June 16, 1964 J. D. HOLLEY ETAL 3,137,244

APPARATUS FOR LINING A RAILROAD TRACK

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FIG. 1

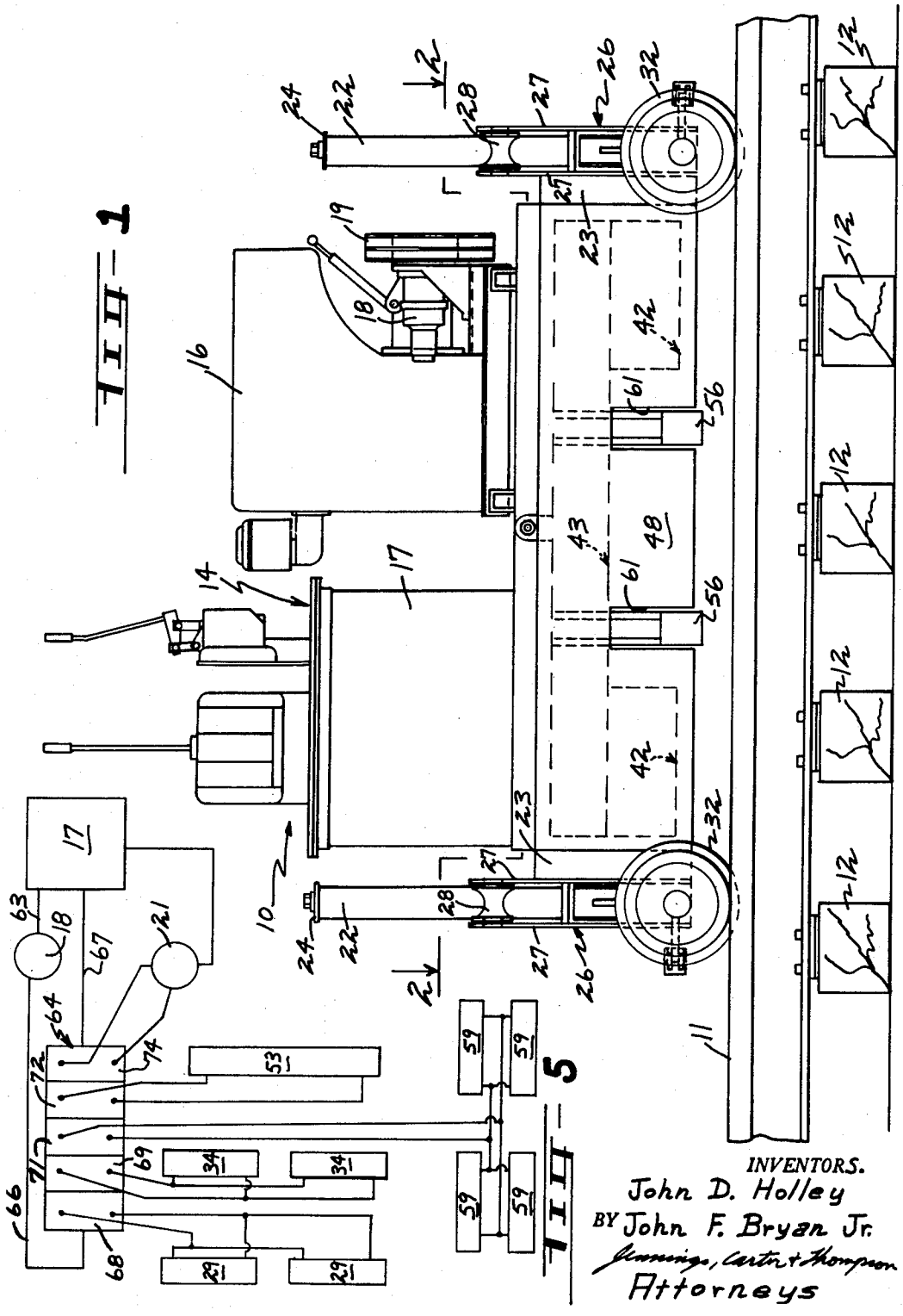


FIG. 5

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APPARATUS FOR LINING A RAILROAD TRACK

