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BALLAST FLOW AND DISTRIBUTOR

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3 Sheets-Sheet 1

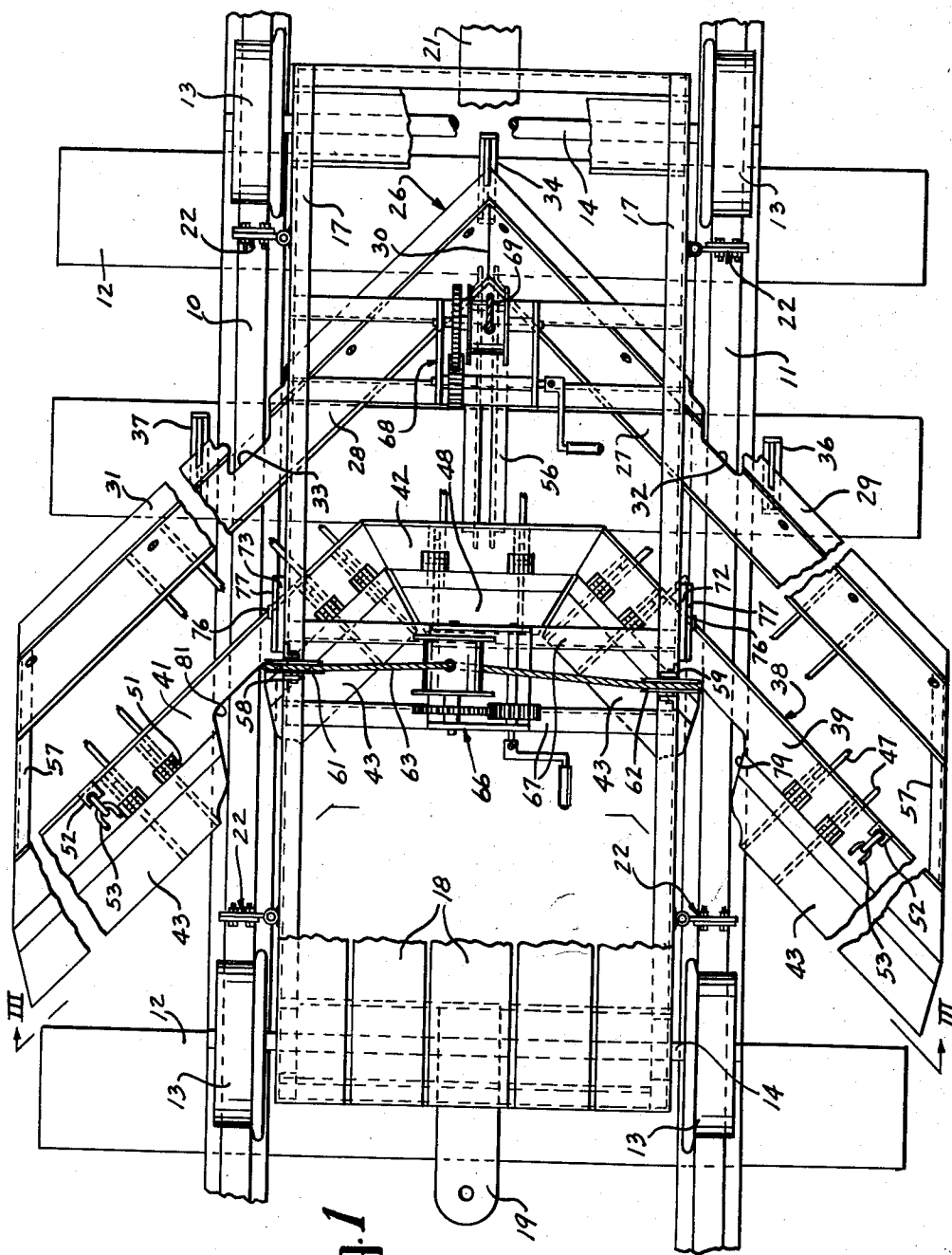


