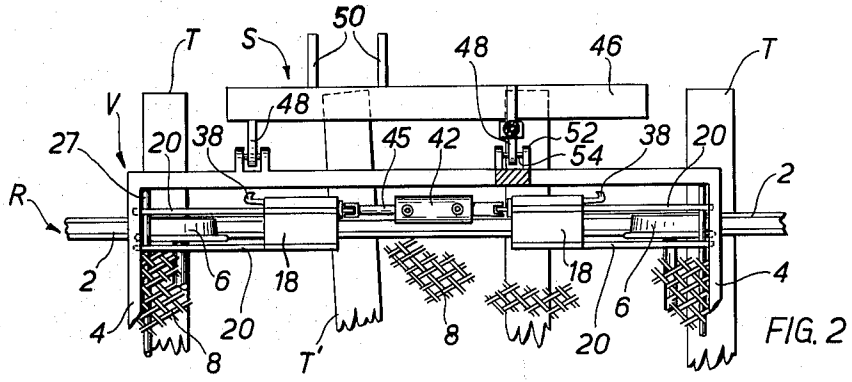



FIG. 2

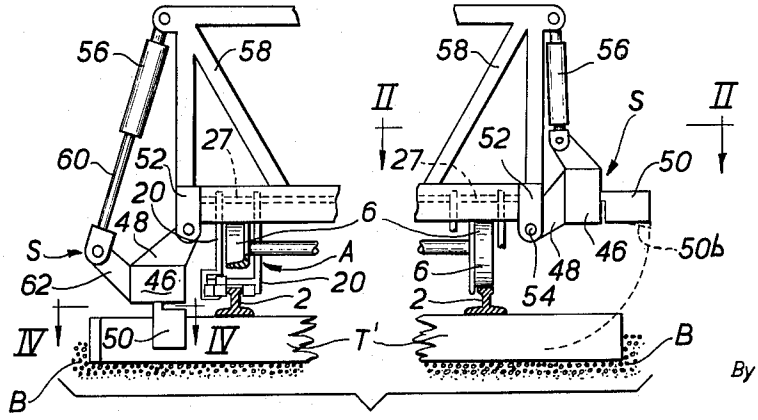



FIG. 3

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RAILWAY TIE REPOSITIONING APPARATUS

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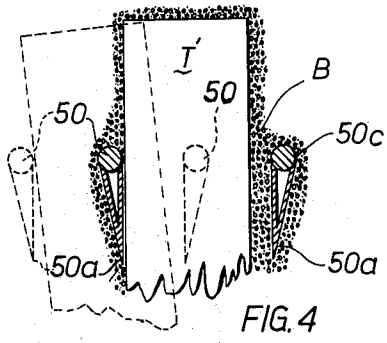



