Dec. 27, 1960 R. G. KERSHAW 2,965,986

BALLAST DISTRIBUTING APPARATUS FOR RAILROADS

Filed March 17, 1958 4 Sheets-Sheet 1

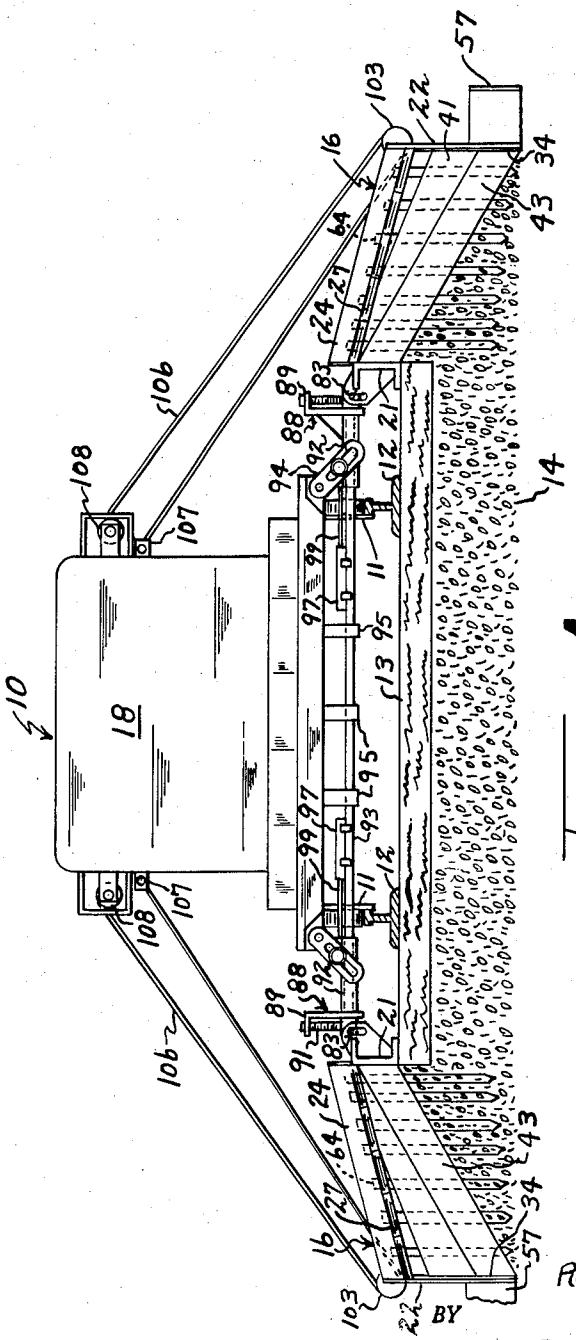



FIG. 1

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BALLAST DISTRIBUTING APPARATUS FOR RAILROADS

Filed March 17, 1958 4 Sheets-Sheet 2

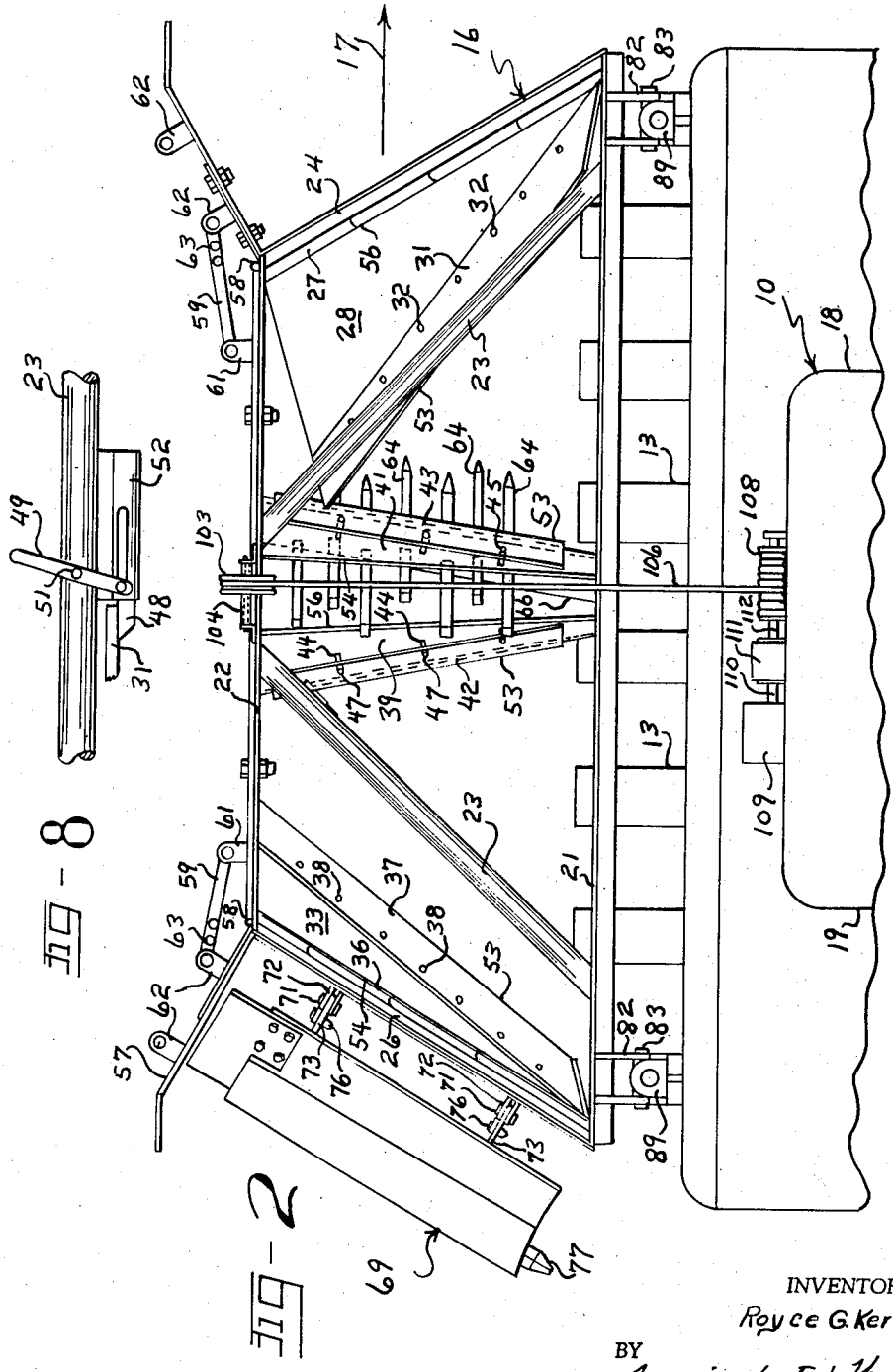


FIG - 8



FIG - 2

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BALLAST DISTRIBUTING APPARATUS FOR RAILROADS

Filed March 17, 1958 4 Sheets-Sheet 3

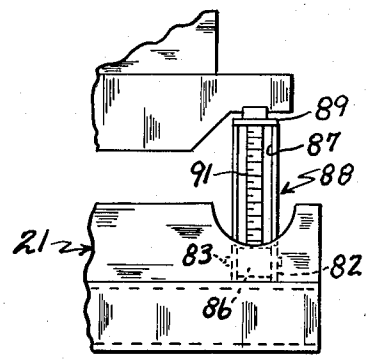



FIG-7

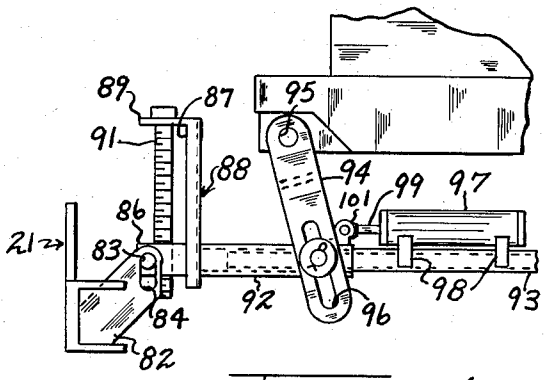



FIG-6

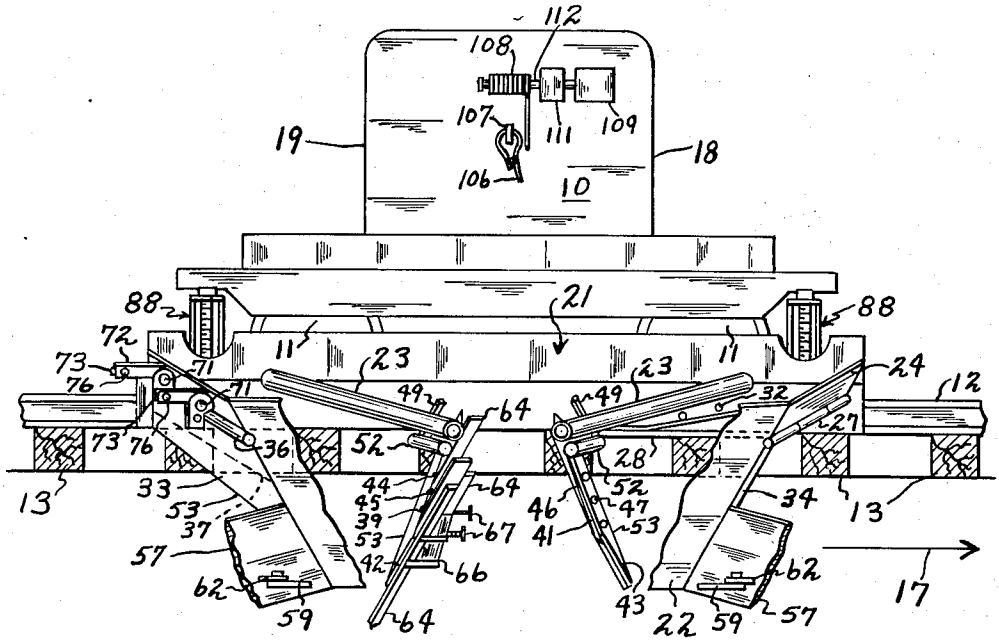



FIG-3

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BALLAST DISTRIBUTING APPARATUS FOR RAILROADS

Filed March 17, 1958 4 Sheets-Sheet 4

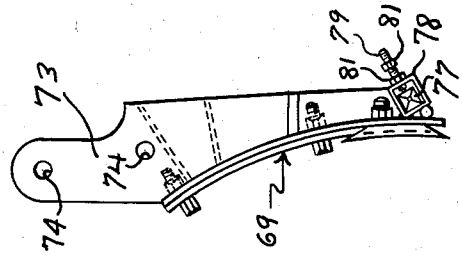



FIG - 4

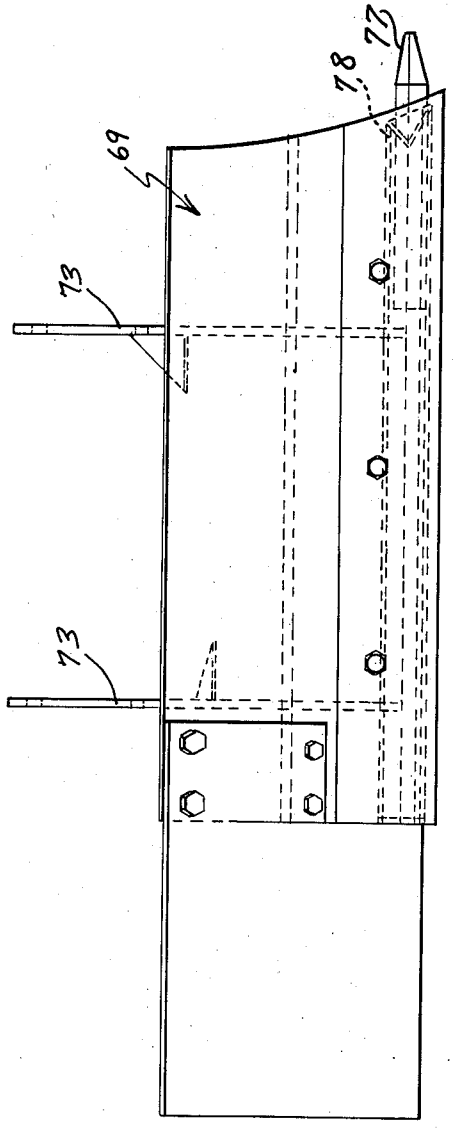



FIG - 5

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United States Patent Office 2,965,986
Patented Dec. 27, 1960



2,965,986

# BALLAST DISTRIBUTING APPARATUS FOR RAILROADS

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Filed Mar. 17, 1958, Ser. No. 721,835

11 Claims. (Cl. 37—105)

This invention relates to ballast distributing apparatus for railroads and more particularly to such apparatus for use outwardly of the ends of the crossties in either direction of travel on the railroad track.

Heretofore, if desired to use ballast distributing apparatus outwardly from the ends of the crossties in a reverse direction of travel, it was necessary to raise the vehicle carrying the apparatus from the track and pivot the vehicle with the apparatus thereon 180° for travel in the reverse direction. Such an operation was time consuming and required the employment of several workmen to turn the apparatus around.