Fig. 1

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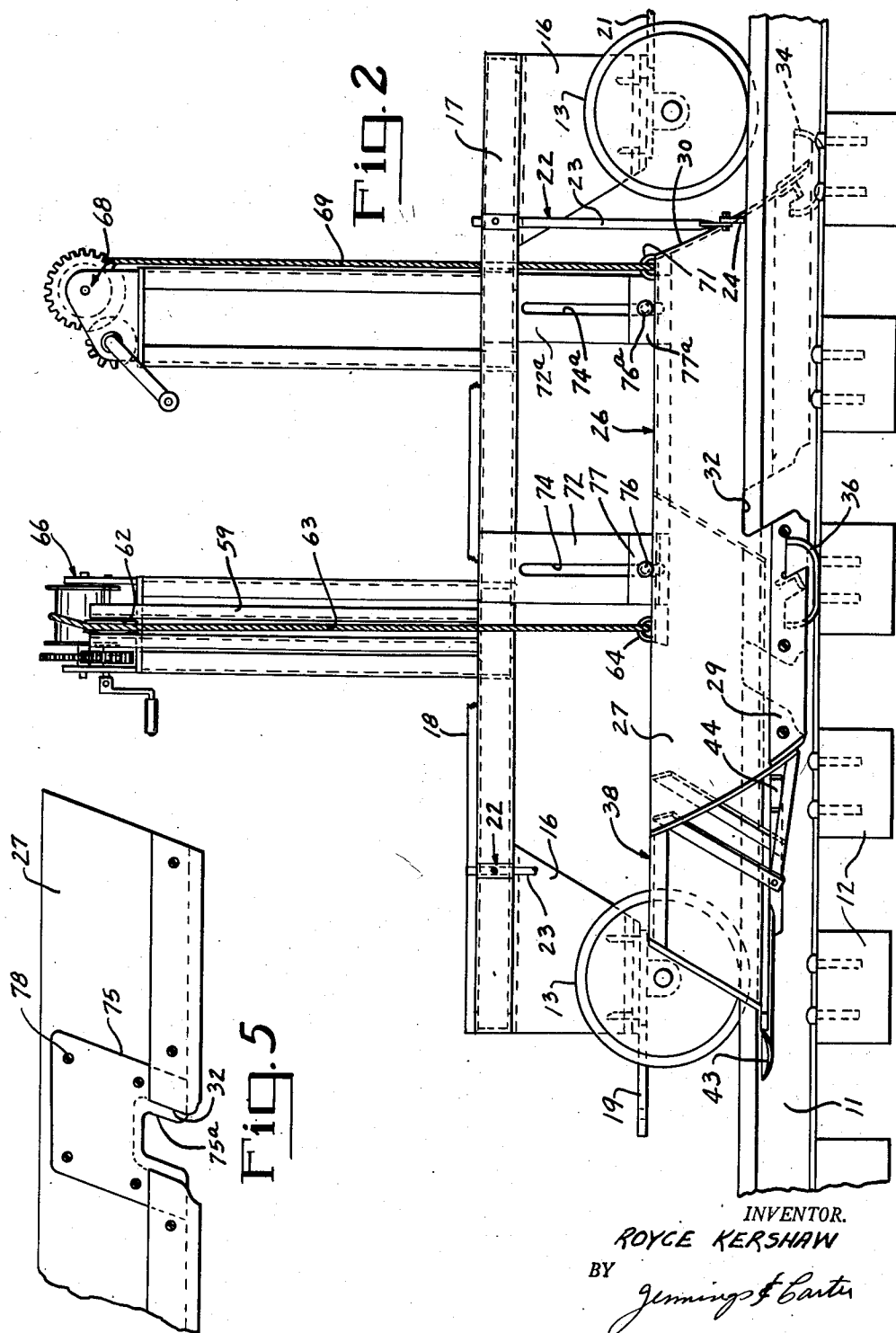
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3 Sheets-Sheet 2



