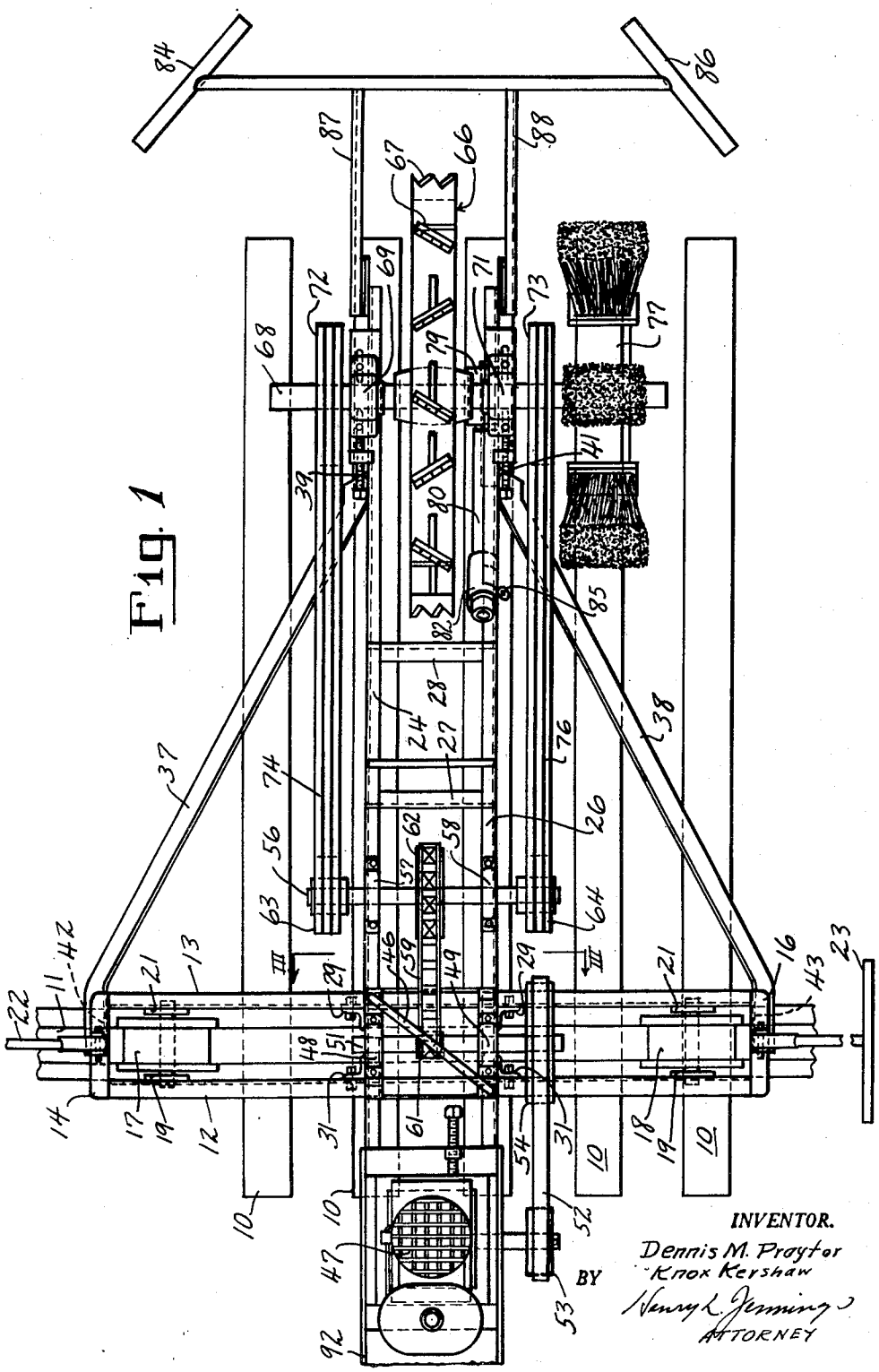
Dec. 19, 1950 D. M. PRAYTOR ET AL 2,534,880