The present invention comprises a ballast distributing unit which may be attached to each side of a railroad vehicle and operated in either direction of travel without any raising or pivoting of the vehicle. The units are interchangeable and substantially identical, the only difference being that one is adapted for use on one side of the vehicle in one direction of travel and the other on the opposite side of the vehicle in the same direction of travel. When the direction of travel for the railroad vehicle is reversed, one of the ballast engaging blades is raised from ballast engaging relation and another ballast engaging blade is lowered to ballast engaging relation. In some instances, it may be desirable to reverse the travel of the railroad vehicle without raising any of the ballast engaging blades from ballast engaging relation.

Briefly described, my invention comprises separate ballast distributing units attached to each side of a railroad vehicle for distributing ballast outwardly from the ends of the crossties. Each ballast distributing unit has a pair of parallel vertical plates extending substantially parallel to the rails of the railroad track with one of the plates being disposed adjacent the ends of the crossties and the other plate being disposed outwardly of the ends of the crossties. A forward ballast blade is mounted between the vertical plates on the forward portion of the apparatus and is adapted for engaging ballast in the reverse direction of travel of the apparatus while being removed from ballast engaging relation in the forward direction of travel of the apparatus. A rear ballast blade is mounted between the vertical plates on the rear portion of the apparatus and engages ballast in the forward direction of travel of the apparatus while normally being removed from ballast engaging relation in the reverse travel of the apparatus. A pair of intermediate ballast engaging blades is positioned between the forward and rear blades and extends between the vertical plates.

The inclination and slope of the ballast blades is such that the ballast blades engaging the ballast in the forward



direction of travel of the apparatus direct the ballast inwardly toward the ends of the crossties. Likewise, the ballast blades engaging the ballast in the reverse direction of travel of the apparatus direct the ballast inwardly toward the ends of the crossties.