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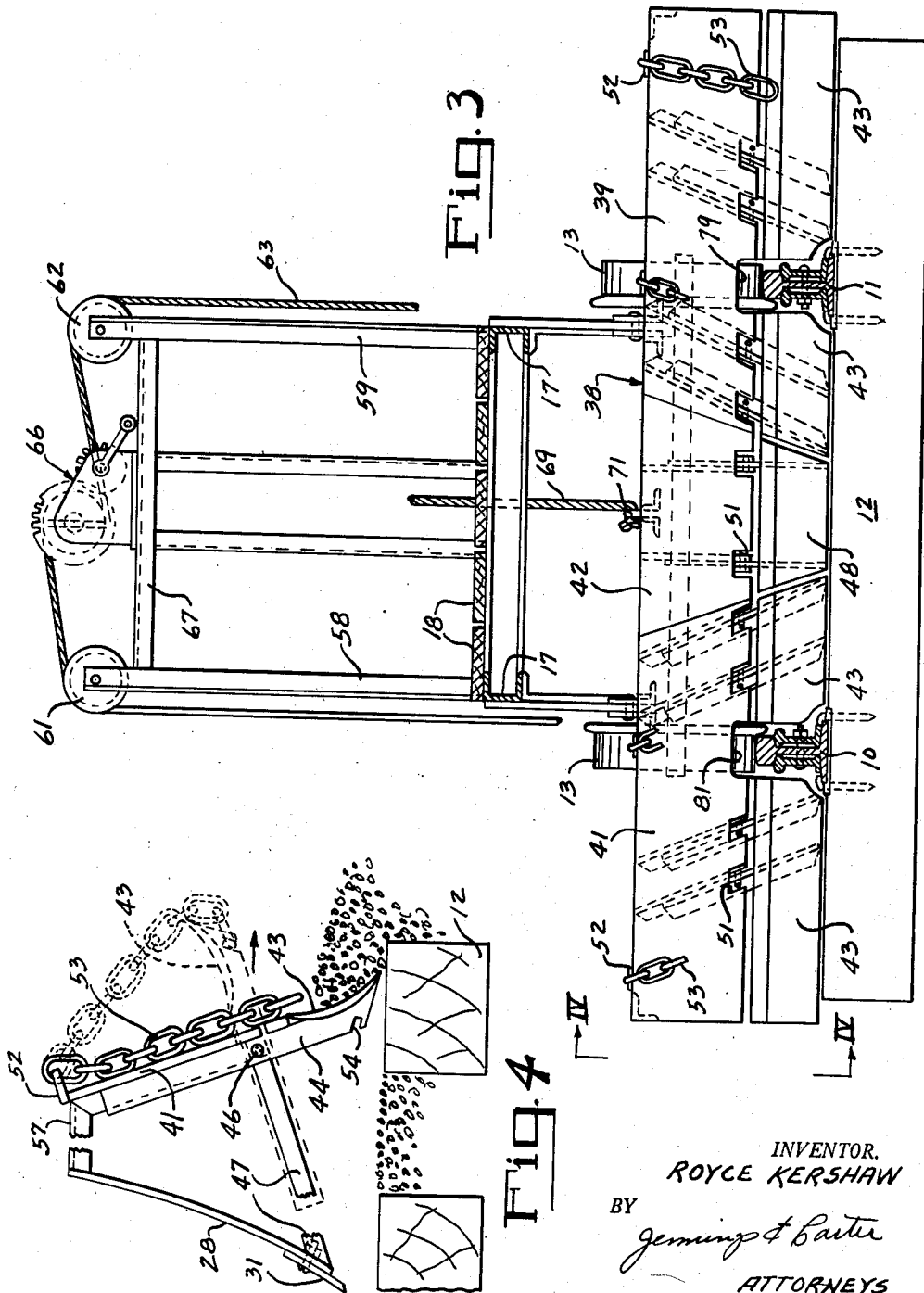
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BALLAST PLOW AND DISTRIBUTOR

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3 Claims. (Cl. 37—104)

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My invention relates to apparatus for regulating and distributing ballast between and around the cross ties of a railroad track and has for an object the provision of such apparatus which shall be effective to evenly regulate and distribute ballast over the road bed, filling all of the cribs between the ties for the full length of the ties whether the ballast is dumped between the rails or adjacent the ends of the ties.

More specifically, my invention contemplates a pair of plow-like spreaders, one of which, hereinafter referred to as the forward plow, is V-shaped and the other of which, hereinafter referred to as the rear plow, is in the form of a truncated V, the plows being mounted rigidly together and for vertical movement on a suitable supporting vehicle, whereby upon forward movement the forward plow is operable to distribute and move the ballast outwardly to the ballast shoulder and upon rearward movement the rearmost plow regulates and pulls ballast toward the center of the track but without feeding an excessive amount of ballast to the center of the track as will be explained later.