FIG. 4

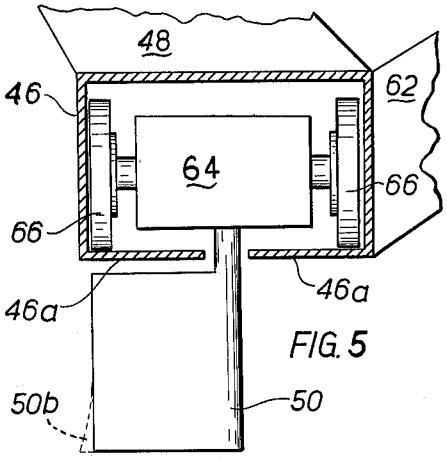



FIG. 5

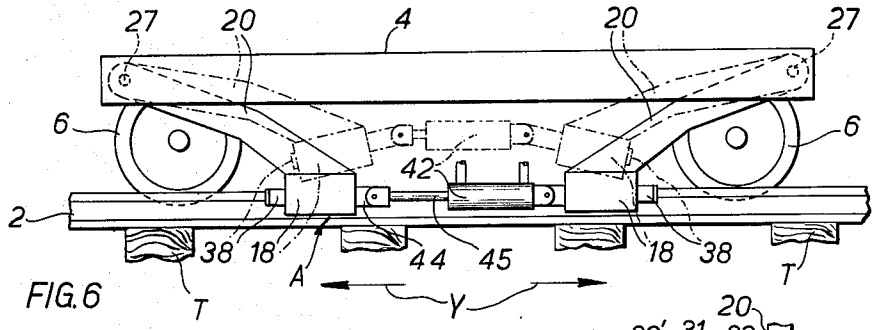



FIG. 6

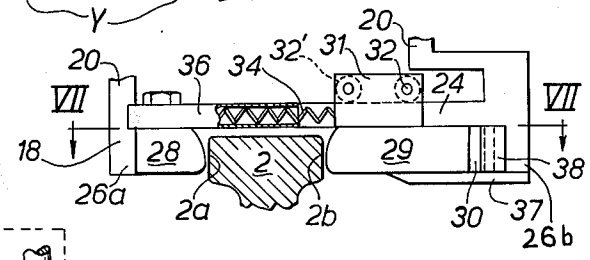



FIG. 8

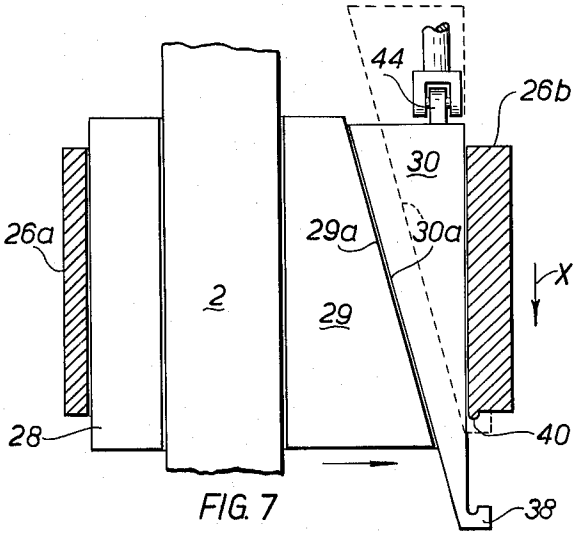



FIG. 7

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3,260,218

# RAILWAY TIE REPOSITIONING APPARATUS

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Filed Mar. 20, 1964, Ser. No. 353,563
16 Claims. (Cl. 104—9)

The present invention relates to a machine for repositioning railway ties underlying a railway track.

In the course of use railway ties may be displaced from their correctly spaced and aligned positions under the rails and such displacement requires correction so that the rails may be adequately supported and for other reasons.

The repositioning of displaced ties is commonly effected manually with the aid of levers, although machines have been devised for performing the operation. These machines have taken the form of railway vehicles capable of being held immobile on a railway track and equipped with means for engaging and shifting ties in said track while the vehicle is so held.

It is with this particular type of machine that the present invention is concerned and it is a general object of the invention to provide such a machine with tie-engaging and shifting means which is simple, robust, easy to operate and economical to manufacture.

Prior machines have included tie-engaging elements or fingers which descended substantially vertically into the ballast on either side of a tie before being moved in a horizontal direction to shift the tie, such fingers having often been relatively slender to expedite penetration of the ballast and thrusting aside its individual elements.

It will be readily appreciated that a finger moving vertically downwardly to penetrate the ballast is prone to be resisted in its progress by ballast stones massed in its path, in which event the finger may well bend or be otherwise damaged.

Specifically, therefore, it is an object of the invention to provide a tie-repositioning machine which has improved means for engaging the ties and shifting them to their correct positions.

It is a further object of the invention to provide a tie-repositioning machine having tie-engaging elements which are shaped for easy entry into the ballast surrounding said ties.

It is a further object of the invention to provide a tie-repositioning machine as aforesaid wherein said tie-engaging elements enter the ballast surrounding said ties at an angle such that the ballast offers minimal resistance to said elements.

It is a further object of the invention to provide a tie-repositioning machine including tie-moving elements swingably mounted at a side of the machine for entry into the ballast along a path whose terminal portion is mainly horizontal.

It is a related object of the invention to provide a tie-repositioning machine including an improved brake for holding said vehicle immobile in relation to said track.

