

Jan. 20, 1959

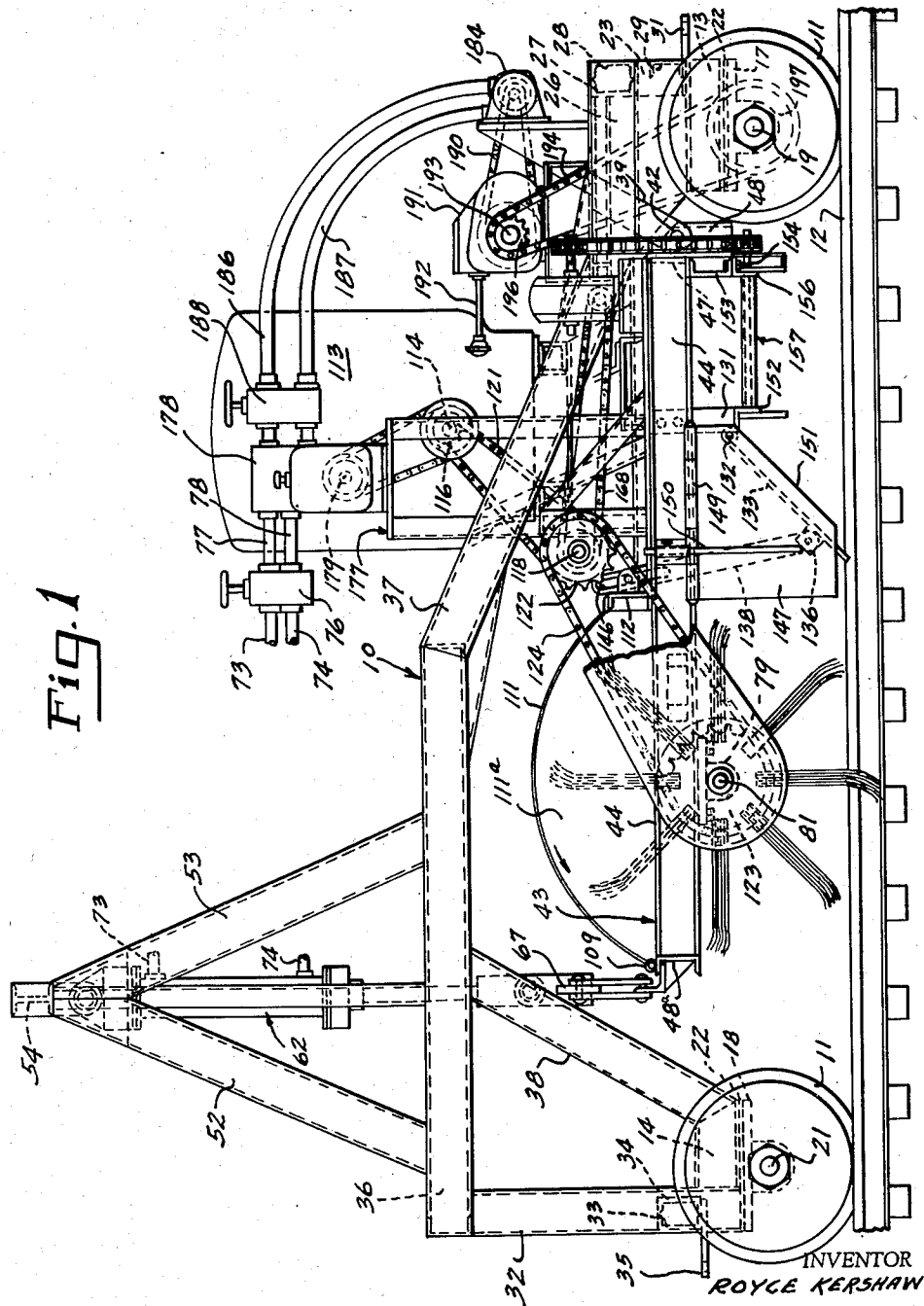
R. KERSHAW

2,869,159

RAILROAD TRACK SWEEPER

Filed Feb. 9, 1955

5 Sheets-Sheet 1



