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BALLAST STRIPPER

Filed March 29, 1946 2 Sheets-Sheet 1

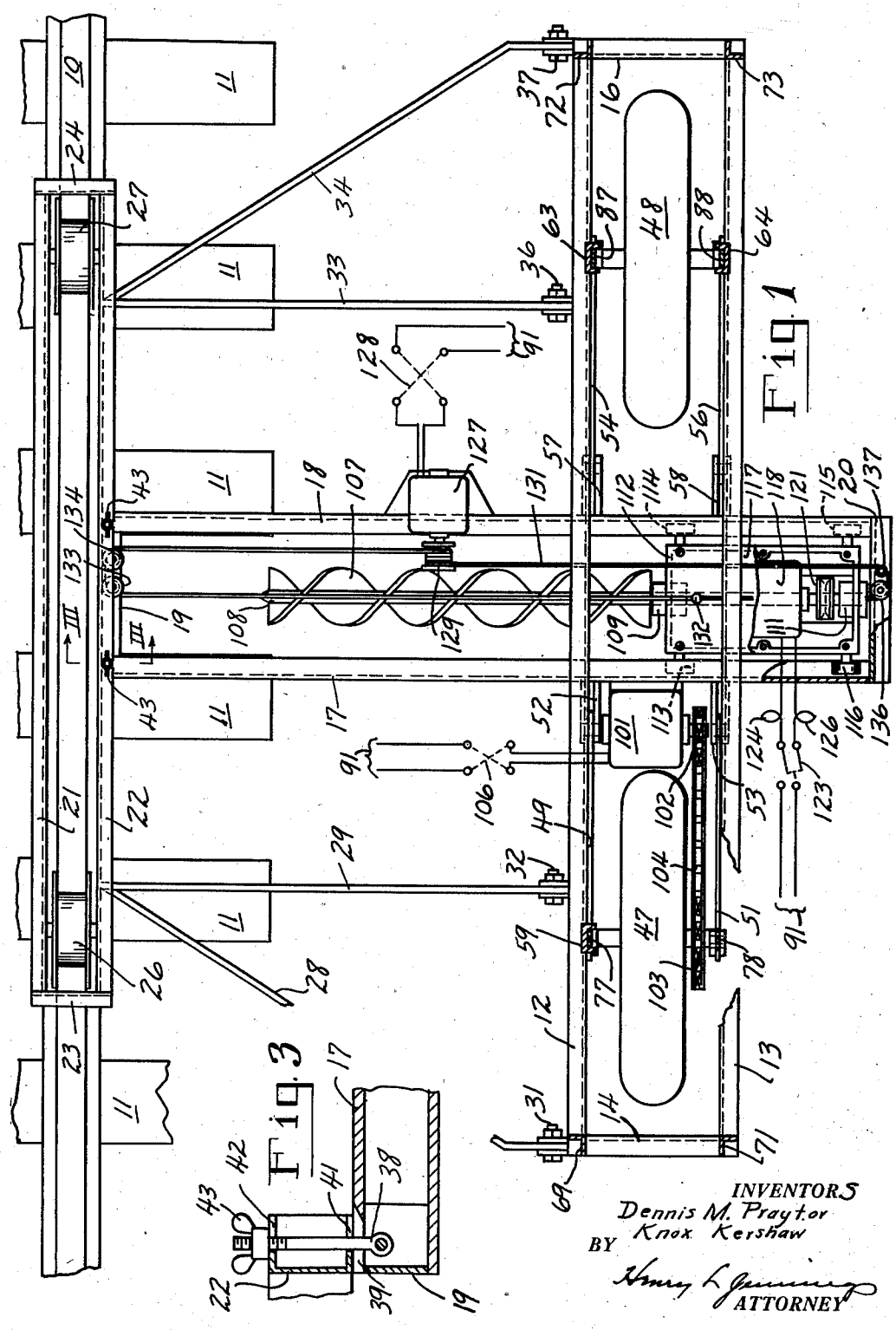


Fig. 1

Fig. 3

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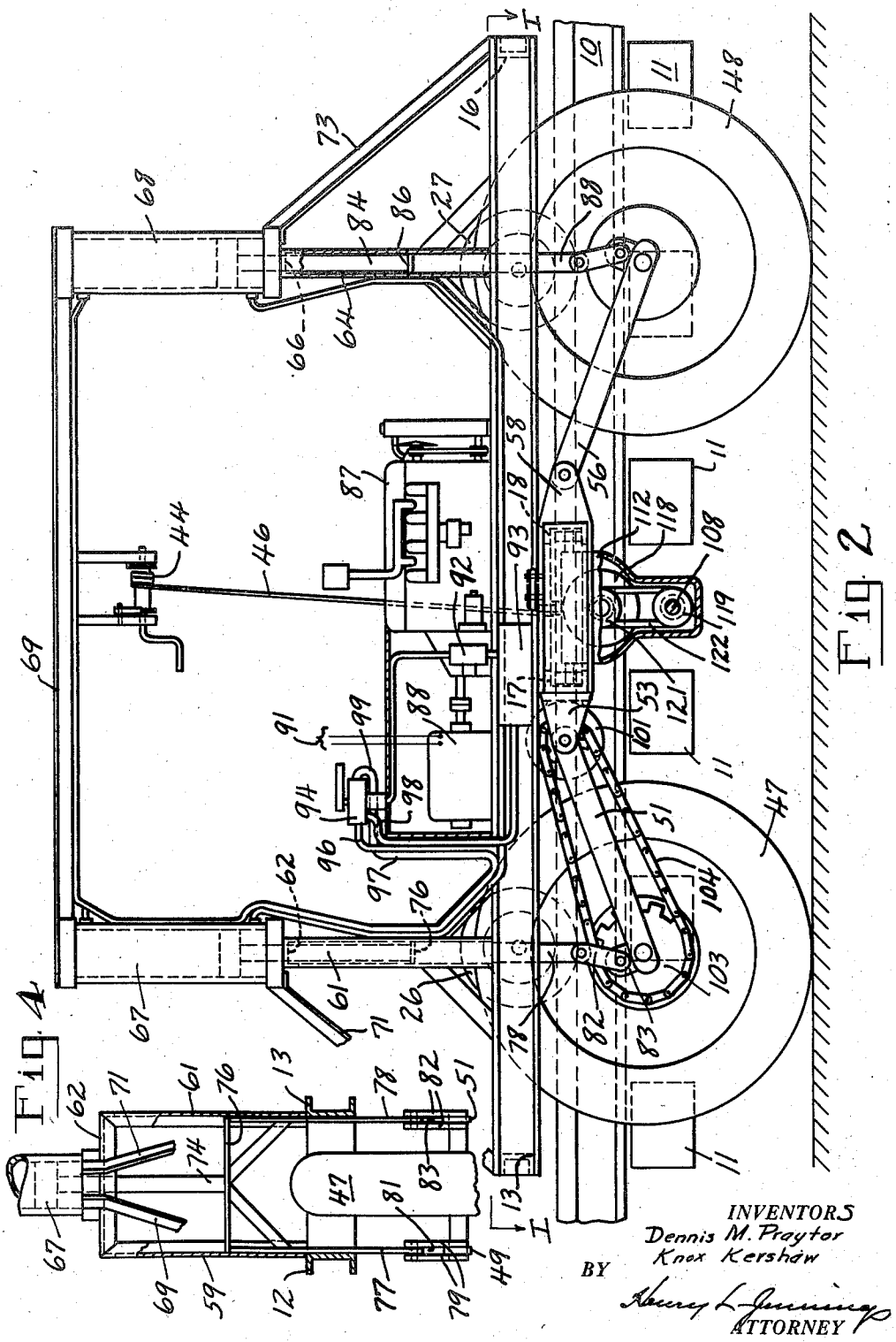


FIG. 2

FIG. 4

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BALLAST STRIPPER

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7 Claims. (Cl. 37—104)

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This invention relates to a machine for stripping the ballast from between the cross ties of a railroad track and has for one of its objects the provision of apparatus of the character designated which shall be operable at one side of the track and which may be quickly removed out of the way of passing trains.

A further object of our invention is to provide a ballast stripping machine embodying motor driven supporting wheels adapted to run alongside the track and which shall include means to adjust the mechanism of the apparatus to various levels of road bed.