Filed July 12, 1961 3 Sheets-Sheet 2

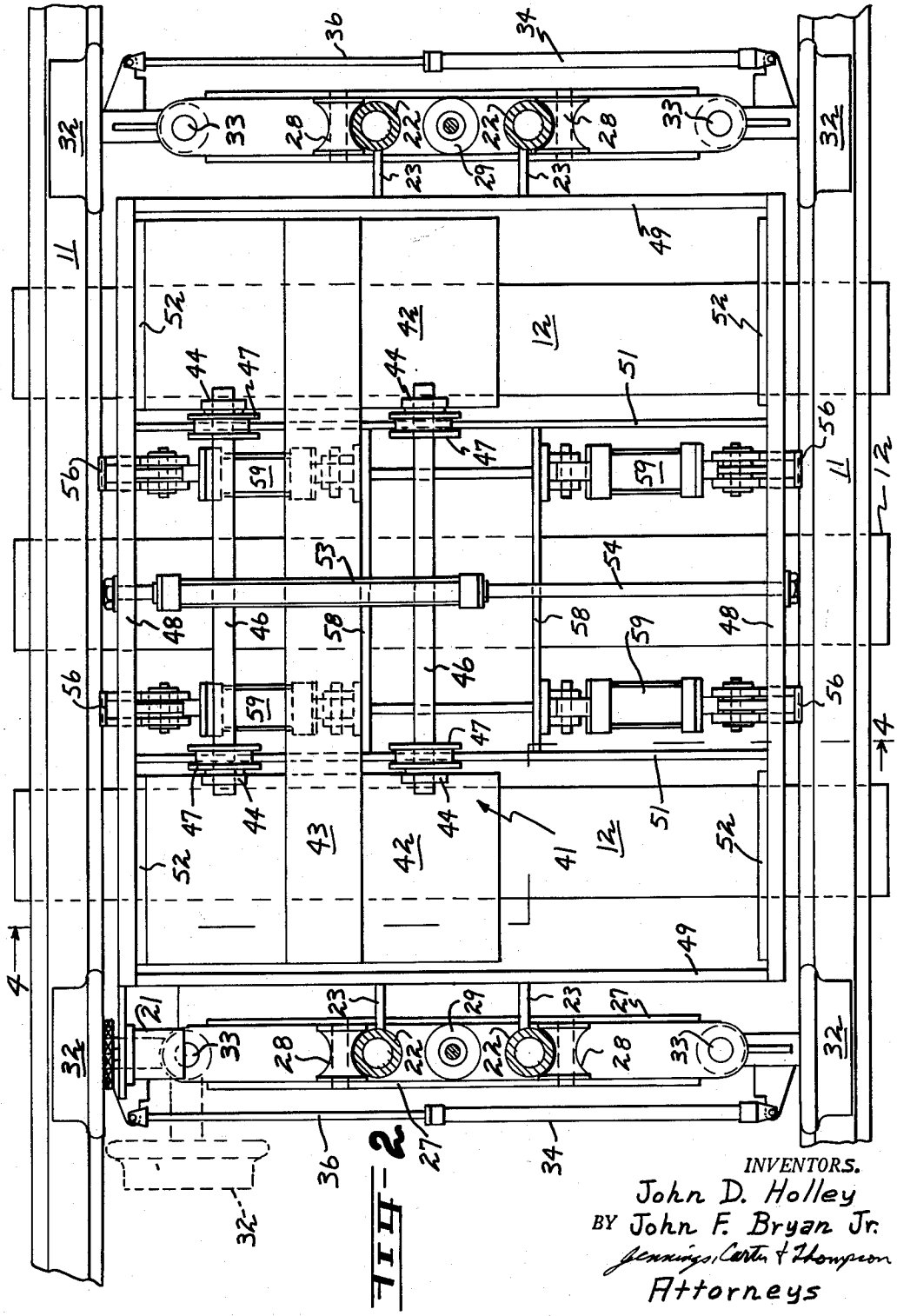


FIG. 2

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APPARATUS FOR LINING A RAILROAD TRACK