For scarifying and deweeding the ballast before it is regulated and distributed by the ballast blades, vertically adjustable scarifying teeth are positioned between the vertical plates and are adapted for engaging the ballast in several passes of the vehicle before the ballast blades distribute the ballast.

If desired, a ballast removing or plow away blade may be provided on the ballast distributing apparatus for moving the ballast outwardly from the ends of the crossties before the ballast is distributed by the ballast blades. Means is arranged on the inner end of the plow away blade for reaching under the ends of the crossties and breaking up any mud pockets that may have been formed thereat.

Apparatus illustrating the features of my invention is shown on the accompanying drawings forming a part of this application in which:

Fig. 1 is a front elevational view of my invention showing ballast distributing apparatus on each side of a railway vehicle for distributing and regulating ballast outwardly from the ends of the crossties;

Fig. 2 is a top plan view of the apparatus on one side of the railroad vehicle for distributing and regulating ballast on one side of the railroad vehicle, and showing only a portion of the vehicle;

Fig. 3 is a side elevational view of the apparatus shown in Fig. 2 with the outer plate member broken away to view the ballast blades;

Fig. 4 is a side elevational view of a ballast removing or plow away blade for removing ballast from the ends of the crossties;

Fig. 5 is a front elevational view of the ballast blade shown in Fig. 4;

Fig. 6 is a fragmentary, rear elevational view of the means for raising and lowering the apparatus of my invention and for moving the apparatus inwardly and outwardly of the vehicle;

Fig. 7 is a side elevational view of the adjusting apparatus shown in Fig. 6; and

Fig. 8 is a fragmentary, elevational view of the means for securing the forward and rear ballast blades of my invention in raised position.