A further object of our invention is to provide a ballast stripping machine embodying a reciprocable motor driven augur and a housing for the motor and the augur which shall be adapted to enter the space between adjacent cross ties.

A still further object of our invention is to provide a ballast stripping apparatus which shall include a main frame and pneumatic tired supporting wheels therefor together with means for driving the supporting wheels.

In our previously filed application, Serial No. 629,180, filed November 16, 1945, we have shown, described and claimed a ballast stripping machine embodying a reciprocable motor driven augur which enters the spaces between adjacent cross ties to remove the ballast therefrom. This machine has proven eminently satisfactory in service, but being adapted to run solely on the rails of a railroad track, its use is limited in sections where heavy traffic prevails due to the necessity of frequently taking siding for passing trains. The present apparatus differs from that of our prior application in that it is self-propelled alongside the track from which ballast is being stripped and such parts as overhang the track may be quickly moved out of the way for passing trains.

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

Fig. 1 is a plan view, partly diagrammatic and partly in section, taken along the line I—I of Fig. 2;

Fig. 2 is a side elevational view;

Fig. 3 is a detail sectional view taken along the line III—III of Fig. 1 showing means for securing the truck frame to the end of the transverse frame; and

Fig. 4 is a detail view showing the means for raising and lowering the main frame with respect to the main supporting wheels.

Referring now to the drawings for a better understanding of our invention, we show a fragment of a railroad track embodying a rail 10 and cross ties 11 from between which our machine is adapted to remove the ballast. Our improved apparatus embodies a main frame made up of a pair of channels 12 and 13 joined together at the ends by cross members 14 and 16. Joined to the main frame on the under side thereof is a transverse frame composed of channel members 17 and 18. As will be seen from Fig. 1 of the drawing, the channel members 12 and 13 of the main frame have their flanges extending outwardly of the frame while the channel members 17 and 18 composing the transverse frame have their flanged portions extending inwardly of the frame. The channel members 17 and 18 at their outer ends overhang the ends of the cross ties 11 and are joined together at their ends by means of cross members 19 and 20.

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There is also provided a truck frame comprising a pair of relatively light channel members 21 and 22 with their flanges extending outwardly and joined together at the ends by means of cross members 23 and 24. Journalled between the longitudinal members 21 and 22 of the truck frame, near the ends thereof, are a pair of wheels 26 and 27, the wheels each having flanges on both sides thereof which are adapted to engage the sides of the rail 10 as shown in Fig. 1. The truck frame is pivotally connected to the main frame member 12 by means of bars 28 and 29 which are secured near one end to the truck frame member 22 and hingedly connected to the main frame member 12 by means of bolts 31 and 32. Similarly, near the other end of the truck frame, bars 33 and 34 are secured to the truck frame member 22 and are hingedly connected to the main frame member 12 by means of bolts 36 and 37. The truck frame just described is detachably connected to the transverse frame, as shown in Fig. 3 of the drawing, by means of I-bolts 38 pivotally mounted, one in each of the transverse frame members 17 and 18, and extending upwardly through a slot 39 in the transverse frame member and through slots 41 and 42 in the truck frame member 22. A wing nut 43 on the upper end of the I-bolt provides means whereby the transverse frame may be quickly connected to, and detached from, the truck frame. When the truck frame is disconnected from the transverse frame, it may be raised up out of the way by any suitable means, such as the hand operated winch 44 and cable 46. When the truck frame is thus raised out of the way, the transverse frame members 17 and 18 rest on the adjacent ends of the cross ties 11 in the clear of passing trains.

At 47 and 48 we show main supporting wheels which are mounted between the main frame members 12 and 13. The wheel 47 is journalled in the outer end of a pair of links 49 and 51 which are pivotally connected at their opposite ends to brackets 52 and 53, secured to the transverse frame member 17. The wheel 48 is journalled in the ends of links 54 and 56 which are pivotally connected at their opposite ends to brackets 57 and 58 secured to the transverse frame member 18.