Filed July 12, 1961 3 Sheets-Sheet 3

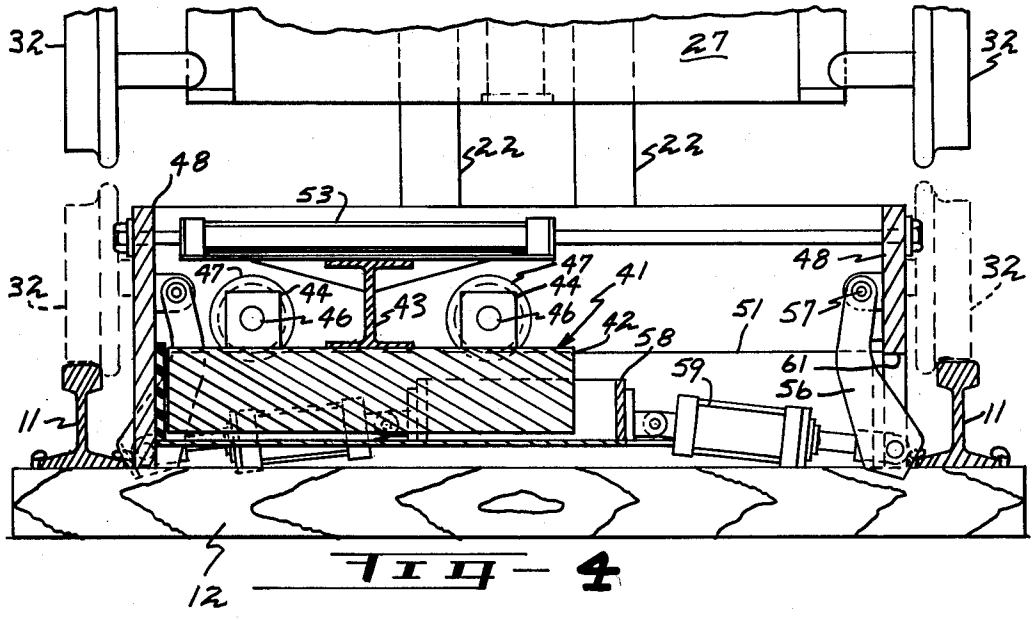


FIG - 4

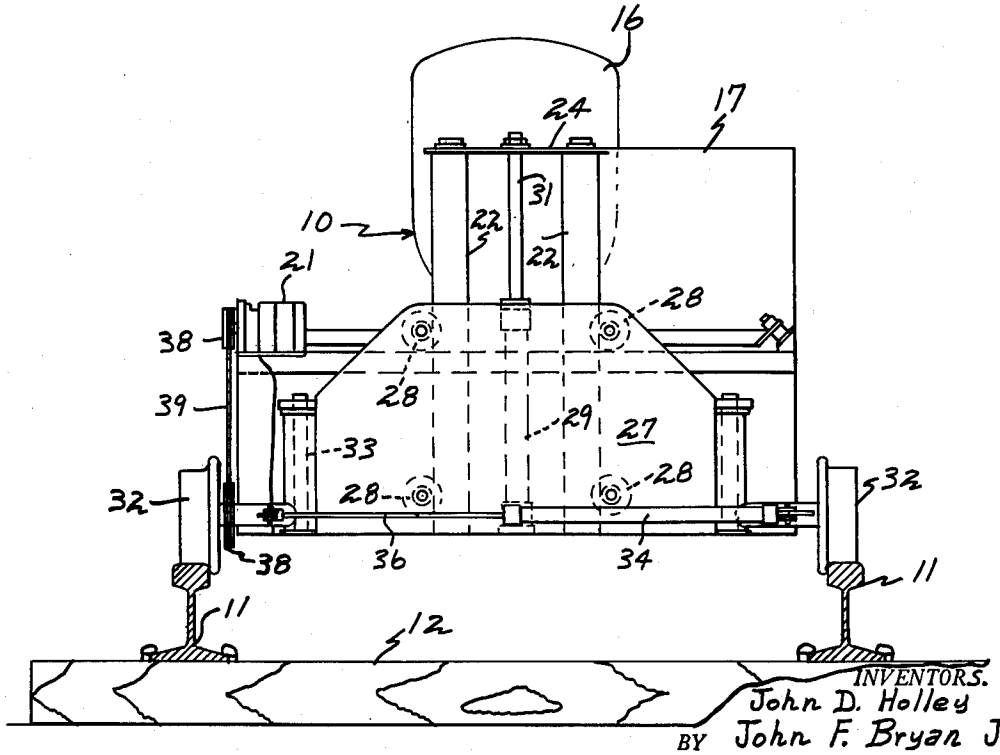


FIG - 3

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United States Patent Office 3,137,244 Patented June 16, 1964

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APPARATUS FOR LINING A RAILROAD TRACK

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8 Claims. (Cl. 104—8)

This invention relates to apparatus for lining or shifting a railroad track laterally and more particularly to such apparatus in which the inertia or impact of a moving weight is employed to shift the track.

Heretofore, in the lining of railroad track, it has been common to lift the track from the roadbed at least to some degree before the track is shifted. This has required the apparatus to rest or be supported on the roadbed or ballast while the track has been raised and during the lining operation. The ballast has been disturbed in some instances and the raising of the track has necessitated the lowering of the track after it has been shifted laterally unless, of course, the grade is to be raised. Thus, since the track has been raised from the roadbed and the lining apparatus has been supported on the roadbed heretofore, only a small force has been required to shift the track, and in most instances the force from a fluid cylinder has been sufficient.

It is an object of the present invention to provide apparatus for shifting a railroad track laterally comprising the use of a moving weight which transmits its inertia to the track for moving the track. The impact generated by the moving weight may be varied by the speed of acceleration, the distance over which the weight is accelerated, and the mass of the weight.

A further object of our invention is to provide apparatus supported entirely on the crossties in working position for shifting a railroad track laterally comprising a weight carrying frame having a reciprocating weight which may be moved from one side of the track to the other side at a position in general horizontal alignment with the rails. The inertia or impact forces of the moving weight are transmitted to the rails to shift the track laterally with the track in place on the roadbed and the entire apparatus supported on the crossties.

