

Jan. 19, 1960 J. W. CHRISTOFF 2,921,537
TRACK ALIGNING DEVICE FOR USE IN CONJUNCTION WITH BALLAST
HANDLING DEVICES USED UNDER RAILROAD TRACKS
Filed April 2, 1957 4 Sheets-Sheet 1

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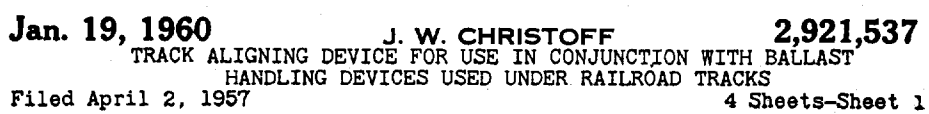
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4 Sheets-Sheet 2

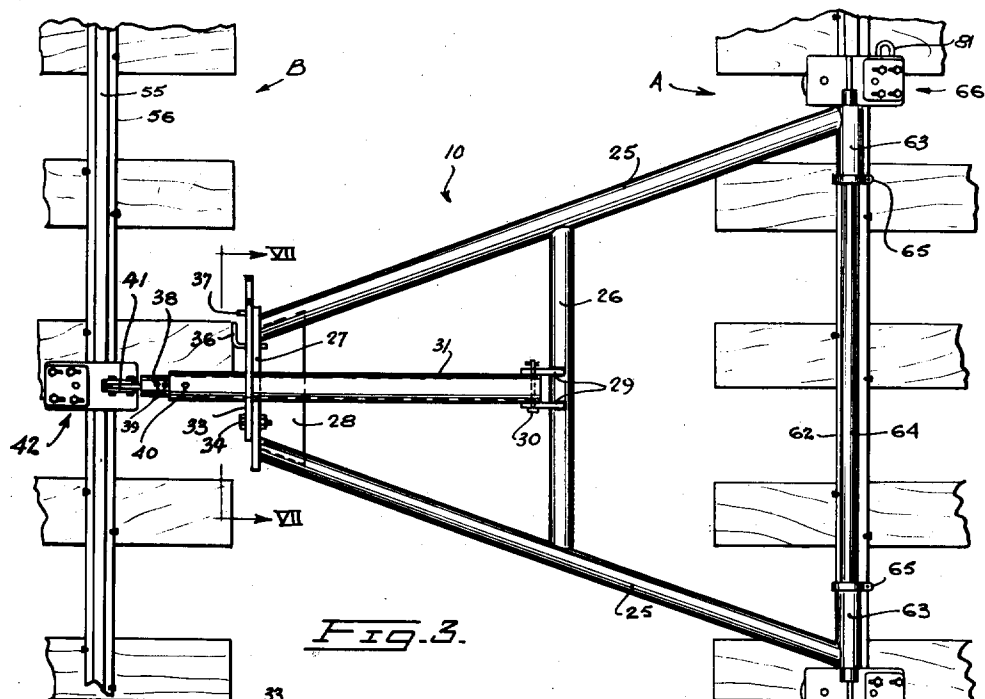


Fig. 3.

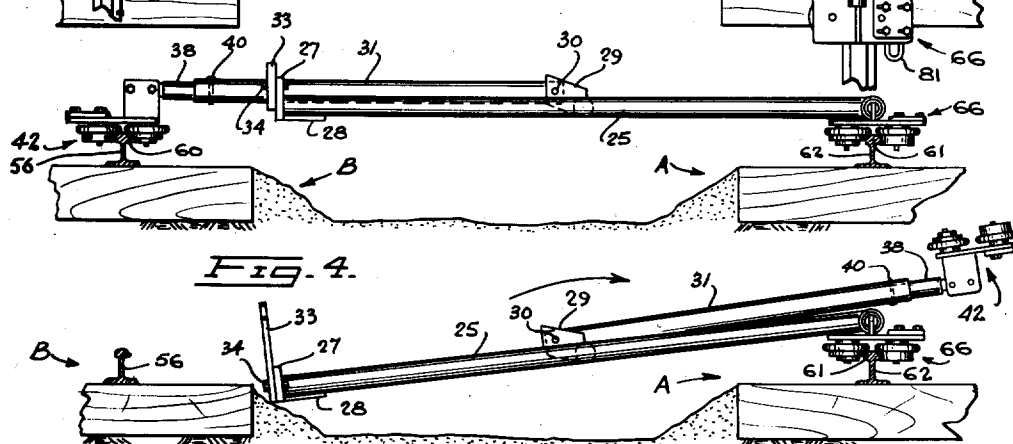


Fig. 4.