Secured to the main frame members 12 and 13 and extending upwardly therefrom at the sides of the wheel 47 are a pair of channel members 59 and 61 joined together at the top by means of a cross member 62. Similarly, channel members 63 and 64 are joined to the main frame members 12 and 13 and extend upwardly therefrom at the sides of the wheel 48, said members being joined together at their upper ends by a cross member 66. Mounted on the cross member 62 is a hydraulic cylinder 67 and mounted on the cross member 66 is a hydraulic cylinder 68. The hydraulic cylinders 67 and 68 are joined together at their upper ends by means of a connecting beam 69. The lower end of the hydraulic cylinder 67 is joined also to the main frame members 12 and 13 by means of diagonal braces 69' and 71, while the cylinder 68 is joined to the main frame members by means of diagonal braces 72 and 73. The piston rod 74 of the hydraulic cylinder 67 is connected at its lower end to a cross head 76 which is slidably mounted in the channel guides 59 and 61. Extending downwardly from the cross head 76 are lateral members 77 and 78. The member 77 is joined by a pair of short links 79 to a lug 81 on the end of the link 49, and the member 78 is joined by a pair of short links 82 to a lug 83 on the outer end of the link 51. The piston rod 84 of the hydraulic cylinder 68 is connected at its lower end to a cross head 86 from which members 87 and 88 extend downwardly in the channel guides 63 and 64, and are connected at their lower ends to the links 54 and 56 in a manner already described for the members 77 and 78 and which does not require repetition. It will be seen, with the arrangement just described, that when the hydraulic cylinders 67 and 68 are operated to raise and lower the cross heads 76 and 86, the main frame members 12 and 13 are raised and lowered accordingly with respect to the main supporting wheels 47 and 48.

At 87 we show a prime mover, for example, a gasoline motor, which drives an electric generator 88, which delivers electric current through a circuit 91. At 92 we show a pump which is operatively connected to the motor 87 and which pumps a suitable liquid from a reservoir 93 to develop pressure for the operation of the hydraulic cylinders 67 and 68. A valve 94 within easy reach of the operator of the apparatus is adapted to deliver fluid under pressure to the hydraulic cylinders 67 and 68 and back to the reservoir 93 through conduits 96, 97, 98 and 99 in a manner well understood in the art. The apparatus is propelled along the track by means of a reversible motor 101 mounted between the longitudinal frame members 12 and 13 and driving the main supporting wheel 47 through sprockets 102 and 103 and sprocket chain 104. The motor 101 is controlled by means of a reversing switch 106 which is within easy reach of the operator of the machine.

The augur for stripping the ballast is shown at 107 and is provided with a shaft 108 carried in suitable bearings 109 and 111, mounted in the lower portion of a housing 112. It will be seen from Fig. 2 of the drawing that that portion of the housing 112 in which the bearings 108 and 109 are mounted is narrow enough to enter freely between the adjacent ends of the cross ties 11. The housing 112 is provided with supporting wheels 113, 114, 115 and 116 which ride on the lower inturned flanges of the channel members 17 and 18 and are of such diameter, as may be seen in Fig. 2, as to engage the upper flanges of said channels should the housing 112 tend to rise when the augur meets an obstruction. A cover plate 117 on the housing 112 prevents dirt or grit from entering the housing from above. The augur 107 is driven by means of a motor 118, mounted in the housing 112. Mounted on the end of the shaft 108 is a pulley 119 and mounted on the end of the motor shaft 118 is a pulley 121 which drives the pulley 119 and shaft 108 through a V belt 122. The motor 118 is controlled by means of a switch 123, provision being made, as indicated diagrammatically by the loops 124 and 126, to allow for reciprocation of the housing 112 with the motor 118.

The housing 112, and with it the augur 107, is reciprocated by means of a reversible motor 127, controlled by a reversing switch 128. The motor 127 drives a small winch 129 around which is wound a cable 131. The ends of the cable 131 are connected at 132 to the housing 112 and are trained over sheaves 133 and 134 at one end of the transverse frame and over sheaves 136 and 137 at the opposite end of the transverse frame.