An additional object is to provide apparatus for shifting a railroad track without raising the track comprising a weight carrying frame supported on the crossties with means engaging the track to hold the frame in place between the rails, and a weight which is moved from one side of the track to the other side thereof engaging stop means at the end of its strokes. The stop means transmits the inertia or impact forces of the moving weight to the track through the track engaging means thereby to shift the track.

Another object is to provide apparatus which may be easily set off the track in a minimum of time by pivoting the wheels 90° after the wheels have been raised from the track, and then inserting a set-off rail beneath the wheels at right angles to the main track whereby the apparatus may be lowered onto the rails and removed from the tracks.

Apparatus embodying features of our invention is shown in the accompanying drawings, forming a part of this application, in which:

FIG. 1 is a side elevational view of the apparatus embodying the features of our invention showing the apparatus in non-working relation adapted for travel along the rails of a railroad track;

FIG. 2 is a sectional view taken generally along the line 2—2 of FIG. 1 showing the apparatus in traveling relation with the wheels adapted for pivoting to right-angular relationship to the track for removal from the track;

FIG. 3 is a front elevational view of the apparatus shown in position for traveling along the track;

FIG. 4 is a sectional view taken generally along the line 4—4 of FIG. 2 showing the apparatus lowered to working position for shifting a track with the apparatus supported entirely on the crossties; and,

FIG. 5 is a diagrammatic view of the fluid system of the apparatus embodying the present invention.