Referring now in detail to the drawings, and more particularly to Fig. 1, I show a railroad vehicle, indicated generally by the numeral **10**, having flanged wheels **11** thereon for riding on the rails **12**. The rails **12** are supported on crossties **13** which rest, in turn, on the roadbed **14** comprising ballast.

As is well known in railroading, the roadbed of the railroad track becomes packed down after an extended period of use due to the weight and frequency of the passing traffic on the rails. Further, weeds and other vegetation tend to grow beneath and in the roadbed and frequently extend upwardly between the particles of ballast. Also, other foreign matter is deposited on the roadbed over a period of time. The plant growth and foreign matter obstructs proper drainage of the ballast which results in damage to the crossties. For this purpose, it is desirable to scarify the ballast to break up

deposits of foreign matter and vegetation as well as breaking up the deposits of ballast and loosening and spreading the ballast evenly over the roadbed outwardly of the ends of the crossties. In addition, fresh ballast is sometimes required to build the roadbed up after it has been packed down or to widen the roadbed shoulders as well.

The apparatus embodying the present invention distributes the ballast evenly along the shoulders of the roadbed and scarifies the ballast, thus removing vegetation and deposits of foreign matter in the ballast as well as loosening the ballast. Heretofore, such apparatus has been adapted for travel in only a forward direction, and if desired to move in a reverse direction, the entire apparatus had to be lifted from the railroad track and pivoted 180°, then placed on the track again for engaging the ballast in working relation.

The present invention is particularly adapted for travel in either a forward or a reverse direction without the necessity of lifting the vehicle from the track or moving the vehicle in any manner. The only change necessary in order to reverse the direction of travel of the present invention in working position is the pivoting of the front and back ballast engaging blades which can be easily accomplished by a single workman in a minimum of time.

A wing assembly indicated generally by the numeral **16** is attached to each side of the railroad vehicle **10**, as shown in Fig. 1, and is adapted for engaging ballast outwardly from the ends of crossties. It is understood that the wing assembly **16** on one side of the vehicle **10** is substantially identical to the wing assembly **16** on the other side of the vehicle **10**. Thus, for the purpose of illustration, only one of the wing assemblies **16** is shown in detail. Referring to Figs. 2 and 3, the arrow **17** indicates the forward direction of travel of the vehicle **10**, the forward side of vehicle **10** being indicated by the numeral **18** and the rear side being indicated by the numeral **19**. The wing assembly **16** comprises an inner vertical plate member **21** extending in a direction parallel to the rails **12** and disposed adjacent the ends of the crossties. An outer vertical plate member **22** is spaced from the member **21** and extends substantially parallel thereto in a direction parallel to the rails **12**. The outer plate member **22** is disposed outwardly from the ends of the crossties at substantially the outer edge of the roadbed **14**.

Intermediate cross members **23** extend between and connect the inner plate member **21** to the outer plate member **22**. Front cross member **24** and rear cross member **26** extend between the members **21** and **22** at the front and rear ends thereof, respectively.

The front cross member **24** has a hinge **27** on the lower edge thereof and a front blade supporting plate **28** is pivotally connected to the hinge **27** through a pin. A front ballast engaging blade **31** is secured to the supporting plate **28** by suitable means such as rivets **32**.

A rear blade supporting plate **33** is pivotally connected to the rear end cross member **26** by a pin extending through a hinge **36** on the lower edge of the cross member **26** and the upper edge of plate **33**. A rear ballast engaging blade **37** is secured to the blade supporting plate **33** by suitable means such as rivets **38**. A stop **34** (see Figs. 1 and 3) is secured to the outer plate **22** at the front and rear ends thereof so that the front and rear blade plates **28** and **33** will abut thereagainst and limit the downward pivotal movement of the blades **31** and **37**.

Intermediate blade supporting plates **39** and **41** are arranged between the plate members **21** and **22** and have intermediate ballast engaging blades **42** and **43**, respectively, secured at the lower edge thereof and adjusted through slots **44** and **46** in the supporting plates **39** and **41** respectively. Suitable bolts **45** and **47** are provided to secure the blades **42** and **43**, respectively, to the supporting plates **39** and **41**. Normally, the intermediate blades **42** and **43** are arranged at the same height so that the vehicle and apparatus may be moved in either direction of travel without any adjusting of the blades **42** and **43** being necessary.

As shown in Figs. 2 and 3, the front ballast engaging blade **31** is pivoted out of ballast engaging relation in the forward direction of travel of the apparatus, while the rear ballast blade **37** is in ballast engaging relation in the forward direction of travel. It is understood that in the event the apparatus is reversed from the direction shown in Figs. 2 and 3 to move in a reverse or rearward direction, the front blade **31** will be lowered to ballast engaging relation while the rear blade **37** will be removed from ballast engaging relation.

To retain the blades **31** and **37** in removed non-working position, means are provided on the cross members **23**. As shown in Fig. 8, such means comprises a spring actuated plunger **48** which is adapted for engaging the underside of the blade **31**. Plunger **48** can be moved out of engagement with the blade **31** by actuation of the handle **49** which is pivotally mounted at **51** to the cross member **23** thereby compressing a spring (not shown) in the housing **52**.