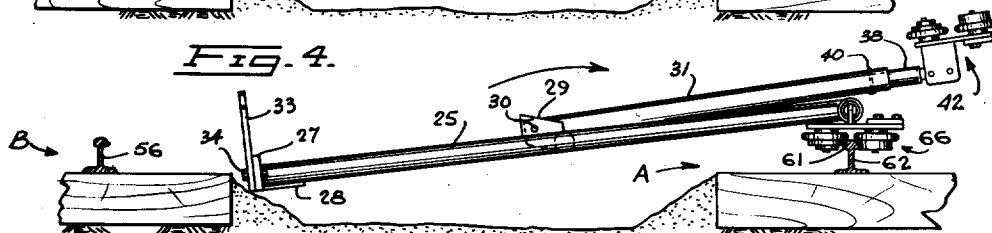


Fig. 5.

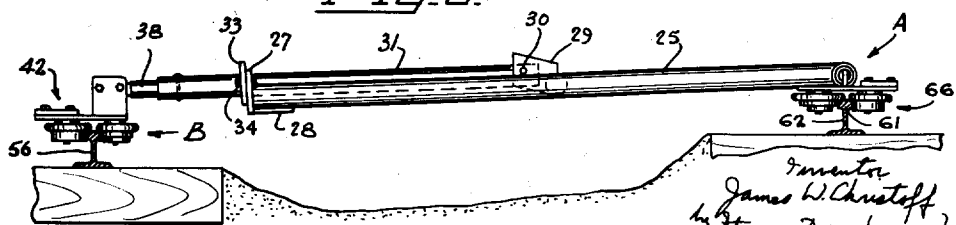


Fig. 6.

Inventor
James W. Christoff
by Steven Rains, William A. Hall
his attorney

Jan. 19, 1960

J. W. CHRISTOFF

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4 Sheets-Sheet 3

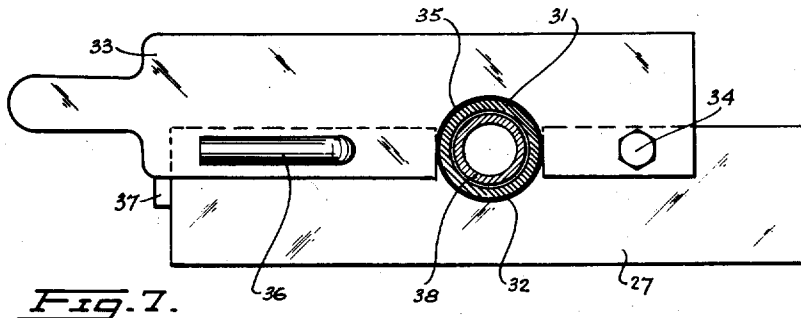


FIG. 7.

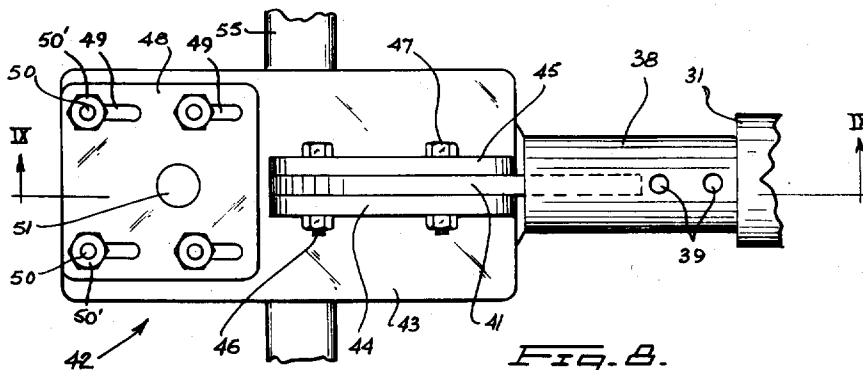


FIG. 8.