Referring now to the drawings for an understanding of our invention, we show in FIG. 1 a railway vehicle indicated generally by the numeral 10 adapted for traveling along rails 11 mounted on crossties 12. The term track as used in the specification and claims herein shall be interpreted as the structure comprising rails 11 and crossties 12. The term roadbed is intended to mean the ballast or supporting surface directly beneath crossties 12 and exclusive of the crossties.

Railway vehicle 10 comprises a main frame indicated generally by the numeral 14 and having an engine 16 mounted thereon. Fluid reservoir 17 is supported on main frame 14 and pump 18 is driven through pulley belts 19 connecting pump 18 to engine 16. A propelling motor 21 is mounted on frame 14 for propelling railway vehicle 10 along the track.

On each end of main frame 14 are vertical tubular members 22 fixed to frame 14 through connecting plates 23. Tubular members 22 are connected at their upper end by a connecting plate member 24.

A wheel frame indicated generally by the numeral 26 is mounted for vertical movement on each end of frame 14 on tubular members 22. Each of the wheel frames 26 comprises spaced end plates 27 having rollers 28 mounted therebetween. A cylinder 29 is secured to plates 27 and piston rod 31 thereof is secured to cross member 24. Thus, upon actuation of cylinders 29, main frame 14 moves relative to wheel frames 26 as rollers 28 of wheel frames 26 move up and down on tubular members 22. Wheel frames 26 are lifted from the rails after main frame 14 is supported by the crossties as shown in FIG. 4.

Wheels 32 of wheel frames 26 are mounted on pivots 33 and cylinders 34 with piston rods 36 are adapted to pivot wheels 32 in a right angular relationship to rails 11 as shown in FIG. 2 after wheels 32 are raised from the track. In this position, side set-off rails (not shown) may be inserted under wheels 32 at a right angular relationship to the track and apparatus 10 may be driven off the main track to permit traffic to move therealong.

For propelling vehicle 10 along the rails 11, propelling motor 21 is connected to one of the wheels 32 by sprockets 38 and sprocket chain 39. Propelling motor 21 is secured to wheel frame 26 and moves with wheels 32 when they are pivoted about pivots 33.

Main frame 14 has a carriage indicated generally by the numeral 41 thereon. Carriage 41 comprises a pair of spaced weights 42 which are secured to each other by a connecting I-beam 43 so that weights 42 move in unison when actuated. Extensions 44 extend upwardly from weights 42 and roller shafts 46 are mounted thereon. Rollers 47 are secured to roller shafts 46.

Fixed vertical side plates 48 are provided adjacent rails 11 and end plates 49 extend between side plates 48. Intermediate plates 51 likewise extend between side plates 48 and rollers 47 are mounted on the upper edge of intermediate plates 51 for movement therealong in a horizontal plane in substantially horizontal alignment with rails 11 in working position as shown in FIG. 4. Resilient pads 52 are mounted on side plates 48 to receive the impact from moving weights 42. For moving carriage 41, double acting cylinder 53 is secured to I-beam 43 and piston rod 54 is secured at each end to a side plate 48. Thus, double acting cylinder 53 moves and carries

carriage 41 therealong with rollers 47 engaging intermediate plates 51.

To hold main frame 14 in fixed position on crossties 12 after it has been lowered thereon, wedge blocks or locking dogs 56 are pivotally mounted at 57 on each side plate 48 and are adapted to be spaced on each side of a crosstie as shown in FIG. 2. Cylinders 59 are secured to plates 58 extending between intermediate plates 51 and move dogs 56 when actuated against the rails. Side plates 48 have cut-out portions 61 to receive dogs 56 so that the dogs may bear against rails 11 as shown in FIG. 4.