BALLAST REMOVING MACHINE

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Fig. 1



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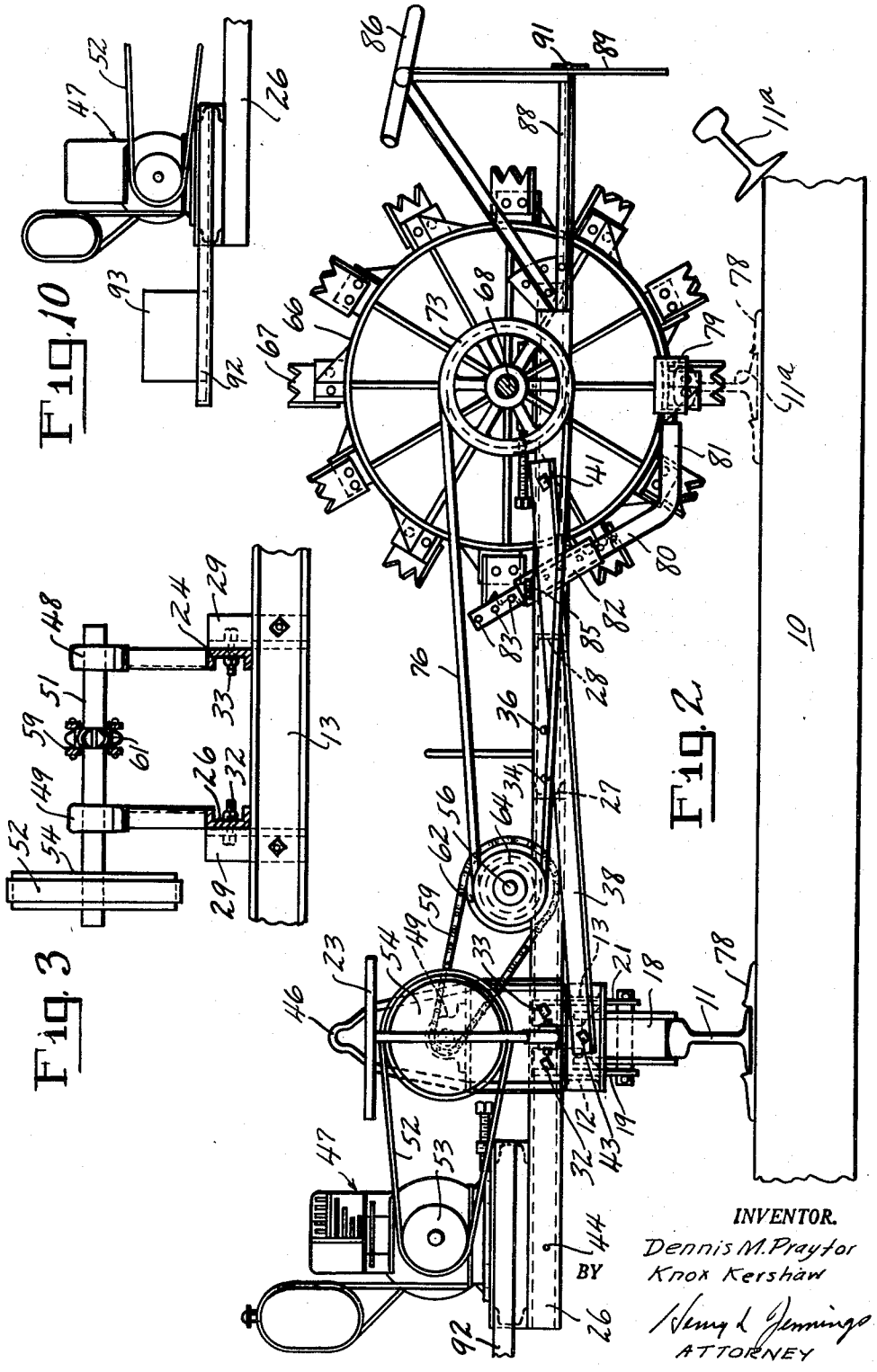