Another object is to provide a double plow ballast spreader in which the rear plow is provided with hinged ballast blades, and to fix the two plows in such manner that when the forward one is operating upon the ballast the rear one is inoperative, and which may nevertheless be mounted rigidly together and supported adjustably from the road bed by means of common lifting and holding mechanism.

A further object is to provide a double acting ballast plow and distributor in which the lower working edges of the wings of the forwardmost plow shall be located above the corresponding lower edges of the hinged blades on the rearmost plow when such hinged blades are in working position, whereby when the rear plow is operating on the ballast the forward plow is out of contact therewith, providing a more even and effective spreading action and preventing each of the plows from interfering with the operation of the other.

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

Fig. 1 is a plan view, partly broken away and illustrating a ballast plow and spreader embodying the features of my invention;

Fig. 2 is a side elevational view showing the forwardmost plow in operative position and with the hinged blades of the rearmost plow raised to non-working position;

Fig. 3 is a sectional view taken generally along line III—III of Fig. 1, looking at the working face

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of the rearmost plow and showing the hinged blade sections thereof in working position;

Fig. 4 is a fragmentary detail view taken generally along line IV—IV of Fig. 3 and showing the relative disposition of the forward and rear plows with the hinged blades of the rear plow in working position; and

Fig. 5 is a detail sectional view illustrating a fragment of one of the wings of the forwardmost plow and showing a template which may be placed over the rail opening in the plow wings, accommodating the apparatus to rails of different size.

Referring now to the drawings for a better understanding of my invention my improved apparatus comprises a vehicle adapted to run upon the rails 10 and 11, the rails being supported on the usual cross ties 12. The vehicle comprises flanged wheels 13 suitably mounted on axles 14 in turn journaled on depending axle supporting members 16 forming a part of the undercarriage of the vehicle. The vehicle may be provided with a deck in the form of longitudinally extending members 17 and the same may be decked over with boards or the like 18 for at least a part of the length of the vehicle, providing a platform for the operator. The vehicle may also be provided with tow bar connections 19 and 21, one at each end, the tow bar connection 19 being herein designated the rear tow bar connection and the tow bar connection 21 being designated the forward tow bar connection. Additionally, there may be provided rail sweepers indicated generally by the numeral 22 positioned as shown in the drawings. These sweepers may comprise a rod 23 carrying at its lower end a strip of flexible material 24 which actually engages the rails 10 and 11, thus to remove any ballast from the ball thereof which may be placed thereon while the apparatus is in operation.

Mounted beneath the frame to operate closely to the upper surface of the cross ties 12 is a V-shaped plow indicated generally by the numeral 26. The plow 26, referred to as the forward plow, may comprise a pair of wings formed of plates 27 and 28, joined together at the apex 30 by welding or otherwise and extending past the ends of the cross ties. The plates 27 and 28 are inclined rearwardly as shown in the drawings and may be slightly concave on their forward or working surface. Secured to the lower edges of the plates 27 and 28 are replaceable scraper blades 29 and 31, respectively, which project slightly below the lower edge of their respective plates, thus to engage the ballast. The plates 27 and 28 together with their respective scraper blades 29 and 31 may be notched out as indicated at 32 and 33, re-

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spectively, to provide clearance for the rails and to clear the usual fish plates at the joints of the rails and the cross bolts passing through the fish plates and the rails.

At the apex 30 of the forward plow I provide a skid 34 which is in the form of a double upturned shoe-like member and which is adapted to slide upon the cross ties, thus to guide the front or apex of the plow 26 over the ties, preventing it from digging in or jamming against the cross ties. Similar skids 36 and 37 may be provided intermediate the ends of the wings of the forward plow, preferably just outside of the rails 10 and 11. The forward V-shaped plow thus is skid mounted on the skids 34, 36 and 37 and is capable of operating very closely to the upper surfaces of the ties.

The rear plow indicated generally by the numeral 38 comprises wings in the form of plates 39 and 41 which are inclined opposite to the inclination of the plates 27 and 28 and extend past the ends of the cross ties. As shown in the drawings these wings are substantially parallel to the corresponding wings of the forward plow and are disposed at an angle to draw ballast toward the center of the railroad track when the vehicle moves rearwardly. The rear plow 38 is provided at its center with a plate section 42 which is substantially parallel to the cross ties, that is, normal to the center line of the railroad track. The plates 39 and 41 are joined to the plate 42 by welding or otherwise. The rear plow 38 may thus be defined as being of a truncated V-shape, and the advantages of this arrangement will be described in connection with the operation of the apparatus.