BY *Jennings & Carter*

ATTORNEYS

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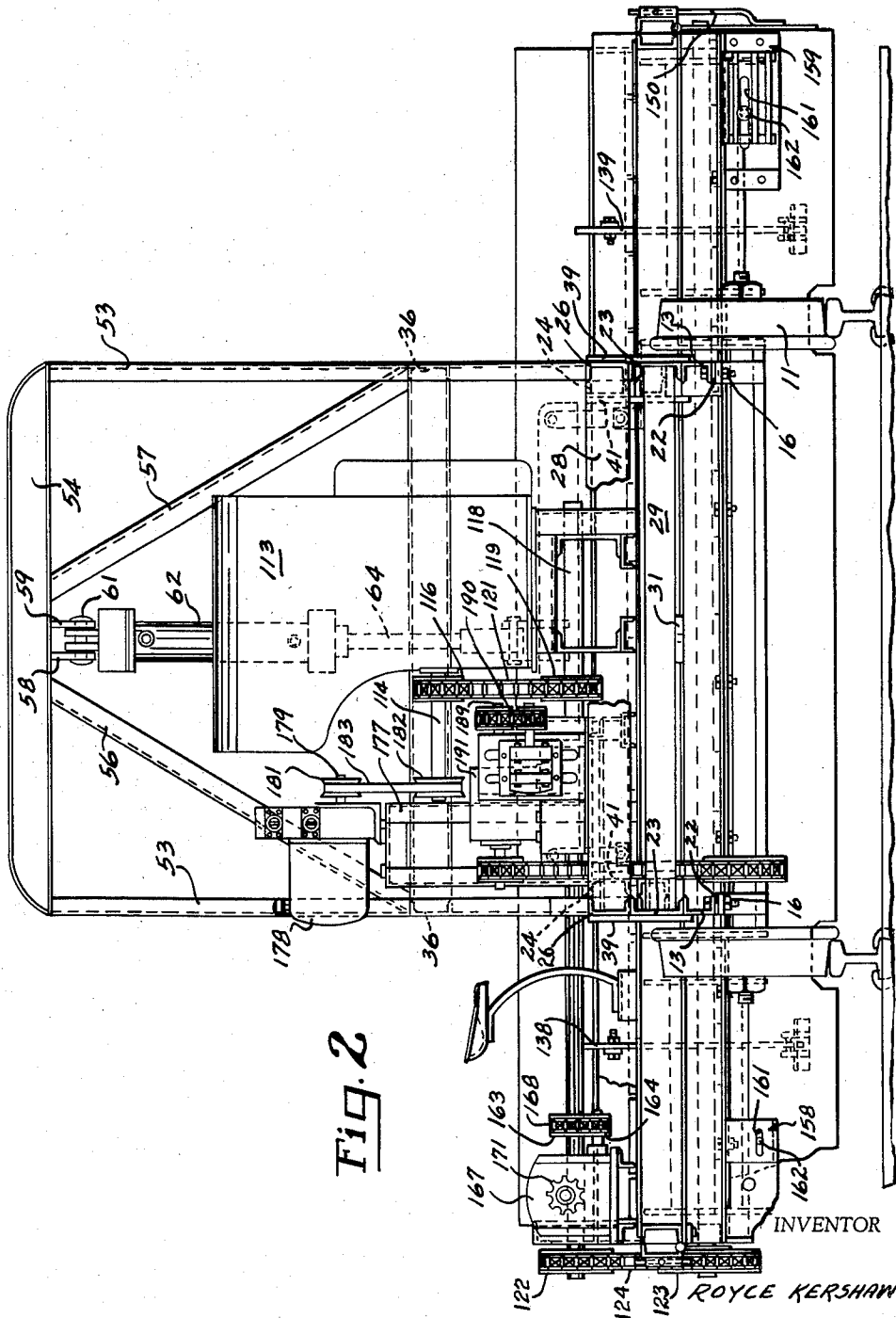