Referring now to FIG. 5 in which the hydraulic system for our apparatus is shown, we show pump 18 receiving fluid from reservoir 17 through line 63 and supplying fluid to valve bank 64 through supply line 66. Return line 67 returns fluid to reservoir 17 from valve bank 64. Valve 68 of valve bank 64 controls the flow of fluid to cylinders 29 through suitable fluid lines and wheel frames 26 may be raised and lowered relative to main frame 14 by suitable controls on valve 68. Valve 69 controls the flow of fluid to cylinders 34 which pivot wheels 32 to permit side set-off rails to be positioned under wheels 32 thereby to allow the apparatus to be driven from the track. Valve 71 controls cylinders 59 which actuate wedge blocks 56 to secure the apparatus in working position. Suitable fluid lines connect valve 71 with cylinders 59. Valve 72 controls the actuation and movement of carriage 41 through double acting cylinder 53. Valve 74 controls the flow of fluid to reversible fluid motor 21 which allows vehicle 10 to be driven in either direction of travel along the track.

In operation and beginning with the vehicle in non-working position as shown in FIG. 1, cylinders 29 are actuated to lower main frame 14 onto crossties 12. After frame 14 is supported wholly on crossties 12, further actuation of cylinders 29 raises frames 26 from the rails 11 as shown in FIG. 4. In this position, the weight of the entire apparatus is supported on crossties 12. Next, cylinders 59 are actuated to move wedge blocks 56 outwardly into engagement with the adjacent rails 11 and thereby to hold the apparatus in position between the rails. In this position, double acting cylinder 53 may be actuated to move carriage 41 and weights 42 thereby to shift the track.

Weights 42 may engage either side of the apparatus depending on the direction in which it is desired to shift the track. The amount of shifting is determined by the distance over which carriage 41 and weights 42 are accelerated. An acceleration of around 32 feet per second has been found to function effectively with weights 42 of around 2000 pounds. It should also be noted that the entire weight of the apparatus is resting on crossties 12 and the track is shifted along with apparatus 10 resting thereon. Apparatus 10 is of a weight of around 7000 pounds. The distance over which the weights 42 is accelerated is around 1½ feet and the speed of weights 42 at the time of impact on the resilient pads 52 is about 15 feet per second. Upon weights 42 hitting pads 52, the inertia or impact is transferred through the side member 48, thence through plates 51 and 58, cylinders 59 to wedge blocks 56 which act against the base of the adjacent rail 11. The forces acting through wedge blocks 56 to rail 11 move or shift the track in the direction of impact or thrust.

From the foregoing, it will be understood that we have provided apparatus to shift a railroad track laterally utilizing a moving weight which transmits its inertia to the track to move the track. The track may be shifted without lifting the track and without disturbing in any substantial manner the ballast supporting the track. The apparatus for shifting the track is supported wholly on the crossties and does not have any members engaging the ballast or roadbed beneath the track. The impact generated by the moving weight may be varied by the speed of acceleration, the distance over which the weight is accelerated, and the mass of the weight.

Further, wheel frames are provided that are movable vertically relative to the main weight carrying frame with the wheels adapted for pivoting 90° angularly to the track so that side set-off rails may be positioned thereunder and the vehicle moved from the track.

While we have shown our invention in but one form, it will be obvious to those skilled in the art that it is not so limited but is susceptible of various changes and modifications without departing from the spirit thereof, and we desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What we claim is:

1. Apparatus to shift a railway track laterally of the roadbed comprising a weight carrying frame having wheels adapted to run along the rails of a track in non-working position, means to lower the weight carrying frame onto the crossties and to raise the wheels from the track in the working position, a weight in said weight carrying frame, means to move the weight transversely of the rails, and means to transmit the inertia of the weight to the track whereby the track is shifted laterally of the roadbed.

2. Apparatus to shift a railway track laterally of the roadbed with the track in place thereon comprising, a weight carrying frame having wheels adapted to run along the rails of the track in non-working position of the apparatus, means to lower the weight carrying frame onto the crossties of the track and to raise the wheels off the rails in the working position of the apparatus, a weight in the frame, track engaging means actuated after the weight carrying frame has been lowered to engage the track for transmitting forces from the weight to the track, means to reciprocate the weight transversely of the rails at a predetermined rate of speed in substantially horizontal alignment with the track, and means to transmit the kinetic energy of the moving weight to the track engaging means whereby the track is moved laterally in the direction of movement of the weight.

