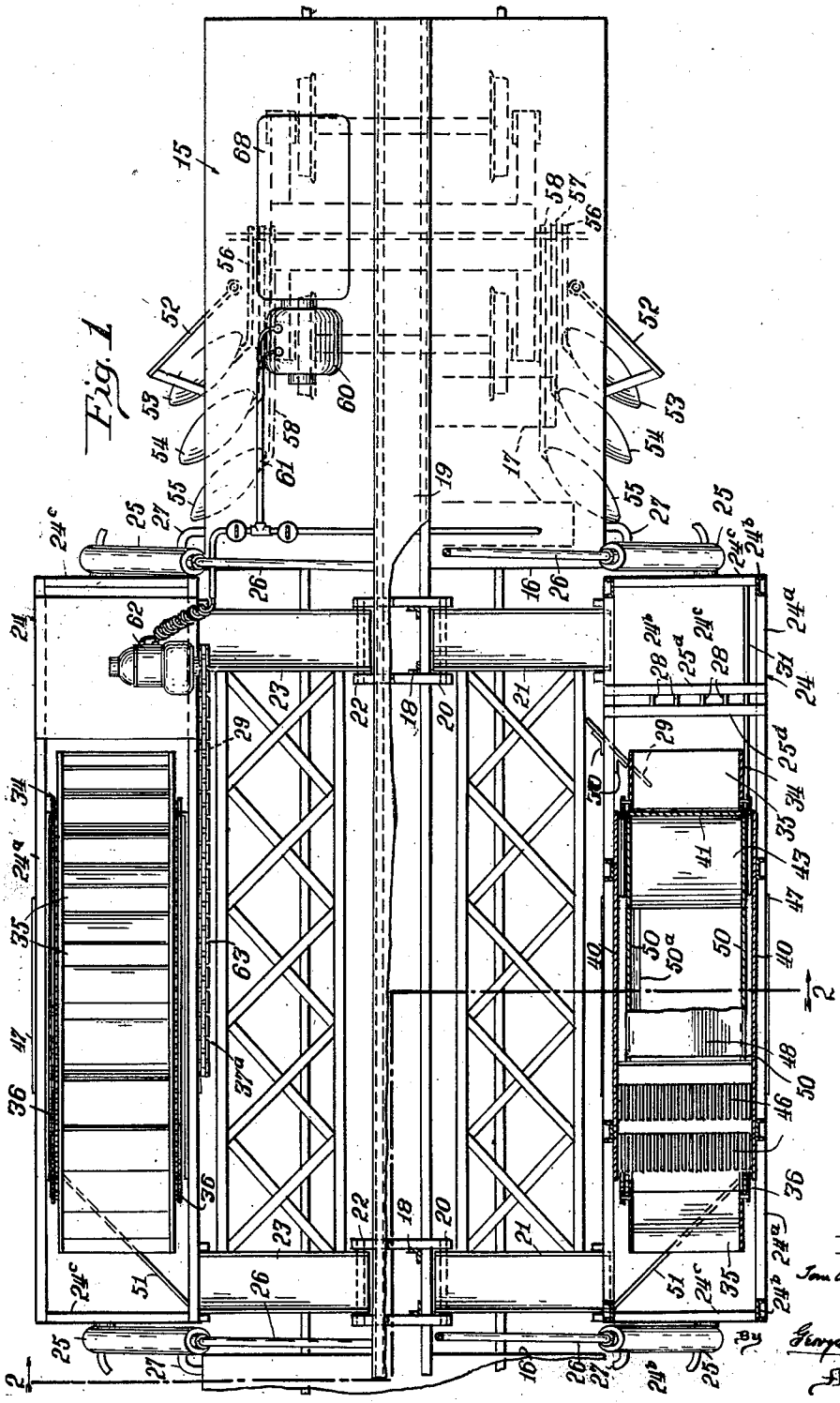
May 26, 1942. T. A. BLAIR 2,284,035

BALLAST CLEANING APPARATUS

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Fig. 1



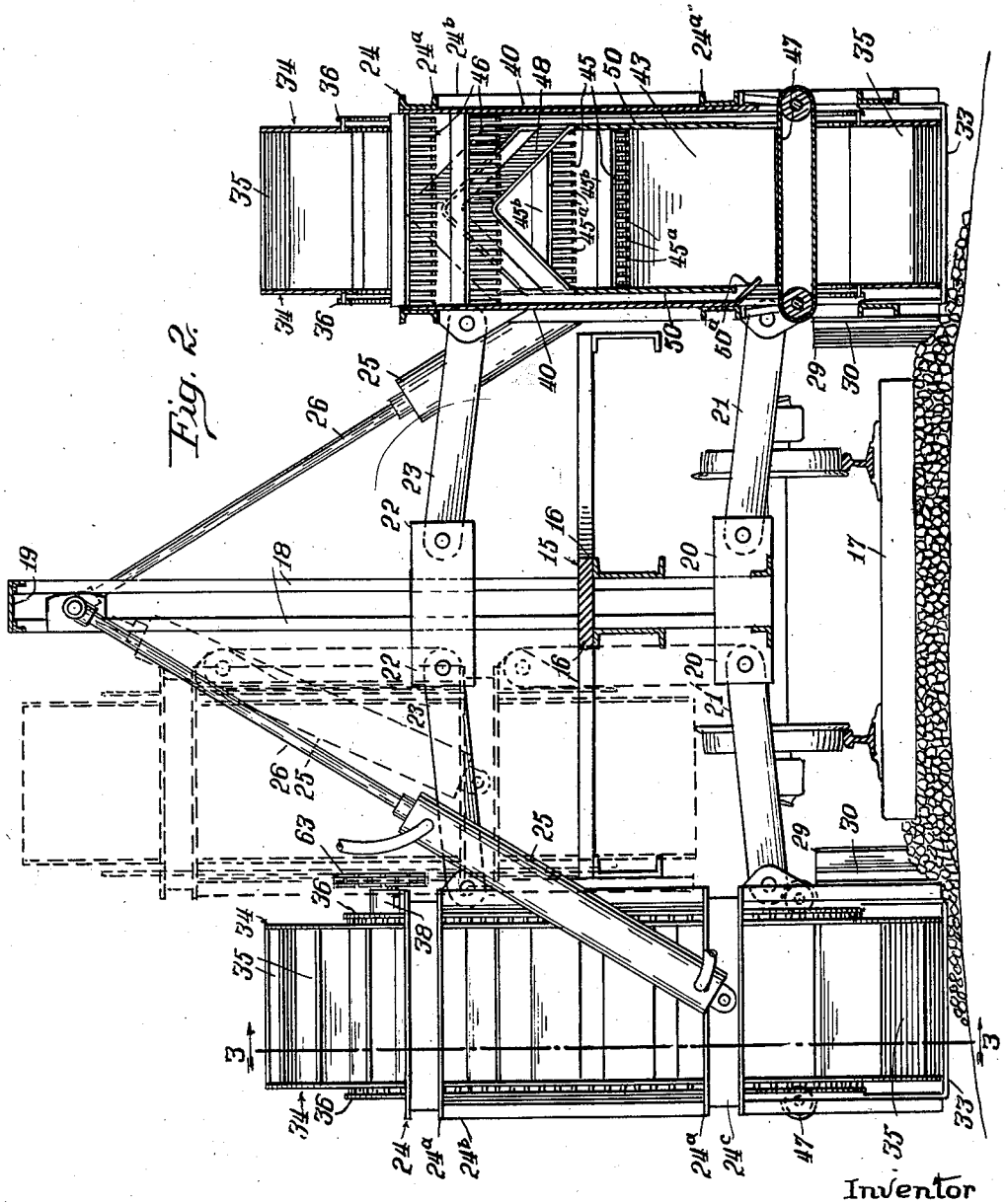
Inventor:
Thomas Arthur Blair
By George Heilmann
Attorney.

May 26, 1942. T. A. BLAIR 2,284,035

BALLAST CLEANING APPARATUS

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Fig. 2.



Inventor
Tom Arthur Blair,
By Fraser Heidman
Attorney.