Fig. 10

Fig. 2

Fig. 3

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BALLAST REMOVING MACHINE

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Fig. 6

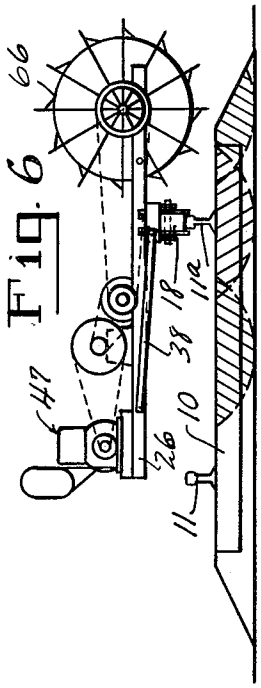


Fig. 7

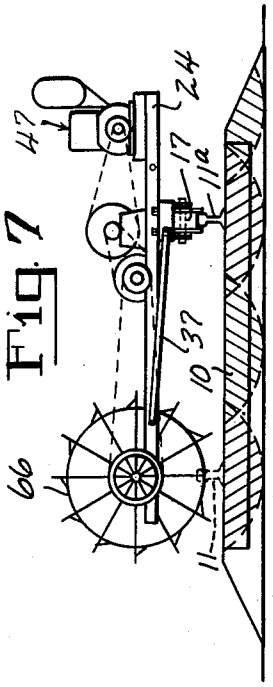


Fig. 8

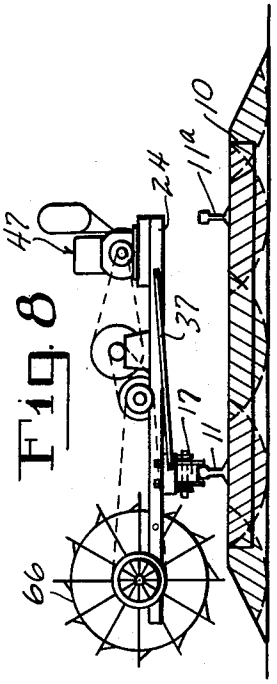


Fig. 4

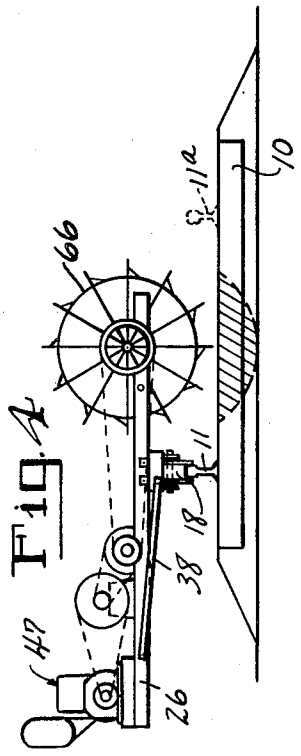


Fig. 5

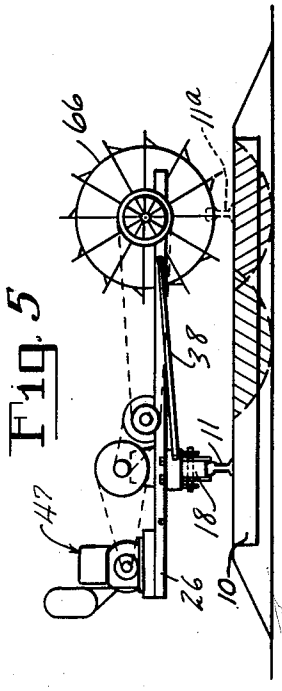
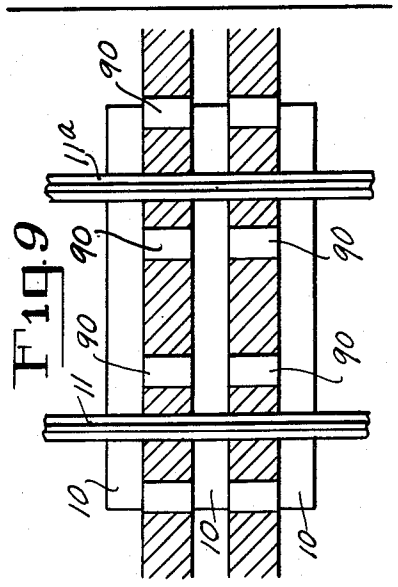


Fig. 9



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BALLAST REMOVING MACHINE

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Application October 14, 1946, Serial No. 703,262

3 Claims. (Cl. 37—104)

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This invention relates to a machine for removing ballast mechanically from between railroad cross ties and has for an object the provision of apparatus of the character designated which shall be adapted to travel and be supported on one rail only of the track and to remove ballast from between the cross ties by means of an excavating member adjustable to a plurality of positions across the road bed.

