Jan. 19, 1960 L. J. CROONENBERGHS 2,921,538

TRACK ALIGNING METHOD FOR USE IN CONNECTION WITH BALLAST HANDLING DEVICES USED UNDER RAILROAD TRACKS

Filed April 2, 1957 4 Sheets-Sheet 1

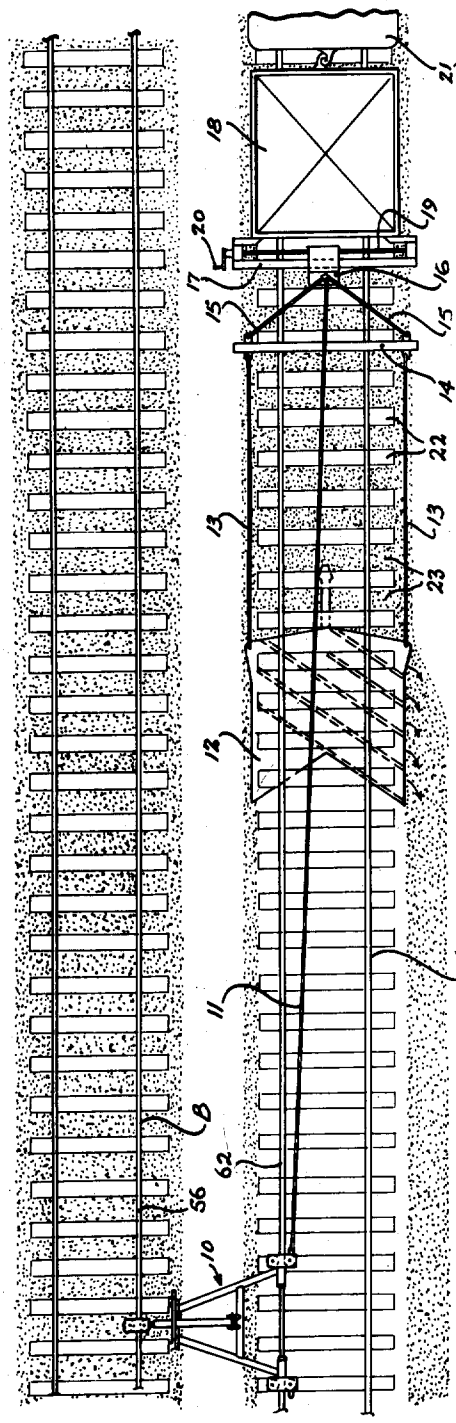


Fig. 1.

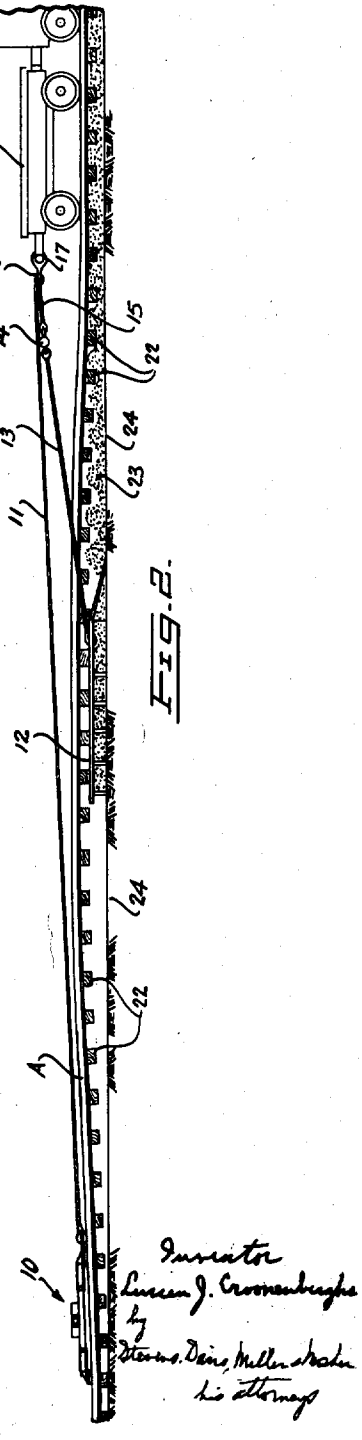


Fig. 2.