Fig. 2

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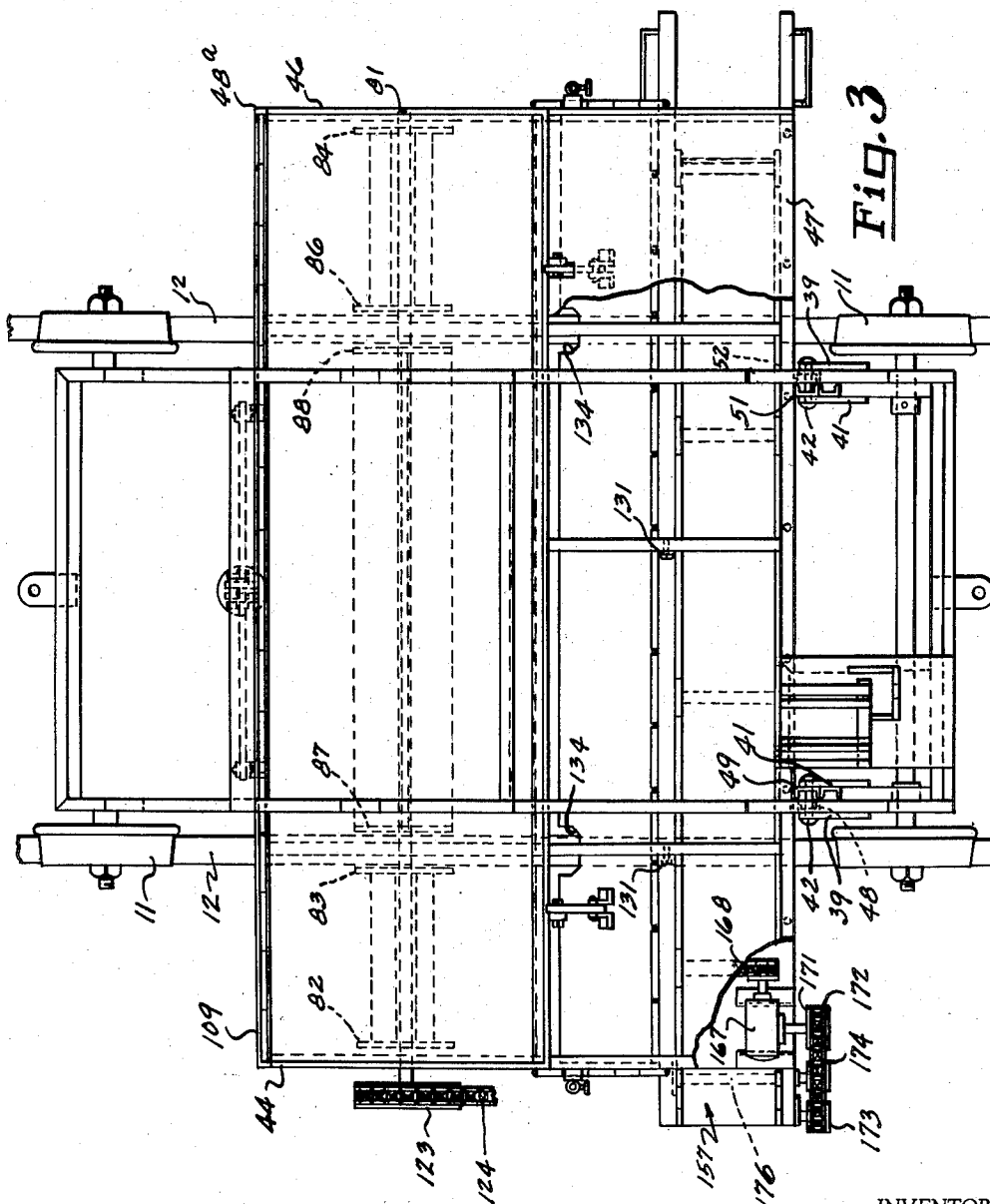