The shoulders of the roadbed **14** slope downwardly from the ends of the crossties to the outer edge of the roadbed and for this reason, the ballast blades **31**, **37**, **42** and **43** have their lower edge **53** sloping downwardly from the ends of the crossties to the outer edge of the roadbed.

It is desirable that the ballast engaging blades pull the ballast inwardly from the edge of the roadbed toward the ends of the crossties so that the ballast may be evenly distributed for spreading along the shoulders of the roadbed. For this purpose, the outer ends of the rear ballast engaging blade **37** and the intermediate blade **43** are arranged forwardly of the inner ends of the blades **37** and **43**. It is understood that the outer ends are adjacent outer plate member **22** while the inner ends are adjacent the inner plate member **21**. Thus, in the forward direction of travel indicated by the arrow **17**, the ballast will first be engaged by blade **43** which will tend to pull the ballast inwardly toward the ends of the crossties; next, the intermediate blade **42** will engage the ballast but will have practically no effect on the ballast in the forward direction of travel. The ballast engaging blade **37** will thereafter engage the ballast and also tend to pull the ballast inwardly toward the ends of the crossties.

The outer ends of the front ballast engaging blade **31** and the intermediate ballast engaging blade **42** which are positioned adjacent the plate member **22** are arranged rearwardly of the inner ends disposed adjacent the inner vertical plate member **21**. Thus, in the reverse or opposite direction of travel from that shown in Figs. 2 and 3, the intermediate blade **42** will first engage the ballast since blade **37** will be raised out of ballast engaging relation. Blade **42** will tend to pull the ballast inwardly towards the ends of the crossties and intermediate blade **43** will have substantially no effect on the ballast in the rearward direction insofar as pulling the ballast away from the ends of the crossties. The forward ballast blade **31** will be in ballast engaging relation in the reverse direction of travel and will engage the ballast and also tend to pull the ballast inwardly towards the ends of the crossties.

The wing assemblies **16** are held in ballast engaging relation by the ballast which tends to pile up in front of the ballast engaging blades and thereby hold the blades in ballast digging relation. To hold the baldes in ballast digging relation and to allow the ballast to pile up in front of the blades and on the blades, it is necessary that the blades be inclined rearwardly to the direction of travel. Thus in the forward direction of travel of the vehicle, the lower edges **53** of intermediate blade **43**

and rear blade 37 are positioned forwardly of the upper edges 54 of the supporting plates 41 and 33 for blades 43 and 37, respectively. Therefore, in the forward direction of travel, ballast tends to rest on the exposed surface of the blades and hold the wing assembly in ballast engaging relation.

Likewise, the lower edges 53 of intermediate blade 42 and forward blade 31 are positioned rearwardly of the upper edge 56 of the supporting plates 39 and 28 for blades 42 and 31, respectively. Thus, in the reverse or rearward direction of travel, ballast will tend to pile on the upper surface of blades 31 and 42 and thereby hold the wing assembly 16 in the ballast, it being understood that the rear ballast engaging blade 37 is raised out of ballast engaging relation in the reverse direction of travel.

To pull the ballast inwardly from the outer edge of the roadbed so that it may be engaged by the ballast engaging blades, and to keep any ballast that may be deflected outwardly of the roadbed by the ballast engaging blades, deflector plates 57 are pivotally mounted at 58 (see Fig. 2) on each end of the wing assemblies 16. The deflector plates 57 are secured in position by an arm 59 extending between brackets 61 and 62 on the outer plate member 22 and the deflector plate 57 respectively. If desired, spaced apertures 63 may be disposed in the arms 59 for adjusting the deflector plates 57 to the desired angle.

For scarifying the ballast and removing the vegetation and any hard deposits of ballast, scarifying teeth 64 extend through flanges 66 (see Fig. 3) on the intermediate supporting plate 39 and are vertically adjustable by means of set screws 67.

A ballast removing or plow away blade, indicated generally by the numeral 69, is shown in raised non-working position in Fig. 2. The ballast removing blade 69 is adapted for removing ballast from the ends of crossties outwardly to the edge of the roadbed and is normally employed before the ballast engaging blades are positioned in working relation. Blade 69 is pivotally mounted at 71 to brackets 72 extending from the rear end cross member 26 by arms 73 on the blade 69. As shown in Figs. 4 and 5, apertures 74 are arranged through arms 73 and to secure the blade 69 in raised position as shown in Fig. 2, a pin 76 is extended through an arm of the brackets 72 and the lower aperture 74. To lower the blade 69 to working position, the pins 76 are removed and the blade 69 pivoted about the pivots 71 to lowered position. In this position, the pins 76 are again positioned through the lower apertures 74 and a downwardly extending arm of the brackets 72 to hold the blade 69 in lowered ballast engaging position.

It is common for mud deposits to be formed directly under the crossties at the ends thereof and for this purpose a horizontally adjustable extension 77 is arranged on the inner lower end of the blade 69. The extension 77 is housed in a horizontal housing 78 which is secured to the blade member 69 and is adjustable therein by means of set screw 79 and set nuts 81 (see Fig. 4). When the blade 69 is lowered to working position, the extension 77 may, if desired, be extended as shown in Figs. 4 and 5 so that it will reach under the ends of the crossties directly adjacent the ends thereof and will break up any mud deposits or other deposits of foreign matter thereat. It is to be realized that the blade 69 is normally lowered to working position after the scarifying tools 64 have engaged the ballast and before the ballast engaging blades distribute or spread the ballast.

