

**May 30, 1961**

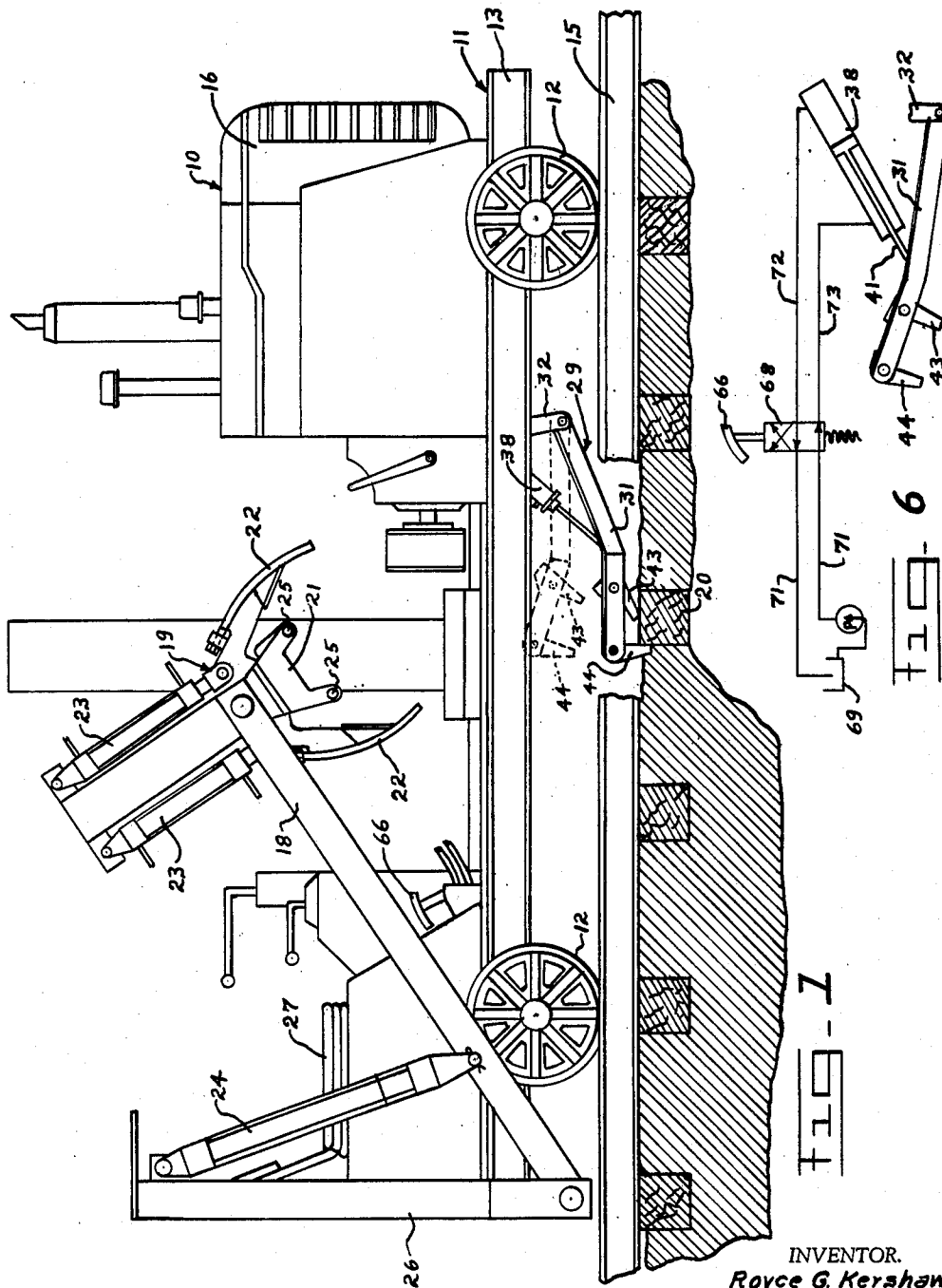
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**2,986,100**