Hinged to the plates 39 and 41 are ballast operating blades 43. As best shown in Fig. 4 these blade sections 43 are welded to the rear side of bars or the like 44. These bars are pivotally mounted as at 46 to forwardly extending members 47 welded or otherwise joined to the rear side or non-working of the respective front plates 27 and 28 of the front plow and to the non-working side of the plates 39 and 41 as the case may be. It will be seen that the upper ends of the members 44 bear against the inner or non-working sides of the plates 39 and 41, thus limiting pivotal movement of the blades 43 when they engage the ballast. The truncated section or plate 42 of the plow is provided with a hinged blade section 48 similar in all respects to the sections 43. The plates 39, 41 and 42 are notched out as at 51 adjacent the pivot points 46, thereby to provide clearance for the members 44 when the pivoted blade sections are moved to inoperative position as will now be explained. The hinged sections are so disposed that blades pivot to working position by gravity.

Connected to brackets 52 at intervals along the upper edge of the plates 39 and 41 are lengths of chain 53. The members 44 may be provided with a notch 54 adjacent their lower ends, behind the blades carried thereby. When it is desired to move the blades 43 to inoperative position they are pivoted upwardly as indicated in dotted lines, Fig. 4, and the chain is hooked into the notches 54 as illustrated in dotted lines in Fig. 4. The hinged section 48 may be held in inoperative position without connecting a chain thereto. This is accomplished by folding this section upwardly prior to upward movement of one of the immediately adjacent sections 43, whereby the section 48 overlies the section 43 and is supported thereby.

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As before stated, the front and rear plows are secured rigidly together. This is accomplished not only by the members 47 already described but also by the provision of additional members 56 at the center of the plows and other members 57 near the ends of the wings. Suffice it to say that suitable and sufficient brace members are provided so that the two plows are rigidly mounted together. Further, the plows are so fixed relative to each other that the lower edges of the hinged sections 43 and 48 are about 3 inches lower than the lower edges of the fixed blades 29 and 31 of the forward plow when the hinge sections are in operative position. Likewise, when the sections 43 and 48 are pivoted to the dotted line position shown in Fig. 4, the arrangement and relative mounting of the plows is such that the lower or working edge of the blades 29 and 31 is about 3 inches lower than the lowermost edges of the plates 39, 41 and 42.

Upright from the frame of the vehicle are columns 58 and 59 on which are mounted pulleys 61 and 62. A cable 63 passes over the pulleys and the ends thereof are connected as at 64 to the plow assembly. The cable passes through a hand operated winch indicated generally by the numeral 66 mounted on cross members 67. In similar manner, I provide a hand winch 68 and a cable 69 which is connected at 71 to the plow assembly adjacent the apex of the forward plow.

Secured to the frame members 17, just forwardly of the point of attachment of the cable 63 to the plow assembly are depending plates 72 and 73. The plates are slotted as indicated at 74 to slidably receive a pin 76 passing through brackets 77 carried by the plow assembly. In similar manner, there is provided at the longitudinal center of the vehicle a single plate 72a disposed substantially over the apex of the forward plow. The member 72a is provided with a slot 74a to receive a pin 76a carried in a bracket 77a secured to the plow assembly. It will be seen from the description just given that the entire plow assembly is capable of vertical movement relative to the vehicle and track and that the pin and slot arrangements guide the plow assembly in its up and down movements.

In some instances it is desirable to vary the effective size of the slots 32 and 33 in the forward plow. This may be accomplished by the provision of a template 75 having therein a slot 75a of suitable size. This template may be secured to the plates 27 or 28 by means of screws 78, thus decreasing the size of the slot 32 or 33 as the case may be, and preventing ballast from escaping therethrough.

In connection with the slots it will be understood that the plates 39 and 41 are provided with rail clearing slots 79 and 81, quite similar to the slots 32 and 33.