For mounting the wing assemblies 16 on the vehicle 10, reference is made to Figs. 6 and 7 in which the inner vertical plate member 21 is shown having brackets 82 thereon pivotally mounted at 83 through slots 84. The brackets 82 are mounted on a sliding block member 86 through the pivot 83. The block member 86 is adapted for sliding vertically in a slideway 87 formed in the vertical member 88. An upper extension 89 extends outwardly from the vertical member 88 and an adjusting screw 91 extends through the extension 89 and through the sliding block member 86. Thus, upon the turning of the adjusting screw 91, the slide block 86 will be moved vertically in the slideway 87 and the wing assembly 16 will likewise be moved in a substantially vertical plane.

Vertical member 88 is welded to a horizontal box channel member 92 which slidably telescopes over a horizontal box channel member 93 (see Fig. 1) which is fixed by brackets 95 to the underside of vehicle 10. Links 94 are pivotally connected to the vehicle 10 by a pin 95 and tend to guide the horizontal member 92 inwardly and outwardly from the vehicle 10 as well as providing support therefor. A slot 96 is arranged in the links 94 for allowing the horizontal member 92 to move horizontally in alignment with the horizontal member 93.

To move the horizontal member 92 inwardly and outwardly of the vehicle 10, a hydraulic cylinder 97 is mounted on the horizontal member 93 by suitable brackets 98, and a piston rod 99 extends therefrom to a bracket 101 on the top side of the horizontal member 93. Thus, upon actuation of the hydraulic cylinder 97, the wing assemblies 16 move correspondingly.

To pivot the wing assemblies 16 to non-working position from the working position shown in Fig. 1, a pulley 103 (see also Fig. 2) is mounted on the outer plate member 22 on axle 104. A cable 106 is secured at one end to a bracket 107 on the vehicle 10 and extends around the pulley 103 to a drum 108 mounted on the side of the vehicle 10. The drum 108 is adapted for rotating to wind cable 106 thereon and thereby raise the wing assembly 16 about the pivot 83. For accomplishing this, a fluid motor 109 is mounted on the side of vehicle 10 and has a shaft 110 extending therefrom to a gear reducer 111 which, in turn, has an output shaft 112 extending therefrom for rotating the dum 108 and thereby winding or unwinding the cable 106.

In operation, my reversible wing assembly is employed as follows. First, in the beginning of a ballast regulating operation on a roadbed in which the ballast has been packed down and vegetation has grown, one or both wing assemblies 16 with the scarifying teeth in ballast engaging relation, is lowered to a position with the lower end of the teeth about on a level with the bottom of the crossties. In this position the first pass of the wing assembly is made. On the next pass, the wing is lowered so that the teeth engage the ballast at a lower depth and this procedure is followed until the ballast has been scarified to the proper depth. It should be noted that in this position, the ballast engaging blades and the plow away blade are not in ballast engaging relation.

Next, the scarifying teeth are raised to inoperable position and the plow away blade 69 is lowered to working position. The vehicle 10 is then operated in the reverse direction so that the plow away blade 69 tends to remove the ballast outwardly from the ends of the crossties. A second pass in reverse direction may be necessary to remove the ballast sufficiently from the ends of the crossties. On the final pass of the vehicle 10 with the plow away blade 69 lowered, the extension 77 on the blade 69 is positioned so that it will reach under the ends of the crossties and thereby remove any mud deposits or other deposits of foreign matter from under the crosstie ends. After this trip, the plow away blade 69 is raised to non-working position in which position it remains for the remainder of the ballast operation. In some instances, it might not be desirable to use the plow away blade 69 and it may be desirable to lower the wing assembly 16 with the ballast engaging blades in working position directly after the scarifying operation, or in some instances it might not be necessary to use either the scarifying teeth or the plow away blade.

Normally, after the plow away blade is used, fresh ballast is distributed in the center of the track from

hopper cars or other apparatus, and is distributed in the center of the track by suitable means, such as a plow.

After the ballast has been unloaded, the wing assemblies **16** are lowered to distribute or spread the ballast on the shoulders of the roadbed outwardly from the ends of the crossties. It is understood that the wing assemblies **16** may be employed without the use of fresh ballast. The wing assemblies **16** are raised a few inches above the crossties during the first pass of the vehicle **10** and are gradually lowered during succeeding passes of the vehicle **10**. It is evident that the first pass of the vehicle **10** can be made in a forward direction with the blades **37** and **43** engaging the ballast, and then the next pass of the vehicle can be made in the reverse direction of travel with the blades **31** and **42** engaging the ballast. All that is necessary is that the front ballast blade **31** be raised to non-working position during the forward travel of the vehicle **10** and that the rear ballast blade **37** be removed from ballast engaging relation during the reverse travel of the vehicle **10** while the ballast blade **31** is lowered to working position.

From the foregoing, it will be obvious that I have devised an apparatus for distributing and spreading ballast outwardly from the ends of the crossties which can be used in either direction of travel of the vehicle carrying the distributing apparatus. It is not necessary to move or adjust the railroad vehicle carrying the apparatus in any manner and the only operation required is the simple pivoting of the front and rear ballast engaging blades which can be performed in a minimum of time and with a minimum of effort. It is evident that my invention will save considerable time from the prior art apparatus which required the ballast spreading equipment to be moved to an opposite side of the track before an operation in an opposite direction could be accomplished.