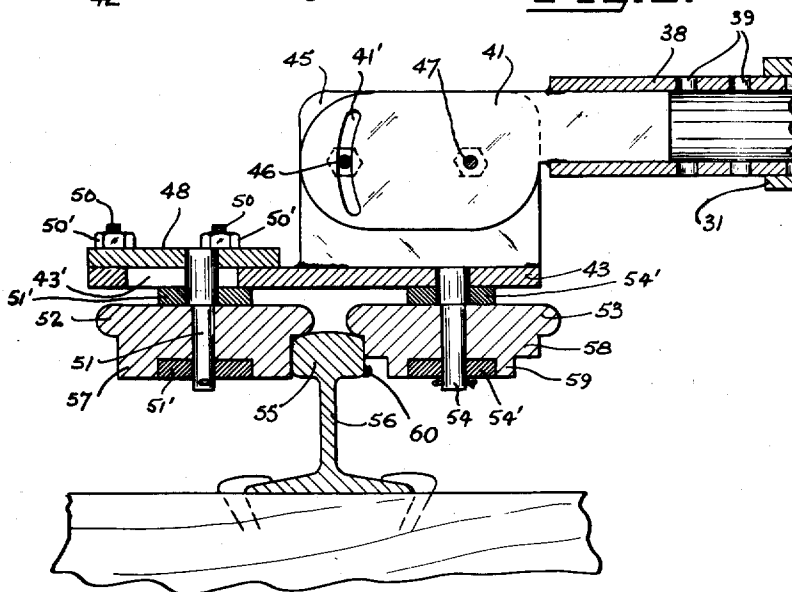


FIG. 9.

Inventor
James W. Christoff
by Stevens Davis Miller
his attorney

Jan. 19, 1960

J. W. CHRISTOFF

2,921,537

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4 Sheets-Sheet 4

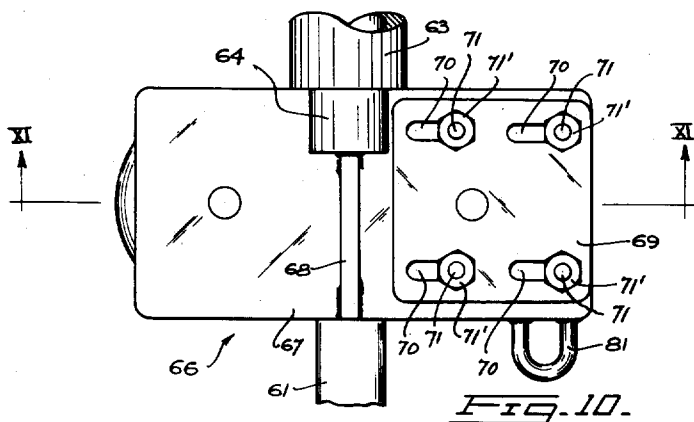


FIG. 10.

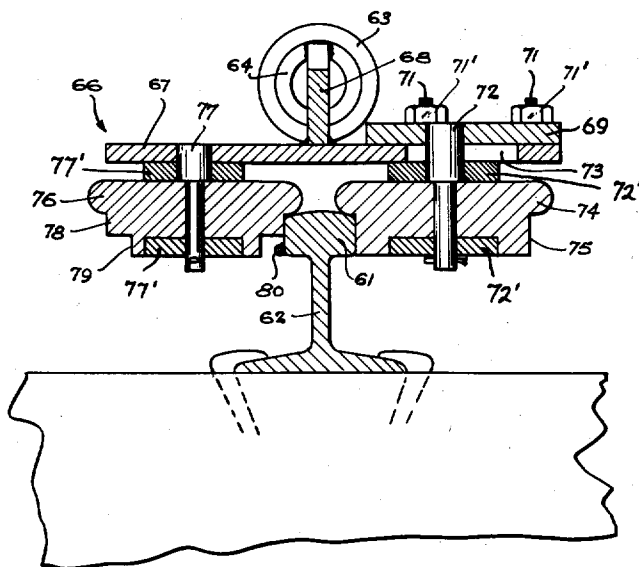


FIG. 11.

Inventor
James W. Christoff
by *Sterns, Davis, Keller, Smith*
his attorney

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TRACK ALIGNING DEVICE FOR USE IN CONJUNCTION WITH BALLAST HANDLING DEVICES USED UNDER RAILROAD TRACKS

James W. Christoff, Minneapolis, Minn., assignor, by mesne assignments, to Mannix Co. Ltd., Calgary, Alberta, Canada

Application April 2, 1957, Serial No. 650,111

1 Claim. (Cl. 104—8)

This invention relates to a track aligning device or so-called liner for use in conjunction with under-track devices of the so-called ballast sled and ballast plow types used for handling ballast on railroad tracks.