It is a further object of the invention to provide a tie-repositioning machine including a cam-actuated clamp which is clampable on one of the rails of a track underlying the machine for anchoring the machine to said rail.

It is a further object of the invention to provide a tie-repositioning machine including a saddle for embracing a railway rail underlying the machine, said saddle housing apparatus for frictionally gripping said rail.

It is a further object of the invention to provide a tie-repositioning machine having a rail-engaging brake which frictionally grips said rail, said frictional grip being intensified by any tendency of the machine to move relative to the rail while the brake is applied.



It is a further object of the invention to provide a tie-repositioning machine having a brake as aforesaid which is movable into and out of engagement with the rail by means serving also to apply said frictional grip to the rail.

The above and other objects more or less wide than those herein specified are achieved in accordance with the invention by machinery for respacing railway ties underlying a railway track comprising a railway vehicle, an element operable for engaging a tie at an end thereof and structure swingably carried by said vehicle for moving said element between an operative tie-engaging position and an inoperative position spaced both vertically and horizontally from said operative position; the terminal movement of the element to its operative position being effected mainly horizontally and along a line substantially transverse to said vehicle, whereby the ballast surrounding the tie offers minimal resistance to the element during said terminal movement. The machinery further comprises means for shifting the tie-engaging element longitudinally of said vehicle initially to align it for engagement with a tie and thereafter, when the element is in its operative position, for applying thrust to said tie to reposition it; it being understood that such shifting is in a substantially horizontal direction. To immobilise the vehicle while the tie is being shifted a brake is provided for restraining its travel on the track. Said brake may comprise a clamp including brake shoes releasably clampable on a railway rail, said shoes being actuable by means of an impeller such as a cam.

An embodiment of the invention illustrating the elements, parts and principles thereof will now be described with reference to the accompanying drawings wherein:

FIG. 1 is a side elevation of a tie-repositioning machine according to the invention in operative position on a railway track, certain parts of the machine having been broken away for clarity of presentation;

FIG. 2 is a plan view partly in section on the line 11—11 of FIG. 3;

FIG. 3 is a broken, end elevation of the machine of FIG. 1 with certain parts of the superstructure omitted, alternative positions of the machine elements being shown at opposite sides of the machine;

FIG. 4 is a section on the line IV—IV of FIG. 3;

FIG. 5 is a section on the line V—V of FIG. 1;

FIG. 6 is a side elevation of a brake for the machine of FIG. 1, said brake being shown on the machine in alternative rail-engaging and neutral positions;

FIG. 7 is an enlarged plan view of part of the brake shown in FIG. 6 taken on the line VII—VII of FIG. 8, and

FIG. 8 is an end view of part of the brake in rail-engaging position.

The tie-repositioning machine of the invention is shown in FIG. 1 in operative position on a railway track R. The machine includes a wheeled railway vehicle V capable of travel on the track R, brakes A disposed on each side of the vehicle for securing it against movement relative to the track, and tie shifting devices S also mounted on each side of the vehicle and movable into and out of engagement with ties T underlying the rails 2 of track R.

Although the construction and operation of the machine will be described in greater detail hereinafter it will be understood that in use the vehicle V is moved along the rails 2 of the track R until it is positioned over a displaced tie T', the brakes A being then applied to restrain the vehicle against further movement relative to the rails 2. The shifting devices S are subsequently operated to shift the tie T' into its correct position relative to the adjacent ties.

Since the tie-shifting devices S are mounted on the vehicle V it is essential for the proper working of the

devices S that during their operation the vehicle should be restrained against travel relative to the rails 2, such restraint being effected by the brakes A as noted above, and this interdependence of the several parts of the machine should be borne in mind throughout the ensuing detailed description thereof.

The vehicle V is best shown in FIGS. 1 and 2 from which it will be seen to comprise a peripheral frame 4 mounted on wheels 6 and supporting a substantially flat platform 8, a power unit 10 and a reservoir 12 for hydraulic fluid.

Controls 14 may be mounted on the platform 8 within reach of an operator for whom a seat 16 may be provided.