From the foregoing, the operation of our improved apparatus will be readily understood. The machine is placed alongside the track from which the ballast is to be stripped, with the outer end of the transverse frame members 17 and 18 overhanging the adjacent ends of the cross ties 11. The truck wheels 26 and 27 are placed on the rail 10 and the transverse frame connected to the truck frame by means of the eye bolts 38 and nuts 43. The augur 107 is leveled up with respect to the track by means of the hydraulic cylinders 67 and 68 which are operated to raise and lower the main frame as may be necessary. The augur 107 is then entered between a pair of cross ties, and is rotated and reciprocated to remove the ballast from between the ties, the flanged wheels 26 and 27 resisting the thrust of the augur. The apparatus is moved by means of the driving motor 101 so that the augur may be entered between the next adjacent cross ties, and so on. In event it becomes necessary to get the apparatus out of the way of passing trains, it is only required that the transverse frame members 17 and 18 be detached from the truck frame member 22 by loosening the nuts 43 on the eye bolts 38 and then swinging the truck frame up out of the way by means of the winch 44, allowing the transverse frame members 17 and 18 to rest on the ends of the ties. The machine is then entirely in the clear of passing trains.

From the foregoing it will be apparent that we have devised an improved machine for removing ballast from between the cross ties of a railroad track which is operable alongside the track, is easily placed in the clear of passing trains; which is self-propelled, and which is adaptable for operation at various levels of road bed.

While we have shown our 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 we desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What we claim is:

1. In apparatus for stripping ballast from between the cross ties in a railroad track, a main frame extending alongside the track, supporting wheels for the main frame at least one of which is motor driven, transverse frame members joined to the main frame and overhanging the ends of the cross ties, and a reciprocable motor driven augur carried by the transverse frame and adapted to enter between the cross ties.

2. In apparatus for stripping ballast from between the cross ties in a railroad track, a main frame extending alongside the track, supporting wheels for the main frame at least one of which is motor driven, transverse frame members joined to the main frame and overhanging the ends of the cross ties, a reciprocable motor driven augur carried by the transverse frame and adapted to enter between the cross ties, a pair of flanged supporting wheels for the overhanging end of the transverse frame members, a frame for the flanged wheels pivotally connected to the main frame, means for detachably connecting the transverse frame members to the frame for the flanged wheels, and means to raise the flanged wheels and frame therefor off the rail and out of the way.

3. In apparatus for stripping ballast from between the cross ties in a railroad track, a main frame extending alongside the track, supporting wheels for the main frame at least one of which is motor driven, vertically movable members in which the supporting wheels are journalled, transverse frame members joined to the main frame and overhanging the adjacent ends of the cross ties, a reciprocable motor driven augur carried by the transverse frame and adapted to reciprocate between the cross ties, a pair of flanged supporting wheels for the overhanging end of the transverse frame members, a frame for the flanged wheels pivotally connected to the main frame, means for detachably connecting the transverse frame members

to the frame for the flanged wheels, means to raise the flanged wheels and frame therefor off the rail and out of the way, and means to raise and lower the main frame with respect to its supporting wheels.

4. In apparatus for stripping ballast from between the cross ties in a railroad track, a main frame comprising spaced parallel members extending alongside the track, transverse frame members rigidly joined at one end to the main frame and overhanging the adjacent ends of the cross ties, a reciprocable motor driven ballast removing augur carried by the transverse frame and including a housing having a narrow portion adapted to enter between adjacent cross ties, supporting wheels for the main frame at least one of which is motor driven, links pivotally connected to the transverse frame in which the supporting wheels are journalled, means to raise and lower the main frame with respect to its supporting wheels, flanged wheels for supporting the overhanging end of the transverse frame and disposed to engage and ride on the adjacent rail, a frame for the flanged wheels pivoted to the main frame, and means for detachably securing the frame for the flanged wheels to the transverse frame.

5. Apparatus as defined in claim 4 in which the means to raise and lower the main frame with respect to its supporting wheels comprises a pair of hydraulic cylinders having pistons operatively connected to the ends of the links in which the wheels are journalled.

6. Apparatus such as defined in claim 4 in combination with an electric motor mounted in the housing for driving the augur, tracks formed by the transverse frame members, wheels on the housing disposed to travel on the tracks, an augur shaft extending into a relatively narrow portion of the housing beneath the motor, and a driving connection between the motor and the augur shaft.

7. Apparatus such as defined in claim 4 in combination with a winch for swinging the frame carrying the flanged wheels up out of the way when it is disconnected from the transverse frame members.

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