# RAILWAY CROSSTIE DETECTOR

Filed Feb. 26, 1958

3 Sheets-Sheet 1



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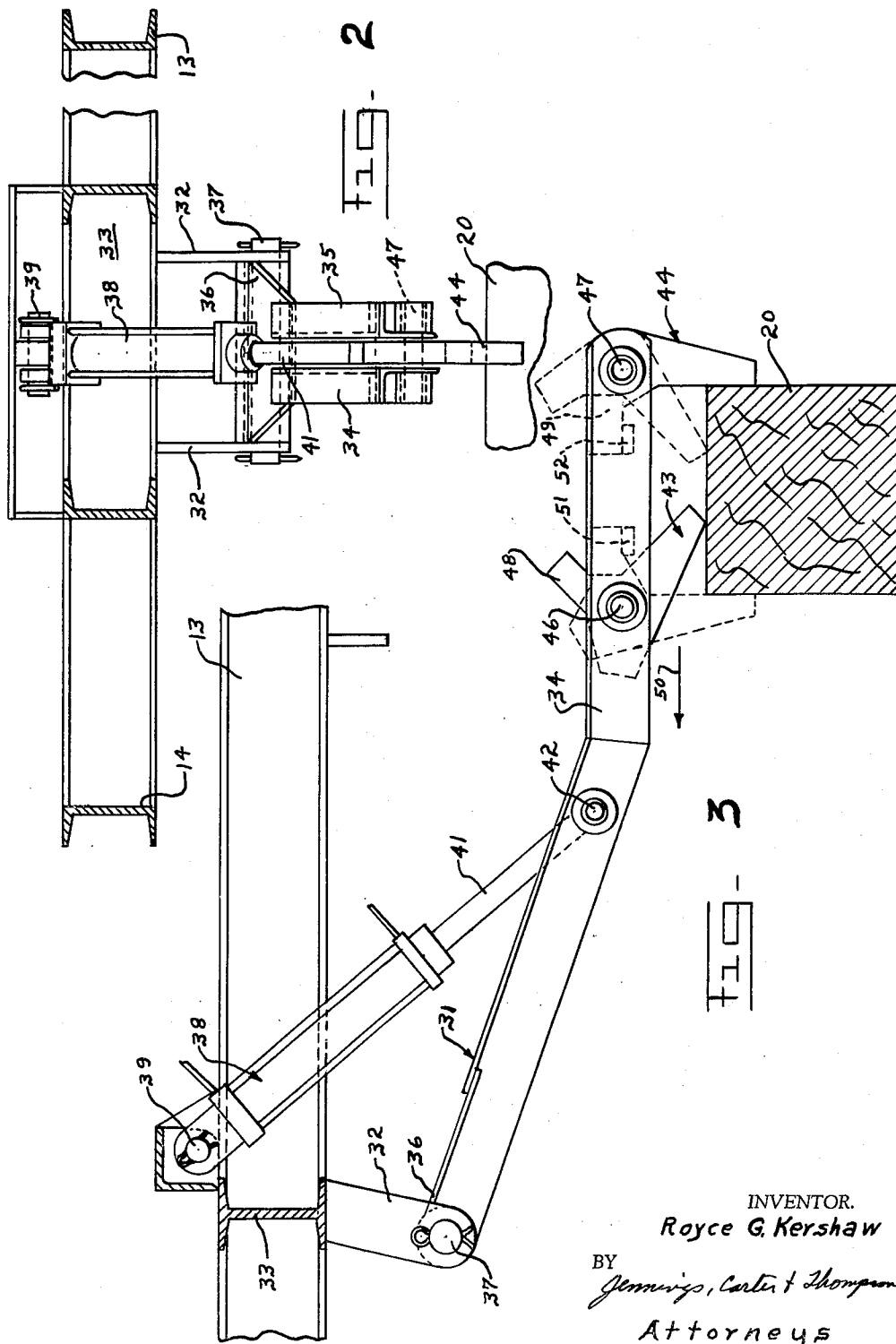
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3 Sheets-Sheet 2