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Filed April 2, 1957 4 Sheets-Sheet 2

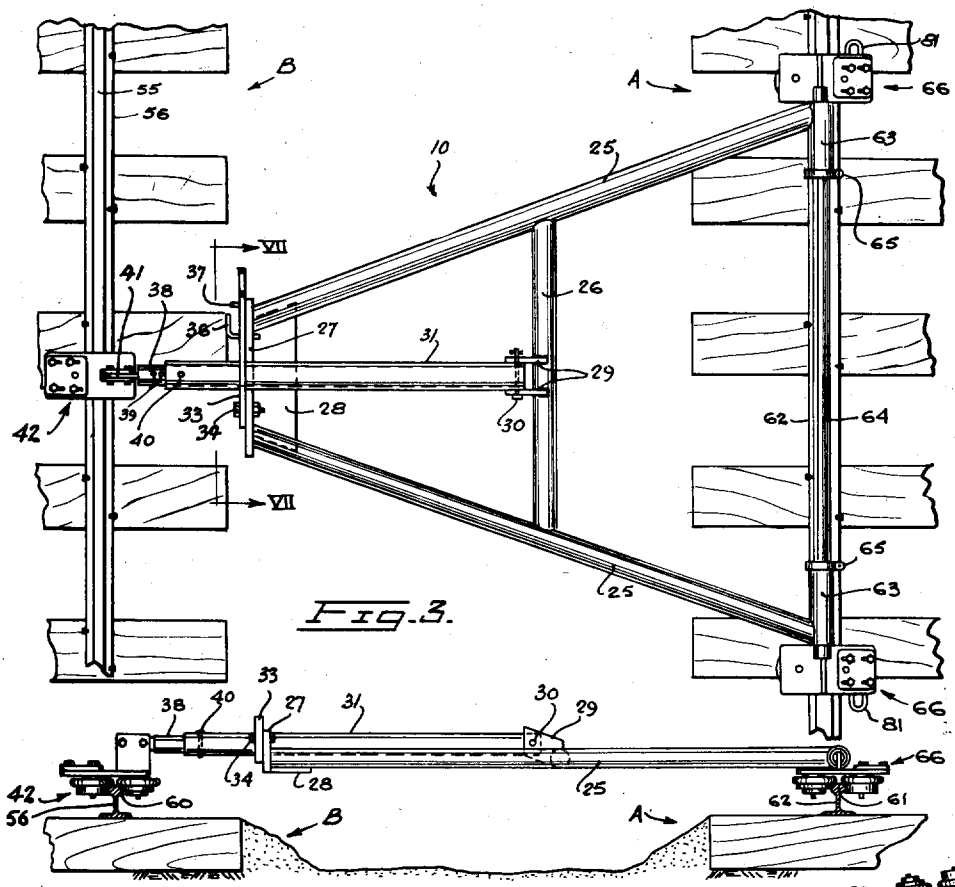


Fig. 3.

Fig. 4.

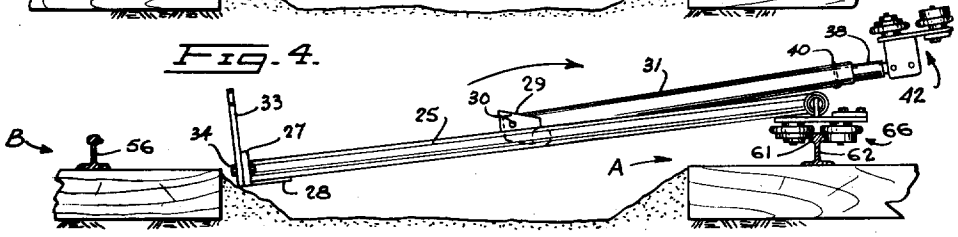


Fig. 5.

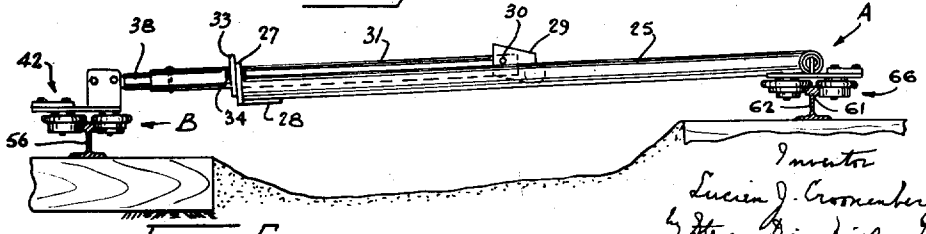


Fig. 6.