Ballast plows are employed for removing fouled ballast from a railroad roadbed. A plow is inserted between the roadbed and the ties to which the track rails are secured and is then towed along the track in this position by a locomotive. As the plow progresses it raises the ties from the roadbed ahead of it, supports the ties and the tracks secured thereto, as the device passes underneath, and finally allows the ties and track to settle back onto the roadbed or "sub-grade" behind the device. The weight of the ties and track supported by the plow is considerable and the plow is therefore pressed firmly down against the ballast. By providing the plow with one or more scraper blades it is possible to separate either the full depth of ballast or a layer of ballast of chosen depth and displace this ballast to the side of the track beyond the ends of the ties, so that when the ties resettle this displaced ballast can be readily removed.

Ballast sled devices are similar to ballast plows in that they are inserted between the roadbed and the ties and are towed along in this position by a locomotive. Sleds, however, are used either during the laying down of new tracks or to perform a reballasting operation following the pulling of a ballast plow in the manner just described. After the plow has removed the fouled ballast, or, in the case of a new track laid directly on the subgrade, after the track has been so laid, fresh clean ballast is dumped onto the track to lie on top of the ties and rails. The function of the sled is to raise the ties up to their desired level and distribute the ballast evenly beneath them. Subsequently additional ballast will normally be dumped on the track between each pair of adjacent ties, this latter operation usually being carried out manually, since it does not require raising of the track.

When the track resettles onto the roadbed (the subgrade behind a plow, or a layer of fresh ballast behind a sled), it is important to ensure correct lining up of the track in the same position as it occupied prior to pulling of the plow or sled. Resettling of the track into correct alignment can be performed manually, but this increases the number of men required to a team and may be subject to some error.

Not only is correct alignment necessary to keep the track straight, but on double track it is essential in order to ensure proper spacing between the two tracks.

The object of the present invention is to provide a "liner" device adapted for towing behind a sled or plow in use on one track of a double track section, such device being capable of continuously lining up the raised track as it settles behind such sled or plow.

The various features of the invention will become apparent from the description which follows and from the appended claim. To support the description, attention is directed to the accompanying drawings, in which:

Figure 1 shows a plan view of a section of double track

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demonstrating the manner of use of a liner according to the present invention being towed behind a ballast plow;

Figure 2 is a side elevation of Figure 1;

Figure 3 is a plan view on a larger scale of the liner itself;

Figure 4 is an elevation view taken from the lower side of Figure 3;

Figure 5 is a view similar to Figure 4 showing the parts of the liner in a different position;

Figure 6 is a view similar to Figure 4 showing operation of the device with tracks of different elevation;

Figure 7 is a fragmentary view taken on the line VII—VII in Figure 3;

Figure 8 is an enlarged plan view of the extreme left-hand portion of the liner as seen in Figure 3;

Figure 9 is a section taken on the line IX—IX in Figure 8;

Figure 10 is an enlarged fragmentary plan view of a further portion of the liner seen in Figure 3; and

Figure 11 is a section on the line XI—XI in Figure 10.

Figures 1 and 2 demonstrate the manner in which the liner 10 is towed by means of a cable 11 behind a ballast plow 12 which itself is towed by cables 13 from a towing bar 14 connected by further cables 15 to a mounting 16 which is slidable on a transverse bar 17 secured to the rear of a flat car 18. Control over the transverse movement of the mounting 16 along the bar 17 is effected by means of a screw threaded rod 19 controlled by handle 20. The purpose of this transversely slidable mounting is to be able to move the towing bar 14 to one side or other of the track to compensate for curvature of the track and to avoid the plow 12 tending to cut the corner on a curve.

It will be noted that the cable 11 towing the liner 10 is also connected to the mounting 16, although this is not an essential feature. Alternative positions for securing the forward end of the cable 11 are the centre of the towing bar 14 or a suitable point at the rear of the plow 12.