3. Apparatus to shift a railway track laterally of the roadbed without disturbing the roadbed and without raising the track during the shifting of the track comprising a weight carrying frame having wheels adapted to run along the rails of the track in non-working position of the apparatus, means to lower the weight carrying frame onto the crossties and to elevate the wheels from the rails without elevating the track whereby the entire weight of the apparatus is on the crossties, a movable weight in the frame, rail engaging means actuated after the weight carrying frame has been lowered to engage the rails for transmitting force from the weight to the rails, means to reciprocate the weight transversely of the rails at a predetermined rate, and means at the end of the stroke of said weight adjacent one of the rails to stop the movement of the weight and to transmit the impact forces thereof to the rail engaging means whereby the track is moved laterally in the direction of movement of the weight.

4. Apparatus to shift a railway track laterally of the roadbed without disturbing the roadbed or raising the track during the shifting thereof comprising a weight carrying frame having wheels adapted to run along the rails of the track, means to lower the weight carrying frame onto the crossties and to elevate the wheels from the rails without elevating the track whereby the entire weight of the apparatus is supported on the crossties, a movable weight in the frame, a pair of spaced dogs on each side of the weight carrying frame, means to actuate the dogs after the frame is lowered to engage the adjacent rails and thereby hold the frame against transverse movement between the rails, means to reciprocate the weight transversely of the rails at an accelerated rate in substantially horizontal alignment with the track, and means to stop the movement of the weight and to transmit the kinetic

energy of the moving weight through the adjacent dogs to the rails thereby to shift the track.

5. Apparatus to shift a railway track laterally of the roadbed without disturbing the roadbed or raising the track during the shifting of the track comprising a weight carrying frame having wheels adapted to run along the rails of a track, means to lower the weight carrying frame onto the crossties and to elevate the wheels from the rails without elevating the track whereby the entire weight of the apparatus is supported on the crossties, a pair of spaced weights mounted in the frame for movement to either side of the weight carrying frame, a pair of spaced dogs on each side of the weight carrying frame, means to actuate the dogs after the frame is lowered to engage the adjacent rails and hold the frame against transverse movement between the rails, means to reciprocate the weights in unison toward either rail at a predetermined rate, and means to transmit the kinetic energy of the moving weights through the dogs to the adjacent rail thereby to shift the track.

6. In apparatus to shift a railway track laterally of the roadbed without raising the track during the shifting of the track, a weight carrying main frame, a wheel frame on each end of the main frame comprising a pair of wheels adapted to ride along the rails of a track, means mounting each wheel frame for vertical movement relative to the main frame, means to lower the weight carrying main frame onto the crossties and to raise the wheels off the track whereby the entire apparatus is supported on the crossties, a movable weight on the main frame, means to move the weight transversely of the rails in substantially horizontal alignment therewith, and means to transmit the kinetic energy of the moving weight to the track thereby to shift the track.

7. Apparatus to shift a railroad track laterally of the roadbed comprising a translatably supported main frame, a weight carrying frame carried by the main frame

and supported on the crossties of the track, a weight in the weight carrying frame movable transversely of the rails, means carried by the weight carrying frame for engaging the rails to secure the weight carrying frame to the rails with the weight carrying frame resting on the crossties, means to move the weight transversely of the rails, and means to transmit the kinetic energy of the weight to the track through the rail engaging means whereby the track is moved laterally.

8. Apparatus to shift a railway track laterally of the roadbed comprising a translatably supported main frame, a weight carrying frame carried by the main frame of a length to fit between the rails of the track and rest on the crossties thereof, means on the weight carrying frame engaging the rails to lock the weight carrying frame in place between the rails, a weight in the weight carrying frame movable transversely of the rails, means to move the weight in substantially horizontal alignment with the track, and means to transmit the kinetic energy of the moving weight to the track through the rail engaging means whereby the track is moved laterally in the direction of thrust.

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