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TRACK ALIGNING METHOD FOR USE IN CONNECTION WITH BALLAST HANDLING DEVICES USED UNDER RAILROAD TRACKS

Filed April 2, 1957 4 Sheets-Sheet 3

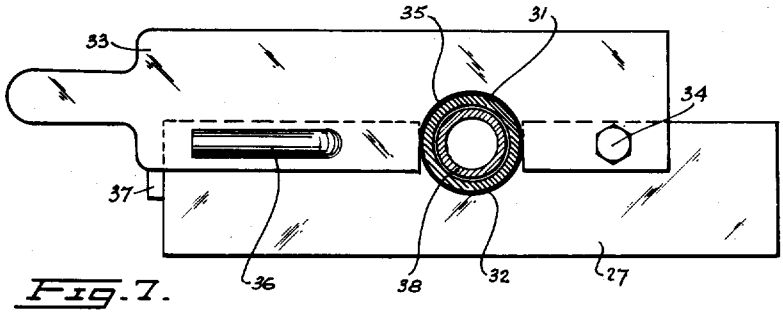


Fig. 7.

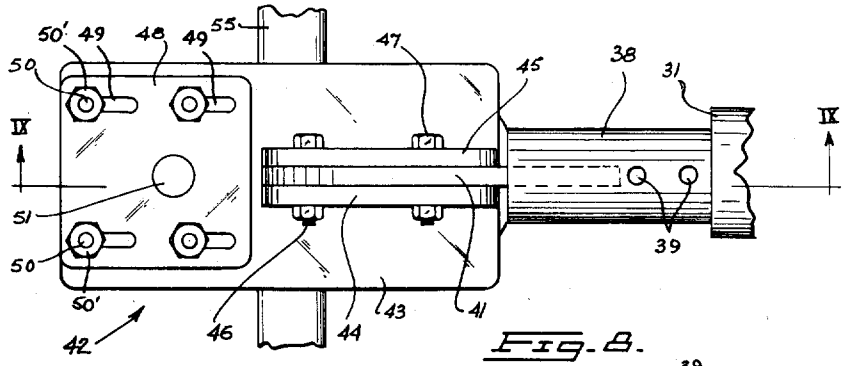


Fig. 8.

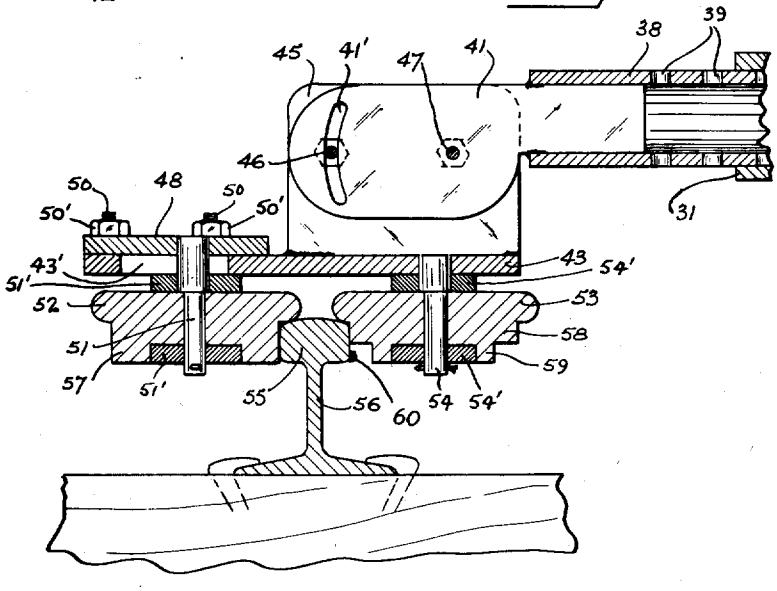


Fig. 9.