While I have shown my 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 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 apparatus for operating upon ballast adjacent the ends of the crossties of a railroad track in both forward and reverse directions of travel, a pair of spaced generally vertical members extending substantially parallel to the rails of the railroad track, one of said members being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, a forward ballast blade mounted between said members and engaging ballast in the reverse direction of travel of the apparatus and being removed from ballast engaging relation in the forward direction of travel of the apparatus, and a rear ballast blade mounted between said members and engaging ballast in the forward direction of travel of the apparatus and being removed from ballast engaging relation in the reverse travel of the apparatus, said forward blade having its outer end disposed rearwardly of its inner end and said rear blade having its outer end disposed forwardly of its inner end, the lower edge portion of said forward and rear blades sloping downwardly from the ends of the crossties.

2. In apparatus for operating upon ballast adjacent the ends of the crossties of a railroad track in both forward and reverse directions of travel, a pair of spaced vertical plates extending substantially parallel to the rails of the railroad track, one of said plates being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, a forward ballast blade mounted between said vertical plates and engaging ballast in the reverse direction of travel of the apparatus and being removed from ballast engaging relation in the forward direction of the apparatus, said forward blade having its outer end disposed rearwardly of its inner end and its upper edge portion disposed forwardly of its lower edge portion, said lower edge portion sloping downwardly from the ends of the crossties, and a rear ballast blade mounted between said vertical plates and engaging ballast in the forward direction of travel of the apparatus and being removed from ballast engaging relation in the reverse direction of travel of the apparatus, said rear blade having its outer end disposed forwardly of its inner end and its upper edge portion disposed rearwardly of its lower edge portion, said rear blade lower edge portion sloping downwardly from the ends of the crossties.

3. In apparatus for operating upon ballast adjacent the ends of crossties of a railroad track in both forward and reverse directions of travel, a pair of spaced vertical plates extending substantially parallel to the rails of the railroad track, one of said plates being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, a forward ballast blade mounted between said vertical plates and engaging ballast in the reverse direction of travel of the apparatus and being removed from ballast engaging relation in the forward direction of travel of the apparatus, said forward blade having a lower edge portion sloping downwardly from the ends of the crossties, a rear ballast blade mounted between said vertical plates and engaging ballast in the forward direction of travel of the apparatus and being removed from ballast engaging relation in the reverse direction of travel of the apparatus, said rear blade having a lower edge portion sloping downwardly from the ends of the crossties, and a pair of spaced intermediate blades disposed between said forward and rear blades and extending between said vertical plates with the lower edge portions thereof sloping downwardly from the crosstie ends.

4. In apparatus for operating upon ballast adjacent the ends of crossties of a railroad track in both forward and reverse directions of travel, a pair of spaced vertical plates extending substantially parallel to the rails of the railroad track, one of said plates being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, a forward ballast blade mounted between said vertical plates and engaging ballast in the reverse direction of travel of the apparatus and being removed from ballast engaging relation in the forward direction of travel of the apparatus, said forward blade having its outer end disposed rearwardly of its inner end and its upper edge portion disposed forwardly of its lower edge portion, said lower edge portion sloping downwardly from the ends of the crossties, a rear ballast blade mounted between said vertical plates and engaging ballast in the forward direction of travel of the apparatus and being removed from ballast engaging relation in the reverse direction of travel of the apparatus, said rear blade having its outer end disposed forwardly of its inner end and its upper edge portion disposed rearwardly of its lower edge portion, said rear blade lower edge portion sloping downwardly from the ends of the crossties, a pair of spaced intermediate blades disposed between said forward and rear blades and extending between said vertical plates with the lower edge portions thereof sloping downwardly from the crosstie ends, one of said intermediate blades being adjacent the forward blade and having its outer end disposed forwardly of its inner end and its upper edge portion disposed rearwardly of its lower edge portion, the other of said intermediate blades being adjacent the rear blade and having its outer end disposed rearwardly of its inner end and its upper edge portion disposed forwardly of its lower edge portion.

5. In apparatus for operating upon ballast adjacent the ends of the crossties of a railroad track in both forward and reverse directions of travel, a pair of spaced vertical plates extending substantially parallel to the rails of the railroad track, one of said plates being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, cross members ex-

tending between and connecting said vertical plates, a forward ballast engaging blade pivotally mounted on one of said cross members at the forward end of said vertical plates and extending between said vertical plates, said forward blade having its outer end disposed rearwardly of its inner end and its upper edge portion disposed forwardly of its lower edge portion, said lower edge portion sloping downwardly from the ends of the crossties, and a rear ballast engaging blade pivotally mounted on another of said cross members at the rear end of said vertical plates and extending between said vertical plates, said rear blade having its outer end disposed forwardly of its inner end and its upper edge portion disposed rearwardly of its lower edge portion, said rear blade lower edge portion sloping downwardly from the ends of the crossties, said forward blade being pivoted out of engagement with the ballast in the forward direction of travel of the apparatus, and said rear blade being pivoted out of engagement with the ballast in the reverse direction of travel of the apparatus.

6. In apparatus as defined in claim 5 and further characterized in that releasable means are positioned on said cross members for retaining said forward and rear blades out of engagement with the ballast.