Preferably the vehicle is self-propelled by means of the power unit 10, but since the propulsion means does not form a part of the present invention and also for the sake of clear presentation the details of such means have been omitted from the drawings and will not be described herein.

A brake generally designated A is mounted on each side of the vehicle V and said brakes may be actuated substantially in synchronism to immobilize the vehicle. As the brakes A are identical a description of the brake mounted on one side only of the vehicle will suffice, it being understood that similar structure is disposed on the opposite side.

As shown in FIGS. 2, 3, and 6 a brake A includes a pair of saddles 18 each of which is pivotally connected by a pair of arms 20 to the vehicle frame 4. The saddles are movable into and out of engagement with the adjacent rail 2 and house means for frictionally gripping said rail whereby they restrain the vehicle V against movement relative thereto.

One of the saddles 18 is shown in greater detail in FIGS. 7 and 8 in vehicle anchoring position on a rail 2, and includes a web 24 and flanges 26*a* and 26*b* connected thereto. The arms 20 are integral with the saddle, being pivoted at their free ends on a shaft 27 fixed to the frame 4. It will be noted that with the saddle in the position shown the flanges 26*a* and 26*b* confront the cheeks 2*a* and 2*b* respectively of the rail 2, and the saddle may therefore be said to house the rail.

The frictional rail-gripping means supported by each saddle include a brake shoe 28 mounted on the web 24 adjacent the flange 26*a* and a brake shoe 29 movable transversely in the saddle 18, each shoe carrying friction material on a face thereof confronting one of the rail cheeks. A wedge-shaped cam 30 slidable longitudinally in the saddle 18 constitutes a propeller for urging the brake shoes 28 and 29 into contact with the rail cheeks 2*a* and 2*b* thereby holding the saddle 18 immovable in relation to the rail 2. The shoe 28 is normally fixed to the web 24 but may be adjusted transversely of the saddle.

The movable brake shoe 29 also has a generally wedge shaped configuration, as shown in FIG. 8, and has two upstanding lugs 31—31 secured to its upper surface. The upper ends of the lugs 31—31 are linked by bolts 32—32 or the like on which rollers 32' are rotatably mounted, said rollers being in rolling engagement with the upper surface of web 24 of the saddle 18, and the brake shoe 29 being suspended below the web as shown in FIG. 8. For a purpose which will appear the shoe 29 may be biased away from the cheek 2*b* of the rail by resilient means such as compression springs 34, the latter being partially accommodated in tubes 36 secured to the ends of the web 24. The spring 34 are seated against closed ends of the tubes and act upon the lugs 31—31.

The cam 30 is retained in the saddle 18 by a plate 37 secured to the free edge of the flange 26*b*, and has a cam surface 30*a* co-operating with a cam surface 29*a* of the movable brake shoe 29. When the cam 30 is moved longitudinally in the saddle 18 in the direction X of FIG. 7 the surfaces 30*a*, 29*a* interact to cause relative movement between the brake shoe 29 and the web 24 whereby the friction material on the brake shoes 28, 29 is urged into engagement with the rail checks. Conversely when the cam is moved in the opposite direction the grip of the brake shoes on the rail is relaxed and the shoe 29 is carried away from cheek 2*b* by the springs 34.



It will now be apparent that the arrangement of the saddle 18, brake shoes 28 and 29 and the cam 30 constitutes a clamp for releasably clamping the rail 2.

To limit the extent by which the cam 30 may be withdrawn longitudinally from the saddle 18, the cam is formed with a hook 38 at its narrow end, said hook being engageable with a rounded protuberance 40 on the flange 26*b*.

At this point it will be recalled that the brake A includes two saddles 18, said saddles being axially aligned for engaging the rail 2, FIGS. 3 and 6. The cams 30 are arranged in the saddles so that they move apart from each other to propel the brake shoes to their rail-clamping positions, such movement being indicated by the arrows Y in FIG. 6, and move in the opposite direction or towards each other to positions wherein the grip of the brake shoes on the rail 2 is relaxed and the saddles are free to move relative to the rail. If therefore in the course of a tie-repositioning operation forces tend to move the vehicle V either backwards or forwards along the track R while the brake is applied the action of the cam in one saddle at each side of the vehicle will be intensified and consequently the brake shoes 28 and 29 in said saddles will bear with increased pressure against the cheeks 2*a* and 2*b*.