Fig. 3

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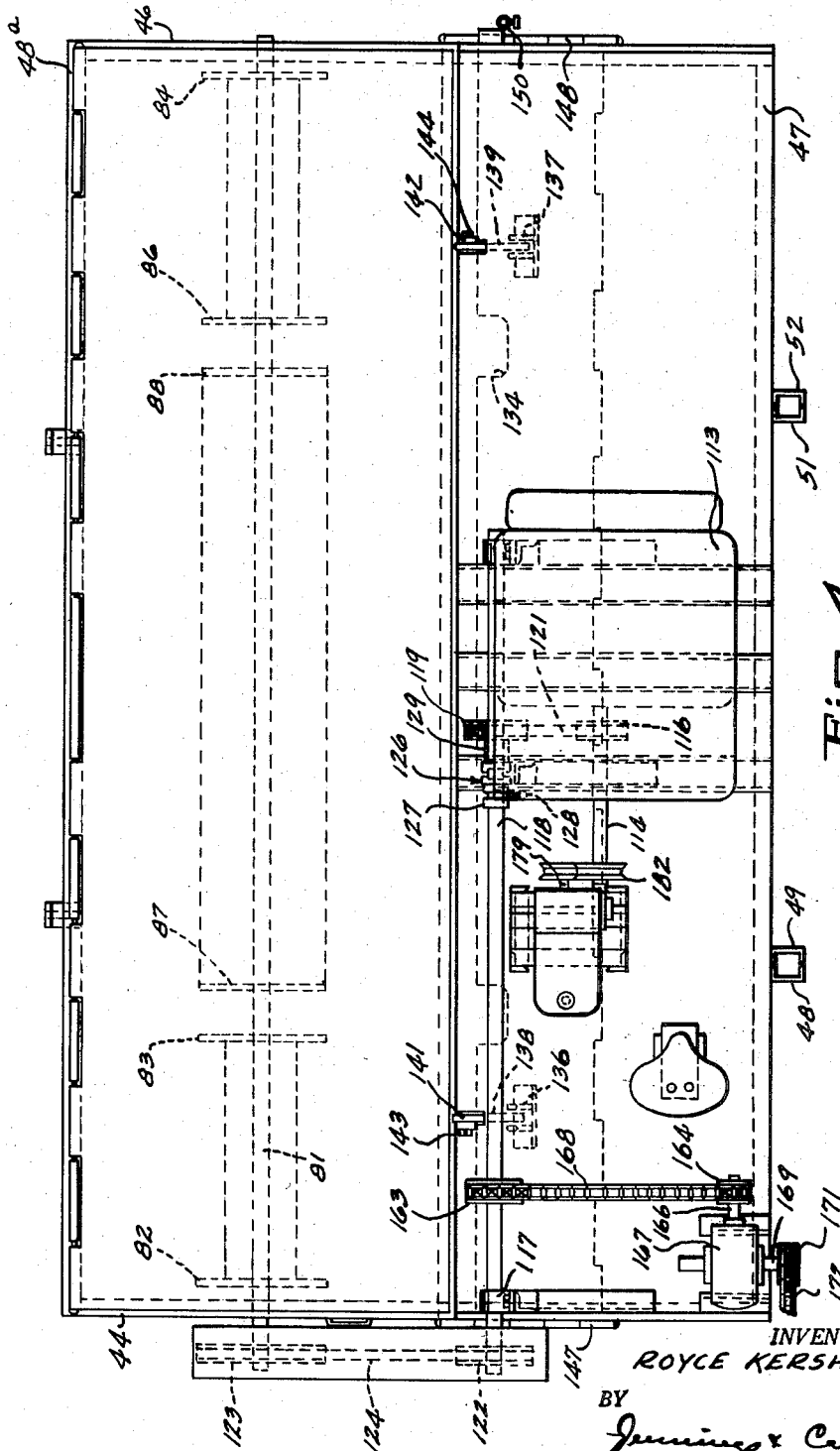
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2,869,159

RAILROAD TRACK SWEEPER

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Application February 9, 1955, Serial No. 487,091

5 Claims. (Cl. 15—55)

This invention relates to a railroad track sweeper and has for an object the provision of effective means for removing ballast car drippings and the like from between and alongside the rails and placing the same upon the shoulder of the road.

A more specific object of my invention is to provide rotary brush means for removing excess ballast or other loose materials from between the rails and the area alongside and outwardly of the rails in combination with a transverse conveyor which deposits the materials thus removed upon the shoulder of the road without the necessity of intermediate conveyors for lifting and transferring the materials from the rotary brush to the ultimate conveyor which deposits the materials onto the shoulder of the road.

A further object of my invention is to provide apparatus of the character designated in which a single operator may do the work of keeping the track free of car drippings and also remove loose ballast from between and the area adjacent the outer sides of the rails which at the present, by manual means, requires a gang of from 10 to 15 men, and at the same time accomplishes the track cleaning operation with more accuracy and efficiency than with the hand methods heretofore employed.

Briefly, my improved track sweeper comprises a vehicle frame adapted for movement along the rails of a track and a longitudinally extending broom frame mounted for pivotal movement adjacent the forward end of the vehicle frame and extending rearwardly thereof. A transverse rotary broom is mounted adjacent the rear end of the broom frame in position to sweep up loose materials from between and the area alongside the rails and throw the same forwardly over a transverse deflector plate onto a transverse conveyor which deposits the same onto the shoulder of the road. The rear end of the broom frame is adjustable vertically and the rotary broom rotates in a direction whereby the lower surface thereof moves in the direction of travel of the apparatus.

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;

Fig. 2 is a front elevational view, certain parts being omitted for the sake of clarity;

Fig. 3 is a plan view showing the manner in which the broom frame is mounted on the vehicle frame, certain parts being omitted for the sake of clarity;

Fig. 4 is a plan view of the broom frame removed from the vehicle frame;

Fig. 5 is an enlarged detail view showing the means for raising and lowering the rear end of the broom frame; and,

Fig. 6 is a detail view showing the rotary broom removed from the broom frame, partly broken away and in section.

Referring now to the drawings for a better understanding of my invention, I show a vehicle frame 10 supported

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by flanged wheels 11 disposed to run upon the railroad rails 12 of a railroad track. The vehicle frame 10 comprises relatively short longitudinally extending side channels 13 and 14 at the front and rear corners, respectively.