A further object of our invention is to provide apparatus for removing ballast from between railroad track ties when relaying rails, and simultaneously therewith to clean the adjacent ties for subsequent adzing.

As is well known in the art to which our invention relates, when relaying railroad rails, after a rail has been removed, the cross ties from which it has been removed must be trimmed with an adzing machine to fit the tie plates employed with the new rail being laid. In order to use the adzing machine, it is necessary that all rock and ballast be removed from between the cross ties at that location or else the adzing machine cannot operate. After ballast has remained in a railroad track for a period of years, and has become thoroughly packed down it is a very laborious operation to remove it manually, so much so that it is prohibitive in cost. Further, when relaying cross ties, it is necessary to loosen and remove a large portion of the ballast clear across the road bed around the ties to be removed, in order that the ties may be pulled out, and new cross ties put in their places. It is accordingly a prime object of our invention to provide a simple and relatively inexpensive machine which shall be adapted to travel on one rail only of the railroad track, and which shall include a digging unit adapted to operate selectively, in a plurality of positions across the road bed to strip the track of ballast.

More particularly, this invention is an improvement on that disclosed in our previously filed application, Serial Number 619,996, filed October 3, 1945, now abandoned, in that it provides greater flexibility in operation, and provides for cleaning the upper surfaces of the ties as the ballast is being removed.

These and other features of our invention are illustrated in the accompanying drawings, forming a part of this application, in which

Fig. 1 is a plan view of the apparatus with parts broken away at one end;

Fig. 2 is a side elevation thereof and with the tie brush removed;

Fig. 3 is a sectional view taken along the line III—III of Fig. 1;

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Figs. 4 to 8 inclusive are diagrammatic views showing the apparatus in various positions;

Fig. 9 is a diagrammatic view showing the portions of the railroad road bed from which ballast may be removed by means of our improved machine; and

Fig. 10 is a view in elevation showing the support for counterweights on the end of the machine.

Referring now to the drawings for a better understanding of our invention, we show in Figs. 1 and 2 a railroad bed with cross ties 10 and with a single rail 11 mounted on the cross ties, it being assumed that the opposite rail has been removed in a relaying operation. Our improved apparatus is shown mounted on the rail 11 and comprises longitudinal members 12 and 13 joined together at their ends by means of cross members 14 and 16. Tandem, double flanged, supporting wheels 17 and 18 are journalled in similar brackets 19 and 21 secured to the longitudinal members and extending downwardly therefrom. At the end of the frame are handles 22 and 23 for manual propulsion of the apparatus along the rail.

Mounted on the main frame just described intermediate its ends, is a transverse frame comprised of parallel beams 24 and 26 joined together intermediate their ends by cross members 27 and 28. Each of the transverse frame beams is joined to the main frame, as shown in Fig. 3 of the drawing by means of upwardly extending angle brackets 29 and 31 which are joined to the longitudinal frame members 12 and 13 and are connected to the parallel beams of the transverse frame by means of bolts 32 and 33. At 34 and 36 we show additional bolt holes in the parallel beams 24 and 26 whereby the frame may be shifted bodily to the left from the position shown in Figs. 1 and 2 and secured to the main frame as just described. Lateral braces 37 and 38 are connected, in the position shown in Figs. 1 and 2 of the drawings, to the parallel beams 24 and 26 at 39 and 41 and are connected to the end members 14 and 16 of the main frame at 42 and 43. Bolt holes 44 are provided in the parallel beams 24 and 26 (only one being shown) to which the outer ends of the braces 37 and 38 are connected when the transverse frame is shifted as just described. Secured to the transverse frame is a lifting loop 46 whereby the apparatus may be picked up and handled by means of a crane.