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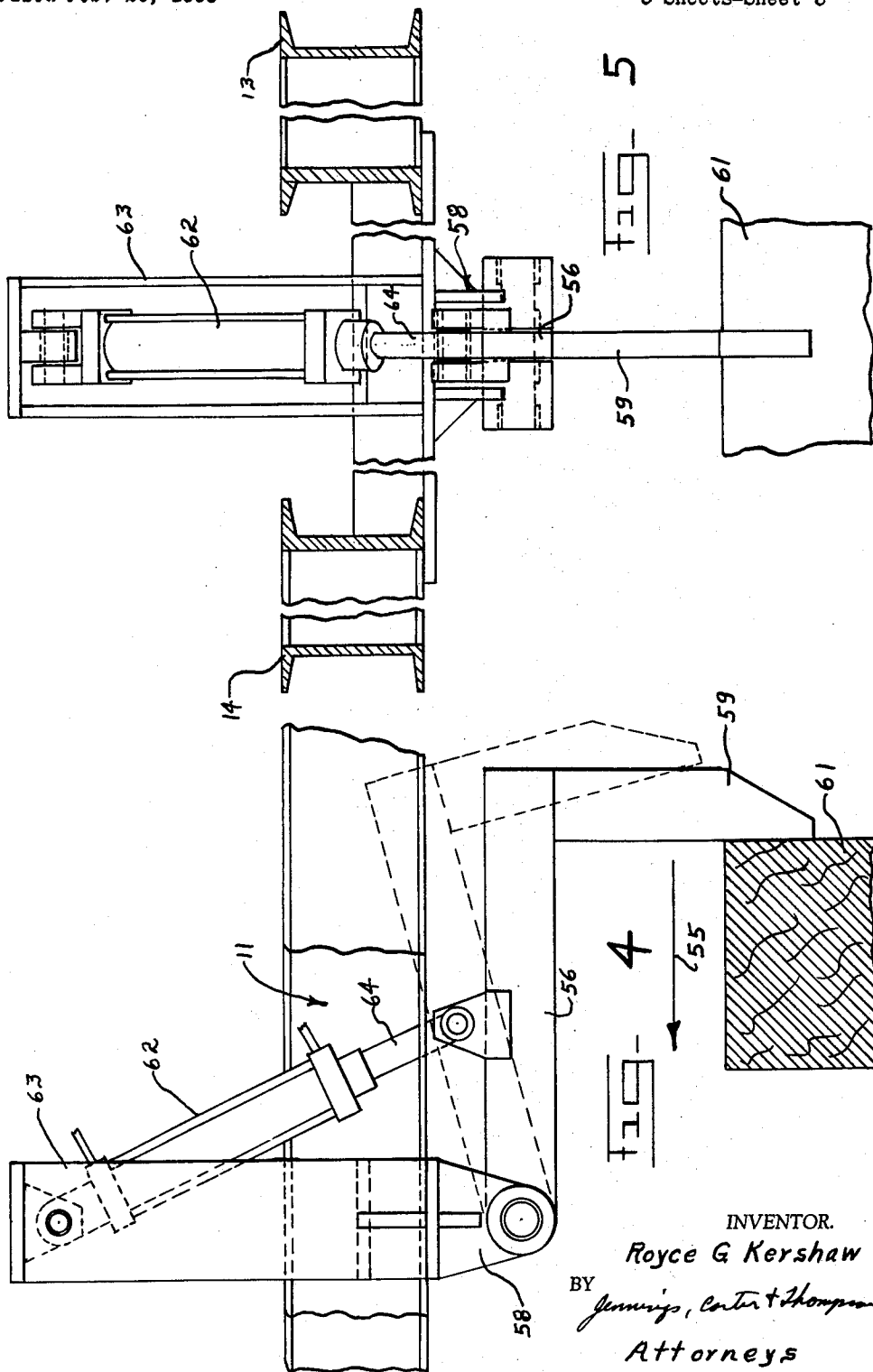
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RAILWAY CROSSTIE DETECTOR

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3 Sheets-Sheet 3



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1

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## RAILWAY CROSSTIE DETECTOR

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Filed Feb. 26, 1958, Ser. No. 717,669

2 Claims. (Cl. 104—12)

This invention relates to railway maintenance vehicles and more particularly to means for positioning working tools on a railway maintenance vehicle at or adjacent the crossties on the roadbed of a railroad.