From the foregoing the method of constructing and using my improved apparatus may now be explained and understood. With the plows assembled in tandem as shown it will be apparent that if ballast has been dumped from cars or otherwise near the center of the track, that is between the rails 10 and 11, by moving the vehicle forwardly, that is to the right, as shown in Fig. 1, such ballast will be operated upon by the forwardmost plow 26, and distributed over the road bed, filling in all empty cribs the full length of the cross ties. While the apparatus is moving in the forward direction the pivoted blade sections 43 and 48 of the rearmost plow are held in inoperative position by engaging the chains 53 in

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the manner illustrated in Fig. 4. The skids 34, 36 and 37 support the forward end of the entire plow construction, permitting the operating edges of the blades 29 and 31 to operate very closely to the tops of the ties. The plow is full floating in this operation and regulates itself to the horizontal plane of the upper surfaces of the ties. This has the effect of accurately and evenly distributing the ballast between the cribs of the ties and leaves a minimum amount of ballast on top of the ties. Likewise, due to the triangular shape of the forward plow 26, it will be apparent that ballast is moved outwardly of the center line of the track. The inclined blades of the plows exert a lifting and rolling effect on the ballast.

When it is desired to move ballast toward the center of the track the entire plow mechanism is raised upwardly through the medium of the winches and cables and the pivoted blades 43 and 48 of the rearmost plow 38 are released, causing the members 44 to engage behind the plates 41, 39 or 42, thus holding the pivoted blade sections in operative position. In this position of the plows the cables support the lower edges of the pivoted blades just above the level of the cross ties. Likewise, in this position the lower edges of the scraper blades 29 and 31 are raised considerably above the level of the ties as illustrated in Fig. 4, thus to be clear of the ballast, and do not interfere with the regulating and distributing operation of the rear plow.

With either of the plows in operation it will be seen that if the blades or any portion thereof strike an obstruction the entire plow mechanism may ride upwardly due to the slots 74 and 74a and sliding pin connections 76 and 76a. In practice, my improved apparatus has been found to be extremely satisfactory for its intended purposes. The truncated rear plow prevents windrowing of the ballast at the center of the track when the apparatus is moved rearwardly. The straight or normally disposed section 48 gives a very even distribution of ballast adjacent the center of the railroad track and eliminates a considerable amount of hand labor over that necessary when using a V-shaped plow for pulling ballast toward the center of the track. In either forward or reverse direction it has been found that my improved apparatus completely fills the spaces between the ties and effects substantially a finished job with respect to ballasting, very little hand labor being required to complete the ballasting of the track.

With respect to Fig. 5, the provision of the removable templates for reducing the fixed size of the openings 32 and 33 provides means for accommodating the apparatus to rails of smaller sizes without permitting ballast to spill through the fixed openings 32 and 33.

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 other 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 railroad ballast working apparatus the

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combination with a vehicle adapted to travel along the rails of the track, of a truncated V-shaped plow-like ballast distributor having a pair of plate-like plow wing sections extending outwardly substantially to the ends of the cross ties and forming acute angles with the longitudinal center line of the railroad track, a medial plate-like section between the rails of the track and disposed substantially normal to the longitudinal center line of the track to which the inner ends of the wings are connected, at least one ballast engaging blade pivotally connected adjacent the lower edge of each of the plate-like sections, means mounting the distributor on the vehicle, and stop means on the apparatus limiting pivotal movement of the blades in response to movement of the vehicle in a direction to engage the working sides of the blades with the ballast.

2. In a railroad ballast working apparatus the combination with a vehicle adapted to travel along the rails of the track, of a truncated V-shaped plow-like ballast distributor having side plates extending outwardly substantially to the ends of the cross ties, a medial plate at the truncated apex of the distributor disposed at right angles to the longitudinal center line of the track, means mounting the distributor on the vehicle, pivoted ballast engaging blades on the side plates of the distributor disposed on either side of the rails, a similar pivoted blade on the medial plate, stop means on the apparatus limiting pivotal movement of the blades in response to engagement of the ballast with the working sides of the blades, and detachable connectors between the side plates and the pivoted blades carried thereby for holding the pivoted blades out of working position.

3. Apparatus as defined in claim 2 in which the stop means for the pivoted blades comprise arms carried by each blade and engageable against the side of the side plates opposite the working surface thereof.

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