This assembly is towed along track A by means of a locomotive 21. As appears most readily from Figure 2, the plow 12 is being employed to "skeletonize" track A. Initially, in front of the plow 12 the ties 22 are resting on a layer of ballast 23 which in turn rests on the subgrade 24. The advancing plow 12 slides along the subgrade 24, raises the track in advance of itself, and plows the ballast 23 out to the side of track A remote from the adjacent track B.

Rearwardly of the plow, track A settles back onto the subgrade 24, and the liner 10 effectively interconnects the inside rail 62 of track A with the inside rail 56 of adjacent track B just in advance of the position where the ties 22 settle onto the subgrade 24. In this manner any tendency on the part of track A to become misaligned in relation to track B is prevented, track B providing a firm datum from which to line up track A. Immediately behind the liner 10, track A comes to rest on firm ground so that it has no opportunity to pass out of alignment again.

The liner of the present invention has been shown used in conjunction with a ballast plow. It is to be understood that it is equally applicable to use with any other under-track device, such as a ballast sled, in which one track is raised and then allowed to resettle.

For details of structure of the liner 10, attention is directed to Figures 3 to 11. Referring firstly to Figures 3 and 4, the liner 10 will be seen to consist of a tubular framework of welded construction formed generally in the shape of an A, i.e. having a pair of main tubular side members 25 connected centrally by a transverse tubular member 26, and, at the end of the main members 25 where they approach most closely to one another, by a

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first bridging plate 27 extending across the ends of the members 25 and a second bridging plate 28 lying beneath the ends of these members 25. A pair of lugs 29 are secured to the centre of the transverse member 26 and they serve to carry a pin 30 which forms a pivot pin for a tubular arm 31. Near its other end the tubular arm 31 rests in an approximately semi-circular cavity 32 formed in the plate 27 (see Figure 7). A locking plate 33 is pivotally mounted by a bolt and nut assembly 34 to one end of the plate 27, and, in its closed position shown in Figure 7, engages the top of the tubular arm 31 by means of a complementary generally semi-circular recess 35. A locking pin 36 is arranged to pass through a pair of registering holes in the plates 27 and 33 to hold the latter in closed position. A stop 37 limits downward movement of the locking plate 33 relatively to the plate 27.

Slidably mounted within the tubular arm 31 is an inner tubular arm 38. Series of holes 39 are formed top and bottom in the arm 38, a chosen pair of these holes 39 being engaged by a pin 40 which extends through a pair of holes in opposite sides of the end of the outer tubular arm 31. In this manner the degree to which the inner arm 38 projects from the outer arm 31 may be selected and set.

Secured to the outer end of the inner arm 38 is a plate 41 which serves to mount a rail-engaging head 42, details of which are illustrated on a larger scale in Figures 8 and 9. This rail-engaging head 42 consists of a main horizontal plate 43 which carries a pair of upstanding lugs 44 and 45 between which the plate 41 is pivotally engaged, a first nut and bolt assembly 46 co-operating with holes in the plates 44 and 45 and a slot 41' in the plate 41 and a second nut and bolt assembly 47 passing through holes in all these plates to serve as a pivot pin. The main plate 43 carries a slidable horizontal plate 48 which is provided with slots 49 co-operating with studs 50 projecting upwardly from the plate 43 and engaged by nuts 50'. A pin 51 projects downwardly from the plate 48 extending through a slot 43' in the plate 43, such pin 51 serving to mount a free running rail-engaging wheel 52 between bearings 51'.

The rail-engaging wheel 52 is disposed to co-operate with a second rail-engaging wheel 53 mounted on a further pin 54 between bearings 54', these wheels engaging the head 55 of the rail 56 of track B in the manner shown in Figure 9. It will be noted from Figure 9 that the wheel 52 is stepped at 57 to enable this wheel to engage and rest upon the head 55 of the rail 56, and that the wheel 53 is similarly stepped at 58 for the same purpose. The wheel 53 is also stepped a second time at 59 to provide space for travel of the wheel 53 past rail head bonds 60 that are commonly employed to connect adjacent rails electrically for the transmission of signalling currents.

The other portions of the liner which engage with the head 61 of the inside rail 62 of track A will now be described.

Each of the spread-apart ends of the main tubular members 25 carries a short tubular socket 63, the two sockets 63 being axially aligned with one another and serving to mount an inner tubular member 64 extending between the two sockets 63 and projecting slightly outwardly beyond each of them. The position of the inner member 64 relatively to the outer sockets 63 can be adjusted as desired and then locked by means of clamps 65 formed on the inner ends of the sockets 63.