Heretofore, working tools such as ballast implements mounted on railroad vehicles have been positioned in relation to the crossties or the spaces therebetween by sight or estimation which necessitated either the use of a workman alongside the rails indicating to the operator of the railroad vehicle when the tool was in proper working position, or an estimation by the operator as to the proper position. To my knowledge, no means for positioning accurately a working tool on a railroad vehicle relative to the crossties has been developed heretofore.

It is an object of the present invention to provide means for positioning accurately a working tool mounted on a railway vehicle in relation to the crossties, which means engages a side of the crossties and thereby restrains movement of the vehicle and positions the working tool thereon at or between the crossties.

It is a further object of the present invention to provide means for positioning in relation to the crossties a working tool mounted on a railway vehicle in either forward or backward movement of the vehicle. Thus, the positioning means engages the forward side of the crossties, namely, the side thereof from which the vehicle approaches, in either direction of travel and without modification of the positioning means in any manner.

Briefly described, my invention comprises an arm pivotally mounted on the railway vehicle for movement in a vertical plane and having a downwardly extending leg mounted thereon for engaging the forward side of the crossties on the roadbed, thereby to position a working tool on the vehicle in relation to the crossties. Further, fluid pressure means is provided for pivoting the arm about a horizontal axis so that the leg thereon may be raised and lowered relative to the crossties. Controls for the hydraulic means are arranged on the railway vehicle so as to be easily accessible to the operator of the vehicle.

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

Fig. 1 is a side elevational view of the preferred embodiment of the present invention adapted for use in either forward or backward movement of a railroad vehicle and showing a railroad vehicle having a working tool thereon;

Fig. 2 is an enlarged fragmentary elevational view of the embodiment shown in Fig. 1;

Fig. 3 is a fragmentary side elevational view of the embodiment shown in Fig. 1 and taken from the side of the railroad vehicle opposite that of Fig. 1;

Fig. 4 is a fragmentary side elevational view of a modification of the present invention adapted for use in one direction of travel only of the railroad vehicle;

Fig. 5 is a fragmentary rear elevational view of the modification shown in Fig. 4; and,

Fig. 6 is a diagram of the hydraulic system and controls

2

for my invention adapted for use with either of the embodiments shown.

Referring now to the drawings for a better understanding of my invention, I show in Fig. 1 a railroad vehicle indicated generally by the numeral 10 and comprising a vehicle main frame 11 having flanged wheels 12 thereon adapted for riding on the rails 15 of the railroad track. The vehicle main frame 11 comprises longitudinally extending side channels 13 and 14. A power plant 16 is mounted on the frame 11 for propelling the vehicle along the rails through suitable drive means (not shown).

A working tool indicated generally by the numeral 19 is mounted on a tool frame 18 which is, in turn, pivotally mounted on the vehicle 10 and adapted for positioning at the crosstie 20 of the roadbed so that it may tamp the ballast around and under the crosstie. While I have shown only one type of working tool for the purpose of illustration, it is understood that my invention is suitable for positioning various types of ballast working, tie pulling, adzing and similar tools relative to the crossties of a roadbed.

The working tool 19 may comprise a head 21 adapted for engaging the top of crosstie 20 and two tamping tools 22 oppositely arranged and adapted for tamping the ballast around crosstie 20 on each side thereof. The two tamping tools 22 are actuated by hydraulic cylinders 23 located over the tamping tools 22 and adapted for bringing the tools 22 toward each other about pivots 25 and around the crossties from the open position shown in Fig. 1. The working tool 19 is raised and lowered by a suitable hydraulic cylinder 24 arranged between the tool frame 18 and a vertical upright 26 secured to the main frame 11. The working tool 19 can be operated by controls mounted on the main frame 11 adjacent the seat 27 for the operator of the vehicle.