Mounted on one end of the transverse frame, on one side of the rail 11 is a power unit 47, illustrated as an internal combustion engine. Also mounted on the transverse frame, in bearings 48 and 49, is a countershaft 51 which is driven from

the power unit 47 by means of a belt 52 and pulleys 53 and 54. A second countershaft 56 is mounted on the transverse frame in bearings 57 and 58 and is driven by means of a sprocket chain 59 and a relatively small sprocket wheel 61 mounted on the countershaft 51 and a relatively large sprocket wheel 62 mounted on the countershaft 56. Multiple V belt pulleys 63 and 64 are mounted on the ends of the countershaft 56.

Mounted on the opposite end of the transverse frame from the power unit 47 and on the other side of the rail 11 therefrom is a digging unit comprising a wheel 66 having digging members removably mounted thereon. The digging members 67, as shown in Fig. 2 comprise toothed metal plates. The wheel 66 is mounted on a shaft 68 which in turn is journalled in bearings 69 and 71 carried respectively by the parallel beams 24 and 26. The shaft 68 has mounted thereon multiple V belt pulleys 72 and 73 by means of which the digging unit is driven from the countershaft 56 by means of belts 74 and 76. Mounted on one end of the shaft 68 is a rotary brush 77 which, as shown in Fig. 1 of the drawing, overhangs one of the cross ties 10 while the digging unit 66 is positioned between a pair of other cross ties. The brush 77 serves to remove any ballast from the upper surfaces of the cross ties so that they will be in condition for an adzing machine to prepare the upper surface thereof to receive a tie plate 78. The brush 77 may be adjusted longitudinally of the shaft 68 to accommodate the spacing of the cross ties 10.

At 79 we show a roller mounted alongside the digging unit 66 which is adapted to rest on the rail 11*a* when the rail is in place so that the machine may be moved from place to place when it is not in use. The roller, as shown in Fig. 1, is mounted on a pipe section 80 bent at the bottom to provide a horizontal portion 81 on which the roller 79 is mounted. A sleeve 82 secured to the beam 26 receives the upper end of the pipe section 80. The upper end of the pipe section 80 is provided with a plurality of holes 83 and the sleeve 84 is provided with a single hole for receiving an adjusting pin 85 by means of which the position of the rollers 79 may be varied. The roller 79 may also serve as a depth gauge when raised to the position shown in Fig. 2, to limit the depth to which the digging unit will remove the ballast. On the outer end of the transverse frame we provide handles 86 and 86 by means of which the digging unit may be held in engagement with the ballast when in use. The handles 84 and 86 are mounted on brackets 87 and 88 extending outwardly from the ends of the transverse frame. At 89 we show a support which is hinged at 91 to the bracket 88 and which serves to support the outer end of the unit when it is idle. When in use, support 89 folds upwardly out of the way. In Fig. 10 of the drawing we show a bracket 92 which extends outwardly from the end of the transverse frame adjacent the power unit 47 on which one or more weights 93 may be placed to counterbalance the digging unit 66.

Referring now to Figs. 4 to 8 inclusive, we illustrate the manner of mounting and use of our improved apparatus when removing ballast from various positions across the road bed, particularly when relaying cross ties as well as rails. In Fig. 4 of the drawing we show the transverse frame shifted from the position shown in Fig. 2 of the drawing so that the digging unit 66 is disposed over the center of the road bed and the power unit 47 is disposed beyond the outer outlines of the road bed. In this position the digging unit displaces the ballast from the center of the track. In Fig. 5 of the drawing we show the power unit 47 and digging unit 66 disposed, as shown in Fig. 2 of the drawing, with the digging unit 66 over the portion of the road bed from which the rail has been removed. In this position the digging unit 66 removes the ballast from that portion of the road bed beneath the position of the removed rail. In Fig. 6 of the drawing we show the transverse frame mounted on the main frame as in Fig. 4 but with the machine mounted on the opposite rail 11*a* so that the digging unit 66 is in position to remove the ballast from between the outer ends of the ties 11. This operation may follow directly behind the replacing of the rail 11*a* shown in the right hand side of the drawing, or just ahead of the relaying of cross ties, as the case may be. In Fig. 7 of the drawing, the transverse frame is shown positioned as in Figs. 2 and 5 of the drawing but with the machine turned around so that the digging unit 66 is over the left hand rail 11, as viewed in the drawing. This position is assumed after one side of the track has been relaid and the track stripped. The operations shown serve to strip the ballast from between the other ends of the cross ties 11 and for this purpose left hand rail 11, of course, is removed. In Fig. 8 of the drawing, we show the transverse frame positioned as in Figs. 4 and 6 of the drawing but with the machine turned around so as to strip the ballast from between the outer ends of the cross ties 11.