As an example, if a force should tend to move the vehicle to the right in FIG. 2, the cam 30 in the saddle 18 at the left hand side of the figure will become more tightly engaged between its associated brake shoe 29 and the saddle flange 26*b*, as will the cam 30 in the corresponding saddle at the opposite side of the machine.

A power unit such as hydraulic cylinder 42 is mounted between the two saddles 18 of each brake A and has a piston (not shown) reciprocable therein.

The cams 30 in said saddles carry lugs 44 respectively pivotally connected to the closed end of the cylinder 42 and to a piston rod 45 protruding from said cylinder. Through the coupling thus provided the cylinder moves the cams 30 substantially in synchronism longitudinally of their respective saddles, supply of fluid to the cylinder being regulated by one of the controls 14.

FIG. 6 shows the brake A in full lines in its rail engaging station; broken lines indicating a raised inoperative station thereof wherein the saddles 18 do not house the rail 2, the latter being the normal position of the brake when the vehicle V is in transit.

After a tie-repositioning operation has been accomplished the brake A is disengaged from the rails 2 in the following manner. Fluid is admitted to the cylinder 42 to move the piston towards the closed end thereof. This has the effect of moving the cams 30 in their saddles towards each other and away from their positions shown in full line in FIG. 7 until the hooks 38 thereon abut the protuberances 40 on the flanges 26*b* as indicated in broken line, FIG. 7. Thereafter continued movement of the piston draws the saddles 18 closer together, said hooks 38 providing a lost-motion connection between the cylinder 42 and the saddles. As the saddles are drawn together the arms 20 by which they are pivotally attached to the vehicle V cause them to swing and rise away from the rail 2 to the broken line position of FIG. 6 carrying the cylinder 42 with them. It may be mentioned here that supply of fluid to the cylinder 42 is effected through flexible hoses permitting such movement of the cylinder.

When the vehicle is to be immobilized again the sequence of the above operations is reversed, so that first the saddles are lowered to stations wherein they closely house or embrace the rail and then the brake shoes are clamped on the rail.

The means for restraining the vehicle V against travel on the track during operation having been described, it

is now appropriate to turn to the shifting devices S by which a tie may be repositioned.

Each of the devices S comprises structure including a guideway **46** and arms **48** connecting said guideway to the vehicle V. In this embodiment bladelike tie-engaging elements **50**, hereinafter for the sake of convenience termed "blades," project from each guideway **46** for positioning at each side of a tie in a manner to be described in more detail hereinafter.

The arms **48** are fixedly mounted on the guideways **46** and are pivotally attached to the frame **4** of the vehicle V as by clevises **52** and pins **54**. Each guideway is therefore mounted for swinging movement about the pins **54** which provide an axis paralleling the guideway and the longitudinal axis of the vehicle. A hydraulic cylinder **56** pivotally mounted on a framework **58** carried by the vehicle V has associated therewith a piston rod **60** pivotally connected to a lug **62** mounted on the guideway **46**, said cylinder being an example only of suitable means for raising and lowering the guideway **46** between the operative position shown at the left-hand side of the FIG. 3, and the inoperative position shown at the right-hand side of the same figure.

A study of FIG. 5 which is a sectional view of one of the guideways **46** will reveal that the guideway is generally channel-shaped, the flanges of the channel having inturned edges **46***a* forming a track on which a dolly **64** runs, wheels **66** of the dolly engaging the said edges. As shown in FIG. 5, the blades **50** are fixedly mounted on and depend from the dolly **64**, projecting through an elongated open mouth of the guideway defined by the edges **46***a*. Mechanism is provided for shifting the dolly **64** along the guideway **46**, a specific example of such means being a hydraulic cylinder **68** which may be mounted in the guideway **46** as shown in FIG. 1.