As it is well known in the art, it is difficult to position accurately a working tool such as the tool 19 shown in Fig. 1 over a crosstie on the roadbed of a railroad track. In order to obtain maximum efficiency from such working tool it is necessary that it be properly positioned and heretofore it has been necessary for the operator of the vehicle to estimate the location of the crosstie or for a workman alongside the track to direct the operator of the vehicle. The present invention embodying a crosstie detector does not require any approximation on the part of the operator of the railroad vehicle as it accurately positions the railway vehicle and working tool thereon in relation to the crossties of the roadbed and the cribs therebetween.

The crosstie detector shown in Fig. 1 and indicated generally by numeral 29 comprises an arm 31 pivotally connected for vertical movement at its forward end to a bracket 32. Arm 31 is shown in solid lines in Fig. 1 in engagement with crosstie 20 and in broken lines raised out of engagement with crosstie 20. Bracket 32 is located between the rails, being secured to an I beam 33 (see Figs. 2 and 3) extending between channel 13 and channel 14. Arm 31 comprises two spaced angles 34 and 35 connected at their forward ends to a sleeve 36 pivotally mounted on pivot pin 37 extending between the bracket arms 32. In order to move arm 31 relative to the top surface of the crossties, a double acting hydraulic cylinder 38 is pivotally mounted at 39 to the vehicle main frame. A piston rod 41 is pivotally mounted on arm 31 through pin 42 secured between the angles 34 and 35. Thus, actuation of hydraulic cylinder 38 from the position of arm 31 shown in Fig. 1 raises arm 31 upwardly from the crosstie 20. A pair of downwardly extending legs 43 and 44 are pivotally mounted on pins 46 and 47, respectively, on the rear portion of arm 31 between angles 34 and 35. The legs 43 and 44 are spaced on arm 31 the width of the average crosstie engaged thereby and

are provided with extensions 48 and 49, respectively. Extension 48 on leg 43 limits the pivotal movement of leg 43 by engagement with a stop 51 secured between angles 34 and 35. Likewise, extension 49 on arm 44 limits the pivotal movement thereof by engagement with a stop 52 secured between angles 34 and 35. By providing legs that are limited in pivotal movement in opposite directions, I am able to position the railroad vehicle 10 in relation to the crossties in either direction of movement thereof as leg 44 engages the forward side (i.e. the side from which the vehicle approaches) of the crosstie in the forward direction of movement of railroad vehicle 10. Leg 43 engages the forward side of the crosstie when the direction of movement of the railway vehicle 10 is reversed. The legs 43 and 44 are shown in solid lines in Fig. 3 for the direction of movement indicated by the arrow 50 while the broken line position of legs 43 and 44 is shown for an opposite direction of movement. Thus, regardless of the direction of travel of the railroad vehicle 10, I effectively position the vehicle in relation to the crossties.

In the modification of my invention shown in Figs. 4 and 5, I show a crosstie detector for use in only the direction of travel of a railroad vehicle indicated by arrow 55. An arm 56 is pivotally mounted on the main frame 11 between channels 13 and 14 through a downwardly extending bracket 58. A downwardly extending leg 59 is secured to the rear end of arm 56. Arm 56 is adapted for movement relative to a crosstie 61 by a hydraulic cylinder 62. Cylinder 62 is pivotally mounted on an upstanding bracket 63 extending upwardly from the main frame 11. A piston rod 64 of the cylinder 62 is pivotally secured to the arm 56.