7. In apparatus for operating upon ballast adjacent the ends of the crossties of a railroad track in both forward and reverse directions of travel, a railroad vehicle, a wing assembly attached to a side of the railroad vehicle and comprising a pair of spaced substantially vertical plates extending substantially parallel to the rails of the railroad track, one of said plates being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, a forward ballast blade mounted between said vertical plates and engaging ballast in the reverse direction of travel of the apparatus and being removed from ballast engaging relation in the forward direction of travel of the apparatus, said forward blade having its lower edge portion sloping downwardly from the ends of the crossties, a rear ballast blade mounted between said vertical plates and engaging ballast in the forward direction of travel of the apparatus and being removed from ballast engaging relation in the reverse direction of travel of the apparatus, said rear blade having its lower edge portion sloping downwardly from the ends of the crossties, means to move said wing assembly inwardly and outwardly of the vehicle in a substantially horizontal plane, and means to raise and lower said wing assembly in a substantially vertical plane relative to the vehicle.

8. In apparatus as defined in claim 7 and further characterized in that said wing assembly is pivotally mounted on said vehicle for movement between raised non-working position and lowered ballast engaging working position.

9. In apparatus for operating upon ballast adjacent the ends of crossties of a railroad track in both forward and reverse directions of travel, a railroad vehicle, a wing assembly attached to a side of the railroad vehicle and comprising a pair of spaced vertical plates extending substantially parallel to the rails of the railroad track, one of said plates being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, a forward ballast blade mounted between said vertical plates and engaging ballast in the reverse direction of travel of the apparatus and being removed from ballast engaging relation in the forward direction of travel of the apparatus, said forward blade having its outer end disposed rearwardly of its inner end and its upper edge portion disposed forwardly of its lower edge portion, said lower edge portion sloping downwardly from the ends of the crossties, a rear ballast blade mounted between said vertical plates and engaging ballast in the forward direction of travel of the apparatus and being removed from ballast engaging relation in the reverse direction of travel of the apparatus, said rear blade having its outer end disposed forwardly of its inner end and its upper edge portion disposed rearwardly of its lower edge portion, said rear blade lower edge portion sloping downwardly from the ends of the crossties, a pair of spaced intermediate blades disposed between said forward and rear blades and extending between said vertical plates with the lower edge portions thereof sloping downwardly from the ends of the crossties, one of said intermediate blades being adjacent the forward blade and having its outer end disposed forwardly of its inner end and its upper edge portion disposed rearwardly of its lower edge portion, the other of said intermediate blades being adjacent the rear blade and having its outer end disposed rearwardly of its inner end and its upper edge portion disposed forwardly of its lower edge portion, means to move said wing assembly inwardly and outwardly of the vehicle, and means to raise and lower said wing assembly relative to the crossties and the vehicle.

10. In apparatus for operating upon ballast adjacent the ends of crossties of a railroad track in both forward and reverse directions of travel, a railroad vehicle, a wing assembly pivotally mounted on a side of the vehicle and comprising a pair of spaced vertical plates extending substantially parallel to the rails of the railroad track, one of said plates being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, a forward ballast blade mounted between said vertical plates and engaging ballast in the reverse direction of travel of the apparatus and being removed from ballast engaging relation in the forward direction of travel of the apparatus, said forward blade having its outer end disposed rearwardly of its inner end and its upper edge portion disposed forwardly of its lower edge portion, said lower edge portion sloping downwardly from the ends of the crossties, a rear ballast blade mounted between said vertical plates and engaging ballast in the forward direction of travel of the apparatus and being removed from ballast engaging relation in the reverse direction of travel of the apparatus, said rear blade having its outer end disposed rearwardly of its lower edge portion, said rear blade lower edge portion sloping downwardly from the ends of the crossties, a pair of spaced intermediate blades disposed between said forward and rear blades and extending between said vertical plates with the lower edge portions thereof sloping downwardly from the crosstie ends, one of said intermediate blades being adjacent the forward blade and having its outer end disposed forwardly of its inner end and its upper edge portion disposed rearwardly of its lower edge portion, the other of said intermediate blades being adjacent the rear blade and having its outer end disposed rearwardly of its inner end and its upper edge portion disposed forwardly of its lower edge portion, a flexible member extending between the vehicle and the outer side of said wing assembly for supporting the wing assembly, means for raising and lowering the flexible member thereby pivoting said wing assembly on the vehicle between working and non-working positions, means to move said wing assembly in working position inwardly and outwardly of the vehicle in a horizontal plane, and means to raise and lower said wing assembly in a working position in a substantially vertical plane relative to the crossties and the vehicle.

11. In apparatus for operating upon ballast adjacent the ends of the crossties of a railroad track in both forward and reverse directions of travel, a railroad vehicle, a wing assembly attached to a side of the railroad vehicle and comprising a pair of spaced generally vertical plates extending substantially parallel to the rails of the railroad track, one of said plates being disposed adjacent the ends of the crossties and the other being disposed outwardly of the ends of the crossties, a forward ballast blade mounted between said vertical plates and engaging ballast in the reverse direction of travel of the apparatus and being removed from ballast engaging relation in the for-

ward direction of travel of the apparatus, said forward blade having its lower edge portion sloping downwardly from the ends of the crossties, a rear ballast blade mounted between said vertical plates and engaging ballast in the forward direction of travel of the apparatus and being removed from ballast engaging relation in the reverse direction of travel of the apparatus, said rear blade having its lower edge portion sloping downwardly from the ends of the crossties, and means to move the wing assembly into and out of operable position relative to the ballast.



**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,951,166 | Protzeller | Mar. 13, 1934 |
| 2,583,378 | Kershaw | Jan. 22, 1952 |
| 2,748,508 | Schiari | June 5, 1956 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 520,787 | Germany | Mar. 14, 1931 |
| 712,709 | France | July 27, 1931 |