Secured to the undersurface of the side channels 13 and 14 by any suitable means, such as bolts 16, are bearing members 17 and 18, respectively, for receiving front and rear axles 19 and 21, upon which the wheels 11 are mounted. To give added strength to the channels 13 and 14, I provide reinforcing strips 22 between the channels and their respective bearing members 17 and 18, as the case may be.

Secured to the upper surface of the side channels 13 and extending parallel thereto are side channels 23 which face each other, as shown in Fig. 2. Secured to the upper surface of the channels 23 are pairs of channel members 24 and 26 facing each other to form boxed channels which are connected by transverse channels 27 and 28 which face each other to form boxed channels, as shown in Fig. 1. Also, connecting the side channels 23 adjacent the forward end thereof is a transverse channel 29 having a draw bar 31 attached to the same adjacent the center thereof.

Secured to the rear ends of the side channels 14 are vertical channels 32 which are connected adjacent the lower ends thereof by boxed channels 33 and 34, as shown in Fig. 1. Attached to the under surface of the channels 33 and 34 and projecting rearwardly thereof is a draw bar 35. Secured to the upper ends of the vertical channels 32 are forwardly extending horizontal side channels 36 which are connected to the rear ends of the boxed channels 24 and 26 by forwardly and downwardly sloping side channels 37. To add strength to the vehicle frame, diagonal channels 38 connect the forward ends of the side channels 14 to the horizontal channels 36.

Secured rigidly to opposite sides of the boxed channels 24 and 26 and extending downwardly and rearwardly therefrom are support brackets 39 and 41. Pivotaly connected to the support brackets 39 and 41 by means of pins 42 is the forward end of a broom frame indicated generally by the numeral 43. The broom frame comprises side channels 44 and 46 connected by transverse channels 47 and 48a at the front and rear thereof, respectively. Secured to the forward side of the transverse channel 47 are vertically extending boxed channels 48—49 and 51—52 positioned to fit between the support brackets 39 and 41 and are pivotaly connected thereto by means of the pins 42. The upper ends of the vertical box channels 48—49 and 51—52 are cut away, as shown in Fig. 1, whereby they slope downwardly toward the forward end thereof.

Mounted on top of the horizontal channels 36 are oppositely disposed longitudinally spaced channel members 52 and 53 which converge toward the upper ends thereof, as shown. Connecting the upper ends of the channel members 52—53 is a transverse I-beam 54. Connecting the side channels 36 to the I-beam 54 are suitable diagonal braces 56 and 57. Secured to the under surface of the I-beam 54 adjacent the center thereof and projecting downwardly therefrom are spaced support brackets 58 and 59 having suitable openings therethrough for receiving a pivot pin 61. Pivotaly connected to the brackets 58 and 59 by means of the pivot pin 61 is the upper end of a fluid pressure operated cylinder 62 having a piston 63 and a downwardly projecting piston rod 64. Pivotaly connected to the lower end of the piston rod 64 by means of pivot pin 65 and links 66 is an equalizing bar 67. Pivotaly connected to opposite ends of the equalizing bar 67 are downwardly extending links 68 and 69 which are pivotaly connected at their lower ends to angle brackets 71 and 72 respectively. The angle brackets are secured by any suitable

means, such as by welding, to the transverse channel member 48a at the rear end of the broom frame. Fluid under pressure is supplied to the upper and lower ends of the cylinder 62 by conduits 73 and 74, respectively, through a four-way valve 76. Fluid under pressure is supplied to the four-way valve 76 from a suitable source of supply, to be described hereinafter, through a conduit 77 and fluid is returned to the source of supply through a return conduit 78.

Mounted for rotation in suitable bearings 79 carried by the side channels 44 and 46 is a transverse shaft 81. Mounted on the shaft 81 in position to lie outwardly of one of the rails 12 is a pair of spaced disc members 82 and 83. In like manner, mounted on the shaft 81 outwardly of the other rail 12 are spaced disc members 84 and 86. Mounted on the shaft 81 and disposed to lie between the rails 12 are transversely spaced disc members 87 and 88. The disc members are all rigidly secured to the shaft 81 whereby they rotate therewith. Extending between the disc members 82 and 83 are pairs of transverse cross bars 89 which are spaced angularly from each other at approximately 90°. The cross members of the pair 89 are provided with semi-circular recesses in the adjoining sides thereof which form radially extending openings 91 for receiving brush members 92, which are preferably formed of lengths of heavy flexible cable. In like manner, mounted between the disc members 84 and 86 are pairs of cross bars 93 having radially extending openings 94 therein for receiving brush members 96. Mounted between the disc members 87 and 88 are pairs of transverse cross bars 97 which are also spaced angularly at approximately 90° from each other. These cross bars are also provided with semi-circular recesses therein which form openings 98 for receiving radially extending brushes 99. As shown in Fig. 6, the individual cross bars of each pair are secured to each other by means of bolts 101, having retaining nuts 102.