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TRACK ALIGNING METHOD FOR USE IN CONNECTION WITH BALLAST HANDLING DEVICES USED UNDER RAILROAD TRACKS

Filed April 2, 1957 4 Sheets-Sheet 4

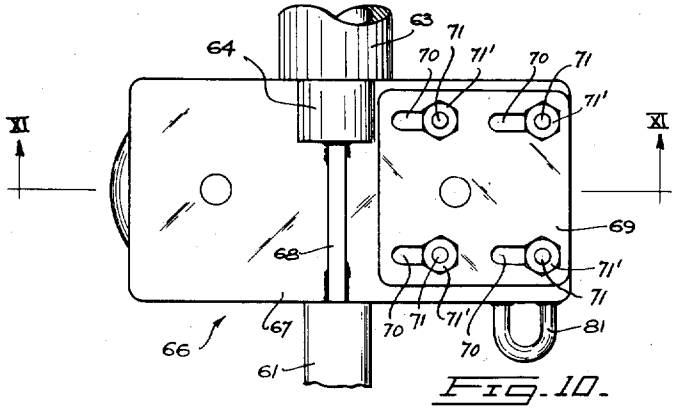


Fig. 10.

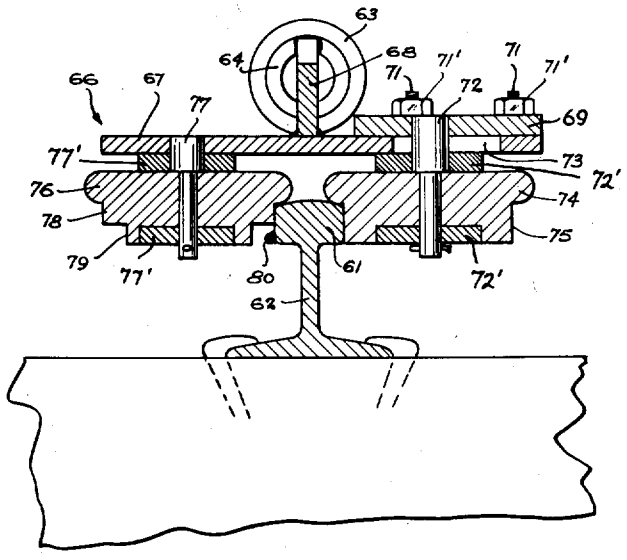


Fig. 11.

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2,921,538

TRACK ALIGNING METHOD FOR USE IN CONNECTION WITH BALLAST HANDLING DEVICES USED UNDER RAILROAD TRACKS

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Application April 2, 1957, Serial No. 650,112

2 Claims. (Cl. 104—8)

This invention relates to a method of aligning railroad tracks for use in conjunction with under-track devices of the so-called ballast sled or 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 method of utilizing 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 claims. 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 demonstrating the manner of use of a liner 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.

The structural aspects of the liner described herein are described and claimed in Christoff copending application Serial No. 650,111, filed April 2, 1957.

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 used in 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 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**.

Slidingly 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** 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:

1. In the art of performing a ballasting operation on a first track of a section of double track railroad by towing along the roadbed of said first track an under-track ballast handling device of the type adapted to pass beneath the ties while resting on said roadbed and thereby elevating a span of said first track with a forward portion of said

span immediately in advance of said device sloping upwardly thereto and a rearward portion of said span immediately in rear of said device sloping away therefrom towards the roadbed, the improvement which comprises positioning a linear device rearwardly of said under-track device on said elevated span of said first track to engage a rail of each of the pair of tracks in a manner accurately to space said tracks one from the other and causing said liner device to travel with said under-track device in such position as to engage the rail of said first track at a position in said rearward portion of said elevated span of such track and thereby to align said first track from said other track while said first track is elevated from the roadbed.

2. In the art of performing a ballasting operation on a first track of a section of double track railroad by towing along the roadbed of said first track an under-track ballast handling device of the type adapted to pass beneath the ties while resting on said roadbed and thereby elevating a span of said first track with a forward portion

of said span immediately in advance of said device sloping upwardly thereto and a rearward portion of said span immediately in the rear of said device sloping away therefrom towards the roadbed, the improvement which comprises positioning a liner device rearwardly of said under-track device on said elevated span of the first track to engage the adjacent rails of the two tracks of said double track railroad in a manner accurately to space said tracks one from the other, and causing said liner device to travel with said under-track device in such position as to engage the rail of said first track at a position in said rearward portion of said elevated span of such track and thereby to align said first track from said other track while said first track is elevated from the roadbed.

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