In Fig. 9 of the drawing we show diagrammatically the pattern of ballast removal accomplished by the apparatus when positioned as shown in Figs. 4 to 8 of the drawing. It will be seen that there are left a plurality of small ridges 90 at intervals across the road bed which are undisturbed so that there is maintained the original line, surface, and tie spacing of the track. Thus, when one of the cross ties 10 is removed and a new cross tie is put in its place, the surface of the seat occupied by the old cross tie will remain the same and the ridges of ballast 90 remaining in the road bed serve to position the new cross tie in the exact place from which the old tie was taken.

From the foregoing it will be seen that we have devised an improved ballast removing machine which is simple and sturdy of construction, which operates to eliminate a large amount of arduous manual labor in the relaying of rail and retimbering of railroad track, and by means of which the ballast may be stripped from a railroad bed quickly and efficiently.

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. Apparatus for removing ballast from between cross ties in a railroad track bed comprising a main frame having tandem supporting wheels adapted to travel on one rail only of the railroad track, a transverse frame, means to secure the transverse frame in a plurality of positions on the main frame, a rotary digging unit mounted on one end of the transverse frame in position to enter the spaces between the cross ties

and remove ballast therefrom, a power unit on the other end of the transverse frame, means to transmit power from the power unit to the digging unit, manual means for holding the digging unit in engagement with the ballast to be removed, and a member adjustably secured to the transverse frame and to limit the depth to which the digging unit will enter between the ties.

2. In apparatus for removing ballast from between the ties of a railroad track bed, a main frame comprised of parallel beams, tandem flanged supporting wheels mounted between the beams and disposed to travel on one rail only of the track, a transverse frame comprised of parallel beams extending crosswise of the track over the main frame with one end overhanging one side of said rail and the other end overhanging the other side thereof, mounting brackets on the main frame, means for securing the transverse frame to the mounting brackets in a plurality of positions, a power unit mounted on one end of the frame, a rotary digging unit at the other end between the beams of the transverse frame and having digging members thereon adapted to enter the spaces between the ties to remove ballast therefrom and deposit the same at a side of the track bed, a shaft for the digging unit journalled in the transverse frame and extending outwardly therefrom, power transmission means from the power unit to the shaft, and a rotary brush on one end of the shaft disposed to remove ballast from the upper surfaces of the cross ties, and deposit it on the same side of the track bed on which the digging unit deposits ballast.

3. In apparatus for removing ballast from between the ties of a railroad track bed, a main frame comprised of parallel beams, tandem

flanged supporting wheels, mounted between the beams and disposed to travel on one rail only of the track, a transverse frame comprised of parallel beams extending crosswise of the track over the main frame with one end overhanging one side of said rail and the other end overhanging the other side thereof, mounting brackets on the main frame, means for securing the transverse frame to the mounting brackets in a plurality of positions, a power unit mounted on one end of the transverse frame, a rotary digging unit at the other end between the beams of the transverse frame and having digging members thereon adapted to enter the spaces between the ties to remove ballast therefrom, a shaft for the digging unit journalled in the transverse frame and extending outwardly therefrom, power transmission means from the power unit to the shaft, an adjustable depending arm on the transverse frame alongside the digging unit, and a roller on the depending arm for engaging the other rail of the track when moving from place to place, and disposed when the apparatus is in operation to limit the depth of cut of the digging unit.

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