The blades **50** are spaced apart on the dolly **64** a distance slightly in excess of the width of a tie T and jointly with said dolly form a fork capable of embracing said tie in the manner shown in FIG. 1. When the vehicle V is positioned over a tie T′ to be respaced, depending upon the nature of the correction to be made, at least one of the devices S is operated, first to align the blades for engagement with the tie and then to lower them into engagement therewith. That is to say the cylinder **68** is actuated, if necessary, to move the blades into the appropriate position along the guideway **46** to allow them to embrace the tie when cylinder **56** is actuated to swing the guideway and blades down to their operative positions. The blades **50** projecting from the guideway penetrate the ballast B surrounding the tie T′ and take up positions on either side of the tie as shown in FIGS. 1 and 4. At least one of the dollies **64** is then moved longitudinally in its guideway to bring one of the blades **50** carried thereby into thrusting abutment with one side of the tie T′ and swing the tie into correctly spaced relationship with the adjacent ties. This operation is illustrated in FIGS. 1 and 4 wherein the tie T′ is shown in broken lines in its displaced position and in full lines in its correctly aligned position.

The blades **50** have tapered or thinned edges **50***a* which in the operative position of the shifting device S confront the adjacent rail **2**. The edges **50***a* may be peaked at the free ends of the blades as indicated at **50***b* in FIGS. 3 and 5, being otherwise substantially straight.

It will readily be understood that when being swung from the inoperative to the operative position the leading edges **50***a* and particularly the peaks **50***b* of the blades approach the ballast B along an arcuate path shown in broken line at the right hand side of FIG. 3 and make their terminal movement to the operative position in a mainly horizontal direction along a line substantially transverse to the vehicle V, and that the peak **50***b*, if provided, is usually the first portion of each blade to enter the ballast, said peak serving to facilitate insinuation of the leading edge of the blade between the elements of the ballast. As the swinging motion proceeds the tapered edges **50***a* cleave through the ballast embedding the tie until the blades reach their substantially vertical operative position adjacent the end of the tie. If either the peak **50***b* or the edge **50***a* of a blade should encounter an element of ballast which it is not able to thrust aside the blade carries said element with it since owing to the horizontal component of the knife's movement which is accentuated as the knife approaches its operative position such element will be urged merely against other yielding elements of ballast rather than against an unyielding "pillar" of such elements having its base on the ground.

The blades **50** are shown in cross section in FIG. 4, located in tie-engaging position and it will be observed that on each blade the side thereof remote from the tie effectively has a convex curvature indicated at **50***c*. Said curvature facilitates the horizontal movement of the dolly **64** during the repositioning operation since it allows a blade to be thrust broadside on through the ballast more readily than if a flat side were presented to the ballast, as will be obvious.

It may be convenient at this point to recapitulate the mode of operation of the machine of the invention.

As previously stated the vehicle V travels on the track R and is positioned over a displaced tie T′ in said track. For the purposes of the instant invention the vehicle may be located in this position in any desired manner, one possible way being by aligning a datum line on the vehicle with a correctly positioned tie adjacent to the displaced tie.

The brake A on each side of the vehicle is then lowered until the saddles **18** house the rails **2** and the brake shoes are immovably clamped thereon, thus restraining the vehicle against movement in either direction along the track R.

In the case of the tie T′ which has been slewed appreciably from its correct position both the tie shifting devices S are lowered to their operative positions by their respective cylinders **56** and the blades **50** carried by each are thrust into the ballast and take up their positions at opposite sides of each end of the tie.

This having been done the dollies **64** are moved in opposite directions along their respective guideways **46** carrying with them the tie ends embraced by the blades **50** until the longitudinal axis of the tie lies in its correct relationship (in this case parallel) to those of the adjacent ties. During this operation the reaction from the thrust applied to the tie by the blades **50** is transmitted via the vehicle V and brake A on each side therof to the rails **2** of the track R.

The tie shifting means S are then raised to their upper, inoperative positions where they may be secured by locking means, the brakes A are disengaged from the rails **2** and raised to their inoperative stations, and the vehicle V is moved along the track R to a position overlying the next tie to be corrected.

It will be understood that the precise steps outlined above in the repositioning of the tie T′ may be varied to suit the particular needs of the situation. For instance a tie which is parallel to its neighbour but which has approached too closely thereto may require both dollies to be moved in synchronism in the same direction while in some cases only one of the shifting means S need be used.