Preferably the cross bars 89 and 93 are staggered angularly on the shaft 81 at approximately 45° relative to the cross bars 97. That is to say, the radial rows of brushes 92 and 96 extend in the same transverse planes whereas the radial rows of brushes 99 extend in transverse planes spaced angularly 45° from the brushes 92 and 96. By so staggering the brushes, the brushes contact the ground at different times thereby providing for smooth operation of the brush as it rotates.

Mounted on the inner surface of the disc member 83 by any suitable means, such as by welding, are radially extending sections of pipe or tubular members 103 which are spaced at an angle of approximately 45° from the cross bars 89. Brush elements 92a are mounted in each of the tubular members 103. In like manner mounted on the inner surface of the disc member 86 are radially extending tubular members 104 having radially extending brushes 96a mounted therein which extend in planes at approximately 45° relative to the brushes 96. Also, mounted on the inner surface of the disc members 87 and 88 are radially extending tubular members 106 and 107, respectively. Mounted in the tubular members 106 and 107 are brushes 99a which extend radially at approximately 45° to a radial line passing through the adjacent rows of brushes 99. The brushes 92a, 96a and 99a are secured in their respective tubular members by any suitable means such as by set screws 108. By mounting the brushes 92a and 99a between the brushes 92 and 99 and mounting the brushes 96a and 99a between the brushes 96 and 99, I provide brushes adjacent each side of the rails which are spaced angularly at 45° from each other, thus assuring that the area adjacent the rails is cleaned thoroughly.

Pivotaly mounted to the upper flange of the transverse channel 48a at the rear end of the broom frame 43 by means of a piano hinge 109 is a forwardly extending curved brush cover member 111 having side walls 111a. The forward end of the cover member 111 is supported

by a transverse channel 112 mounted on the broom frame.

Mounted on the broom frame forwardly of the broom is a power unit 113, which may be in the form of an internal combustion engine. Projecting laterally from the power unit 113 is a drive shaft 114. Mounted on the drive shaft 114 is a sprocket 116. Mounted in suitable bearings 117 on the broom frame 43 and extending transversely thereof is a jack shaft 118. Mounted on the jack shaft 118 opposite the sprocket 116 is a sprocket 119 and connecting the sprockets 116 and 119 is a sprocket chain 121. Mounted adjacent the end of the jack shaft 118 is a sprocket 122 which drives a sprocket 123 on the shaft 81 through the medium of a sprocket chain 124. The rotary brush in thus rotated, by the power unit 113 through the sprocket chains 121 and 124 and their associate sprockets, in a direction for the lower surface thereof to move in the direction of travel of the apparatus on the rails 12.

In order to disconnect the rotary brush from the power unit 113, I provide a jaw type clutch 126 which comprises a slidable element 127 which is splined to the jack shaft 118 and movable axially thereof by means on an operating lever 128. The sprocket 119 is provided with an elongated sleeve portion 129 and is mounted for free rotation on the jack shaft 118. Suitable jaw elements are provided at the inner ends of the sliding element 127 and the sleeve portion 129 whereby the sprocket 119 is connected in driving relation with the shaft 118 when the jaw of the clutch element 127 is moved into contact with the jaw of the clutch element on the sleeve portion 129.

Secured to the broom frame and projecting downwardly therefrom are transversely spaced support bars 131. Mounted adjacent the lower end of the support bars 131 by means of a piano hinge 132 is a deflector plate 133 which extends transversely of the broom frame. The lower edge of the deflector plate is provided with cut-out portions 134 for receiving the rails 12 of the track. Mounted adjacent the lower edge of the deflector plate 133 are laterally spaced brackets 136 and 137 to which are pivotally mounted the lower ends of adjusting levers 138 and 139, respectively. Brackets 141 and 142 are mounted on the transverse channel 112 above the brackets 136 and 137 and are provided with suitable openings for receiving bolts 143 and 144, respectively. The upper ends of the adjusting levers are provided with elongated slots 146 for receiving the bolts 143 and 144, whereby the lower edge of the deflector plate 133 may be raised and lowered and locked in selected positions.