At each of its ends, the inner member 64 carries a further rail-engaging head 66. The details of the lower one of these heads 66 are seen in Figures 10 and 11, the upper head 66 being identical in mirror image with the lower such assembly.

Referring now to Figures 10 and 11, the head 66 there shown will be seen to consist of a horizontal main plate 67 secured to the end of the inner tubular member 64

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by means of a vertically disposed, generally triangular plate 68. Mounted on the upper side of the plate 67 is an adjustable plate 69 having slots 70 therein which co-operate with studs 71 projecting up from the plate 67 and carrying nuts 71'. The structure of this plate and its method of mounting a free-running rail-engaging wheel 74 by means of a pin 72 passing through a slot 73 in the plate 67, is similar to the manner of mounting the wheel 52 shown in Figure 9. Bearings 72' complete this assembly, the wheel 74 being stepped at 75 to enable it to engage and rest on the head 61 of the rail 62. At the other end of the plate 67 a second free-running rail-engaging wheel 76 is mounted on pin 77 between bearings 77'. This wheel 76 is stepped initially at 78 and again at 79 to avoid fouling a rail head bond 80.

Figure 10 shows a towing lug 81 secured to the plate 67. As appears from Figures 1 and 3, there will be a similar towing lug 81 on the other rail-engaging head 66, and it will in fact be this second lug 81 which is employed when the device is towed in the manner illustrated in Figure 1. By providing a towing lug 81 on each of the rail-engaging heads 66 the device is made available for towing in either direction.

The manner in which the device can quickly be disengaged from the rail 56 of track B, which is the track not being worked with the ballast plow, in order to allow normal traffic to pass on this track, is illustrated in Figure 5. The locking pin 36 is removed, the locking plate 33 is swung upwardly to the position seen in Figure 5 and then the main arm 31 is swung back, also as shown in Figure 5. This operation can be carried out very quickly, and thus avoids any need to restrict the speed of traffic on track B. It can just as readily be returned to its original position after the train on track B has passed. It may not even be necessary to stop pulling of the plow 12 while the other train passes, so quickly can the liner be disengaged from and re-engaged with track B, although it is usually preferred to stop pulling since the liner is no longer effective to perform its aligning function with its rail-engaging head 42 out of contact with the rail 56. In any event if pulling of the plow is interrupted it will be for only a short period.

The liner is designed for a number of possible adjustments, as will be evident from the foregoing. Firstly; variations of distance between the inside rails of the adjacent tracks may be provided for by movement of the pin 40 into a different pair of holes 39. Variations in the width of rail heads can be taken care of by adjustment of the plates 48 and 69 by loosening of the nuts 50' and 71' and retightening in the required position. Finally, the adjustment available by pivoting of the plate 41 within the plates 44 and 45 which provides for tilting of the rail-engaging head 42 relatively to the remainder of the device, and the corresponding pivotal movement permitted the rail-engaging heads 66 by virtue of turning of the inner tubular member 64 in the sockets 63, is required in order to provide for different track elevations such as are shown in Figure 6. Such differences between the elevation of adjacent tracks is commonly experienced at curved sections of the track.

I claim:

A device for aligning a length of shiftable track from a length of rigid track that comprises a generally triangular frame, rollers mounted on said frame adjacent to two of its corners to engage a rail of said shiftable track, an arm, rollers on one end of said arm to engage a rail of said rigid track, said rollers being mounted for rotation about vertical axes and provided with flanges at their upper ends so that said rollers grasp the sides of the head of a rail and the flanges prevent the rollers from dropping down below the head of a rail, the lower end of each roller that registers with the outside of each rail being cut away so that it will not strike the electrical connections between adjacent rail sections, means mounting said arm on said frame for pivotal movement about

an axis parallel to the side of the frame having rollers at both its ends from a position with said one end projecting from a third corner of said frame to a position retracted from the rail of said rigid track, and means to lock said arm in said projecting position rigid with said frame and substantially in the plane thereof, whereby the rollers on said one end of said arm may engage a rigid track susceptible to intermittent use and transmit thrust through said frame to align the shiftable track

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and yet may be pivoted free of said rigid track to accommodate traffic thereon.

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