As indicated earlier herein, the foregoing constitutes a description of one embodiment of the invention which has been selected solely to illustrate the inventive principles thereof by way of example and not in any sense by way of limitation, the true scope of the invention being defined by the following claims.

What I claim is:

**1.** Machinery for repositioning ties underlying a railway track and embedded in a bed of ballast, comprising:

a railway vehicle for travelling on said railway track;

an element operable to shift said tie in the direction of the railway track; said element being movable between an operative position in which it is disposed

at a side of the tie in engagement therewith and an inoperative position in which it is disengaged from and raised above the level of said tie;

structure carried by said vehicle for moving said element between its two positions aforesaid, the movement of the element into operative position having a terminal component in the direction of the length of the tie;

mechanism for shifting said element in the direction of the railway track preparatory to its movement into operative position and, thereafter, to apply thrust to the tie engaged thereby; and

a brake for restraining travel of said vehicle on said railway track while said thrust is being applied.

2. Machinery as claimed is claim 1 wherein:

said element is constituted by a blade having a side engageable with said tie side when said element is in its operative position, and an edge bounding said blade side and oriented to lead when the element is moving towards its operative position;

said blade edge being directed to enter the said ballast bed at one margin thereof during the terminal movement of the element into operative position and being thinned to cleave through said ballast bed during such movement.

3. Machinery for repositioning ties underlying a railway track and embedded in a bed of ballast, comprising:

a railway vehicle for travelling on said railway track;

a fork operable to shift said tie in the direction of the railway track; said fork being movable between an operative position in which it embraces the tie adjacent one end thereof and an inoperative position in which it is raised above the level of said tie;

structure carried by said vehicle for moving said fork between its two positions aforesaid, the movement of the fork into operative position having a terminal component in the direction of the length of the tie;

mechanism for shifting said fork in the direction of the railway track preparatory to its movement into operative position and, thereafter, to apply thrust to the tie embraced thereby; and

a brake for restraining travel of said vehicle on said railway track.

4. Machinery as claimed in claim 3 wherein:

said fork includes a pair of blades;

each said blade having a side engageable with a side of said tie when said fork is in its operative position and an edge bounding said blade side and oriented to lead when the fork is moving towards its operative position;

said blade edge being directed to enter the said ballast bed at one margin thereof during the terminal movement of the fork into operative position and being thinned to cleave through said ballast bed during such movement.

5. Machinery as claimed in claim 3 wherein:

said fork includes a pair of blades;

each said blade having a side engageable with a side of said tie when said fork is in its operative position and an edge bounding said blade side and oriented to lead when the fork is moving towards its operative position;

said edge being directed to enter the said ballast bed at one margin thereof during the terminal movement of the fork into operative position and including a peak to facilitate entry into said ballast bed and being thinned to cleave through said ballast bed during said terminal movement.

6. Machinery for repositioning ties underlying a railway track and embedded in a bed of ballast, comprising:

a railway vehicle for travelling on said railway track;

an element operable to shift said tie in the direction of the railway track; said element being movable between an operative position in which it is disposed at a side of the tie in engagement therewith and an



inoperative position in which it is disengaged from and raised above the level of said tie;

structure carried by said vehicle and swingable about an axis paralleling the longitudinal axis of said vehicle for moving said element between its two positions aforesaid, the movement of the element into operative position having a terminal component in the direction of the length of the tie;

mechanism for shifting said element in the direction of the railway track preparatory to its movement into operative position and, thereafter, to apply thrust to the tie engaged thereby; and

a brake for restraining travel of said vehicle on said railway track while said thrust is being applied.

7. Machinery as claimed in claim 6 wherein:

said structure includes a guideway extending parallel to said axis and arms supporting said guideway and pivotally connected to said vehicle;

said element being shiftable along said guideway.

8. Machinery as claimed in claim 6 wherein:

said structure includes a guideway extending parallel to said axis and arms supporting said guideway and pivotally connected to said vehicle; and

said guideway includes an elongated opening through which said element projects downwards in said operative position and laterally in said inoperative position;

said element being shiftable along said guideway.