Pivotaly mounted to the side channels 44 and 46 of the broom frame are downwardly extending side cover plates 147 and 148. Preferably, the side plates 147 and 148 are connected to the side channels by means of a piano hinge 149. The side plates 147 and 148 are cut away at their lower forward corners as at 151 to provide a sloping forward edge. To limit lateral movement of the side plates 147 and 148 vertically extending arms 150 are mounted adjacent the outer surface thereof. The side plates serve to hold the loose material onto the deflector plate 133 as it is brushed up and over the same by the rotary brush.

Secured to the lower ends of the support bars 131 is a transverse angle 152. Mounted on the undersurface of the broom frame adjacent the forward end thereof by any suitable means, such as by welding, is a transverse channel 153 and secured to the bottom of the channel 153 by means of bolts 154 is a transverse angle 156. Supported between the transverse angles 152 and 156 is a transverse conveyor indicated generally at 157. As shown in Fig. 2, the belt for the transverse conveyor 157 is tightened by suitable belt tighteners 158 and 159 at opposite ends thereof. The belt tightener is preferably of the type having inner plates secured to opposite ends of the conveyor and outer plates positioned in sliding

contact therewith. Elongated slots 161 are provided in the plates for receiving adjusting bolts 162 whereby the plates may be locked in selected positions relative to each other.

Mounted on the jack shaft 118 between the sprocket 122 and the clutch 126 is a sprocket 163 which drives a sprocket 164 mounted on the input shaft 166 of a gear box 167 through a sprocket chain 168. The output shaft 169 of the gear box 167 has a sprocket 171 mounted thereon which drives a sprocket chain 172. The sprocket chain 172 passes around suitable idler sprockets 173 and thence over a drive sprocket 174 mounted on a shaft 176 which drives the transverse conveyor 157.

Mounted on the broom frame 43 alongside the power unit 113 is an upstanding frame indicated generally at 177 which supports a fluid pressure pump 178 having a driven shaft 179 with a pulley 181 mounted thereon. Mounted on the drive shaft 114 of the power unit 113 is a pulley 182 which is connected to the pulley 181 by means of a V-belt 183. As shown in Fig. 1, the fluid pressure pump 178 is connected to the supply and return lines 77 and 78, respectively, of the four-way valve 76. The fluid pressure pump 178 is connected to a reversible fluid pressure operated motor 184 by means of conduits 186 and 187. A suitable valve 188 is connected to the conduits 186 and 187 whereby the direction of travel of the fluid through the reversible motor 184 may be reversed.

The reversible fluid motor 184 drives, through the medium of a sprocket chain 190 and suitable sprockets, the input shaft 189 of a transmission unit, such as a variable speed, sliding gear type indicated generally by the numeral 191. Extending rearwardly from the transmission unit 191 is a gear shift lever 192. The output shaft 193 of the transmission drives the axle 19 through a sprocket chain 194 and sprocket wheels 196 and 197 mounted on the shaft 193 and the axle 19, respectively. As shown in Fig. 1, the reversible fluid motor 184 and the transmission unit 191 are both mounted on the vehicle frame and the fluid motor 184 is connected to the fluid pressure pump 178 by flexible conduits.

From the foregoing description, the operation of my improved apparatus will be readily understood. As the apparatus moves along the rails 12, the broom frame 43 is lowered to the proper elevation by actuating the four-way valve 76 which causes the cylinder 62 to raise or lower the rear end of the broom frame to the proper elevation. The rotary broom is rotated by the power unit 113, in the direction of the arrow indicated in Fig. 1, through the medium of the sprocket chains 121 and 124 and their associated sprockets, thus causing the loose material between the rails and in the area adjacent the outer sides of the rails to be brushed up and over the deflector plate 133 onto the transverse conveyor 157. The deflector plate 133 is hinged at its upper end whereby the lower end thereof rides on the loose material to be swept up. Also, the lower end of the deflector plate is raised and lowered and locked at the proper elevation by means of the adjusting bolts 143 and 144 which pass through the elongated slots 146 in the upper end of the adjusting levers 138 and 139. The loose material thus deposited on the transverse conveyor 157 by the rotary brush and deflector plate 133 is discharged by the conveyor onto the shoulder of the road.

From the foregoing it will be seen that I have devised an improved railroad track sweeper which is effective to sweep up all loose material between the rails and alongside the same and transfer the same directly onto a transverse conveyor which deposits the same onto the shoulder of the track. It will also be seen that my improved apparatus is simple of construction and operation and cleans the track with more accuracy and efficiency than hand methods heretofore employed.

In actual practice I have found that my improved apparatus is fully effective for its intended purposes and

replaces a large number of men in the track cleaning operation.