For operation of the invention for either of the embodiments, a suitable hydraulic system is indicated diagrammatically in Fig. 6, in which a foot pedal 66 is provided on the railway vehicle 10 for actuating hydraulic cylinder 38, it being understood that cylinder 62 may be actuated similarly. The foot pedal 66 is located in an accessible location for the operator of the vehicle sitting on the seat 27, and the lower end thereof is connected to the plunger of a hydraulic valve 68 which controls and directs the flow of the hydraulic fluid to the hydraulic cylinder 38. A fluid reservoir 69 and a pump P are connected to the hydraulic valve through suitable connections 71. Suitable lines 72 and 73 from hydraulic valve 68 are connected to the hydraulic cylinder 38 for actuating piston rod 41. In the position of the valve 68 shown in Fig. 6, the arm 31 is in raised or non-working position. To place arm 31 in a working position, the foot pedal 66 is depressed moving the plunger of valve 68 downwardly thereby changing the direction of flow of the hydraulic fluid in lines 72 and 73 and actuating hydraulic cylinder 38 which lowers arm 31. Thus, as long as the operator holds the foot pedal 66 in depressed position, arm 31 remains in lowered working position. To move to the next succeeding crosstie from the position shown in Fig. 1, the operator releases foot pedal 66 and the valve 68 returns to the position shown in Fig. 6 thereby raising arm 31 to non-working position in which position the vehicle 10 is moved forwardly until the leg 44 clears the crosstie. When leg 44 clears the crosstie, which easily can be estimated by the operator, the operator depresses foot pedal 66 which lowers arm 31. The forward movement of railway vehicle 10 is maintained until a leg contacts the forward side of the next crosstie in which position the operator quickly depresses the clutch pedal thereby stopping forward movement of vehicle 10. As long as the vehicle 10 remains in working position at the crosstie, the operator of the vehicle keeps the foot pedal 66 depressed. For operation of the vehicle in the opposite or rearward direction the above procedure is also employed.

From the foregoing, it will be understood that I have developed a railway crosstie detector which positions accurately a working tool mounted on a railroad vehicle

at a crosstie for working between and around the crossties or on the crossties. I have also shown a device which positions a railway vehicle at a crosstie in both the forward and rearward direction of travel of the vehicle.

It is immaterial insofar as the present application is concerned as to the type of working tool positioned at or near a crosstie as the present invention works effectively for any type of working tool adapted for positioning at or adjacent the crossties of a railroad track.

While I have shown my invention in but two forms, 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 I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a railway vehicle adapted for movement along the rails of a track and having a working tool mounted thereon for positioning relative to the crossties on the roadbed, means mounting a support on the underside of the railway vehicle for vertical movement, a forward leg and a rear leg pivotally mounted on the support and spaced longitudinally of the track substantially the width of a crosstie, said legs extending downwardly from the support in a generally vertical direction, a stop adjacent each of the legs, means on each leg to engage the respective adjacent stop to prevent pivotal movement of the legs away from each other and to allow pivotal movement of the legs toward each other, one of the legs engaging the side of a crosstie and holding the vehicle thereat in each direction of vehicle travel while the other of said legs pivots out of the path of the engaged crosstie, and means on the vehicle operatively connected to the support to move the support in a generally vertical direction relative to the crossties whereby the legs may be raised and lowered relative to the top surface of the crossties on the roadbed.

2. In a railway vehicle adapted for movement along the rails of a track and having a working tool mounted thereon for positioning relative to the crossties on the roadbed, means mounting a support on the underside of the railway vehicle for vertical movement, a forward leg and a rear leg pivotally mounted on the support and spaced longitudinally of the track substantially the width of a crosstie, said legs extending downwardly from the support in a generally vertical direction, a stop adjacent each of the legs, means on each leg to engage the respective adjacent stop to prevent pivotal movement of the legs away from each other and to allow pivotal movement of the legs toward each other, one of the legs engaging the side of a crosstie and holding the vehicle thereat in each direction of vehicle travel while the other of said legs pivots out of the path of the engaged crosstie, fluid pressure means for moving said support in a generally vertical direction and having relatively movable parts, one of said parts being connected to said support and the other of said parts being secured to the vehicle, and controls operatively connected to said fluid pressure means for actuation thereof.

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