9. Machinery for repositioning railway ties underlying a railway track and embedded in a bed of ballast, comprising:

a railway vehicle for travelling on said railway track;

an element operable to shift said tie in the direction of the railway track; said element being movable between an operative position in which it is disposed at a side of the tie in engagement therewith and an inoperative position in which it is disengaged from and raised above the level of said tie;

structure carried by said vehicle for moving said element between its two positions aforesaid;

mechanism for shifting said element in the direction of the railway track preparatory to its movement into operative position and, thereafter, to apply thrust to the tie engaged thereby; and

a clamp on said vehicle for releasably clamping a rail of said railway track to restrain travel of said vehicle on said railway track while said thrust is being applied, said clamp comprising:

a saddle including a pair of parallel spaced lateral flanges, said saddle being disposable to house said rail with its flanges facing the cheeks thereof;

a pair of brake shoes carried by said saddle between said flanges and the said rail cheeks for releasably clamping said rail;

one of said brake shoes being disposed in fixed abutting relation to one of the flanges and said other brake shoe being movable in the saddle relative to the other of said flanges; and

a cam between said movable brake shoe and said other flange movable in the direction of the length of said saddle to apply a spreading force between said movable brake shoe and said other flange urging said movable shoe into frictional engagement with the rail cheek adjacent thereto and moving said saddle as a whole to procure frictional engagement of the fixed shoe with the other cheek of the rail.

10. Machinery as claimed in claim 9 wherein:

said cam is wedge-shaped and includes an inclined cam surface co-operable with a mating surface on said movable brake shoe.

11. Machinery as claimed in claim 9 further comprising:

a power unit for raising and lowering said clamp relative to said rail; and a coupling connecting said cam

for operation by said power unit co-incidentally with the raising and lowering of said clamp.

12. Machinery for repositioning railway ties underlying a railway track and embedded in a bed of ballast, comprising:

a railway vehicle for travelling on said railway track;

an element operable to shift said tie in the direction of the railway track; said element being movable between an operative position in which it is disposed at a side of the tie in engagement therewith and an inoperative position in which it is disengaged from and raised above the level of said tie;

structure carried by said vehicle for moving said element between its two positions aforesaid;

mechanism for shifting said element in the direction of the railway track preparatory to its movement into operative position and, thereafter, to apply thrust to the tie engaged thereby; and

a pair of clamps on said vehicle for releasably clamping a rail of said railway track to restrain travel of said vehicle on said railway track while said thrust is being applied, said clamps being swingable into and out of rail engaging positions and each said clamp comprising:

a saddle including a pair of parallel spaced lateral flanges; said saddle being disposable to house said rail with its flanges facing the cheeks thereof;

a pair of brake shoes carried by said saddle between said flanges and the said rail cheeks for releasably clamping said rail;

one of said brake shoes being disposed in fixed abutting relation to one of the flanges and said other brake shoe being movable in the saddle relative to the other of said flanges; and

a cam between said movable brake shoe and said other flange movable in the direction of the length of said saddle to apply a spreading force between said movable brake shoe and said other flange urging said movable shoe into frictional engagement with the



rail cheek adjacent thereto and moving said saddle as a whole to procure frictional engagement of the fixed shoe with the other cheek of the rail.

13. Machinery as claimed in claim 12 wherein:

said cams are wedge-shaped and respectively include inclined cam surfaces co-operable with mating surfaces on said movable brake shoes.

14. Machinery as claimed in claim 12 further comprising:

a power unit actuable both to operate said cam and to swing said clamps as aforesaid.

15. Machinery as claimed in claim 12 wherein:

a power unit is connected to said cams and, through lost motion connections including said cams, to said saddles;

said power unit being operable both to move said cams in said saddles and to swing said saddles into and out of rail-housing positions.

16. Machinery as claimed in claim 12 wherein:

said cams are wedge-shaped and respectively movable in opposite directions longitudinally of said saddles between said other saddle flanges and said movable brake shoes for applying spreading force as aforesaid.

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