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 a railroad track sweeper, a vehicle frame adapted for movement along the rails of a track and having an upwardly and rearwardly extending portion, a longitudinally extending broom frame mounted for pivotal movement relative to and adjacent the forward end of the vehicle frame and extending rearwardly thereof beneath said upwardly and rearwardly extending portion, power means pivotally connecting said broom frame to said upwardly and rearwardly extending portion for raising and lowering the rear end of said broom frame, a transverse rotary broom mounted adjacent the rear end of said broom frame, said broom frame and said rotary broom extending laterally and outwardly of said vehicle frame and said broom being in position to sweep up loose materials between and alongside the rails and throw the same forward, a transverse conveyor mounted on the broom frame forwardly of said broom, a transverse plate pivotally mounted at its upper end to the broom frame between said conveyor and the broom in position to deflect the material swept up by the broom onto the conveyor, said transverse plate extending beyond the lateral edges of the rails and having cut out portions adjacent its lower edge for receiving said rails, and means to adjust the elevation of the lower edge of said transverse plate.

2. In a railroad track sweeper as defined in claim 1 and further characterized in that a side cover plate having a sloping forward edge portion is arranged adjacent each end of the transverse plate for holding the material on said transverse plate.

3. A railroad track sweeper comprising a longitudinally extending vehicle frame embodying relatively short front and rear end sections, an upwardly inclined and rearwardly extending section connected at its forward end to the front end section, a horizontal section connected at its forward end to the rear end of said upwardly inclined and rearwardly extending section, a vertically extending section connecting the rear end of said horizontal section to said rear section, a broom frame mounted for vertical adjustment relative to the vehicle frame and extending from adjacent the forward end of said vehicle frame rearwardly beneath said upwardly inclined and rearwardly extending section and said horizontal section, a transverse rotary broom adjacent the rear end of said broom frame, said broom frame and said broom extending laterally and outwardly of said vehicle frame and said broom being in position to sweep up loose materials between and alongside the rails and throw the same forwardly, a transverse shaft mounted for rotation adjacent the rear end of said broom frame for supporting said broom, a pair of transversely spaced disc members mounted adjacent each end of the shaft with the inner disc member of each pair disposed to rotate adjacent the outer side of a rail, other disc members mounted on said shaft and disposed to lie adjacent the inner sides of the rails, radially extending brushes mounted transversely in rows between the disc members of said pairs and said other disc members, power means mounted on the vehicle frame and connected to the broom frame for raising and lowering said broom frame, and a transverse conveyor mounted on said broom frame forwardly of said broom in position to receive the material swept up by the broom and deposit the same onto the track shoulders.

4. In a railroad track sweeper, a vehicle frame adapted

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for movement along the rails of a track, a broom frame mounted for pivotal movement on the forward end of said vehicle frame and extending rearwardly therefrom, power means on said vehicle frame for raising and lowering the rear end of said broom frame, a transverse rotary broom mounted adjacent the rear end of said broom frame, said broom frame and said broom extending laterally and outwardly of said vehicle frame and said broom being in position to sweep up loose materials between and alongside the rails and throw the same forward, a transverse conveyor mounted on the broom frame forwardly of said broom, a transverse plate pivotally mounted at its upper end to the broom frame between said conveyor and the broom in position to deflect the material swept up by the broom onto the conveyor, said transverse plate extending beyond the lateral edges of the rails and having cut out portions adjacent its lower edge for receiving said rails, and means to adjust the elevation of the lower edge of said transverse plate.

5. In a railroad track sweeper, a vehicle frame adapted for movement along the rails of a track, a broom frame mounted for pivotal movement on the forward end of said vehicle frame and extending rearwardly therefrom, a transverse rotary broom adjacent the rear end of said broom frame, said broom frame and broom extending laterally and outwardly of said vehicle frame and said broom being in position to sweep up loose materials between and alongside the rails and throw the same forwardly, a transverse shaft mounted for rotation adjacent

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the rear end of said broom frame for supporting said rotary broom; a pair of transversely spaced disc members mounted adjacent each end of the shaft with the inner disc member of each pair disposed to rotate adjacent the outer side of a rail, other disc members mounted on said shaft and disposed to lie adjacent the inner sides of the rails, radially extending brushes mounted transversely in rows and between the disc members of said pairs and between said other disc members; power means mounted on the vehicle frame and pivotally connected to the broom frame for raising and lowering the rear end of said broom frame, and a transverse conveyor mounted on said broom frame forwardly of said broom in position to receive the material swept up by the broom and deposit the same onto the track shoulders.

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