May 26, 1942. T. A. BLAIR 2,284,035

BALLAST CLEANING APPARATUS

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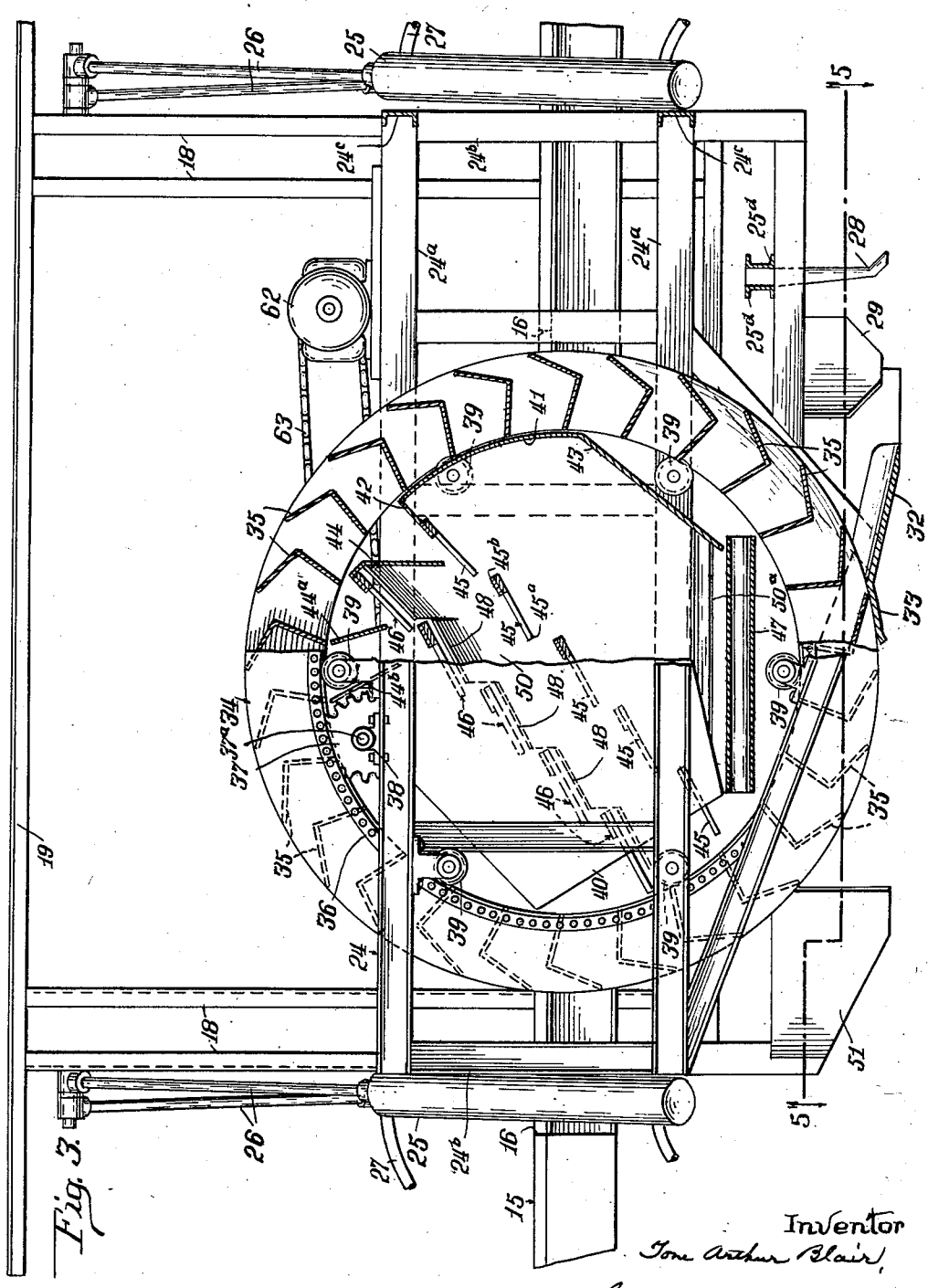


Fig. 3.

Inventor
Thos Arthur Blair,
By Geo. Heidmann
Attorney

May 26, 1942. T. A. BLAIR 2,284,035

BALLAST CLEANING APPARATUS

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Fig 4.

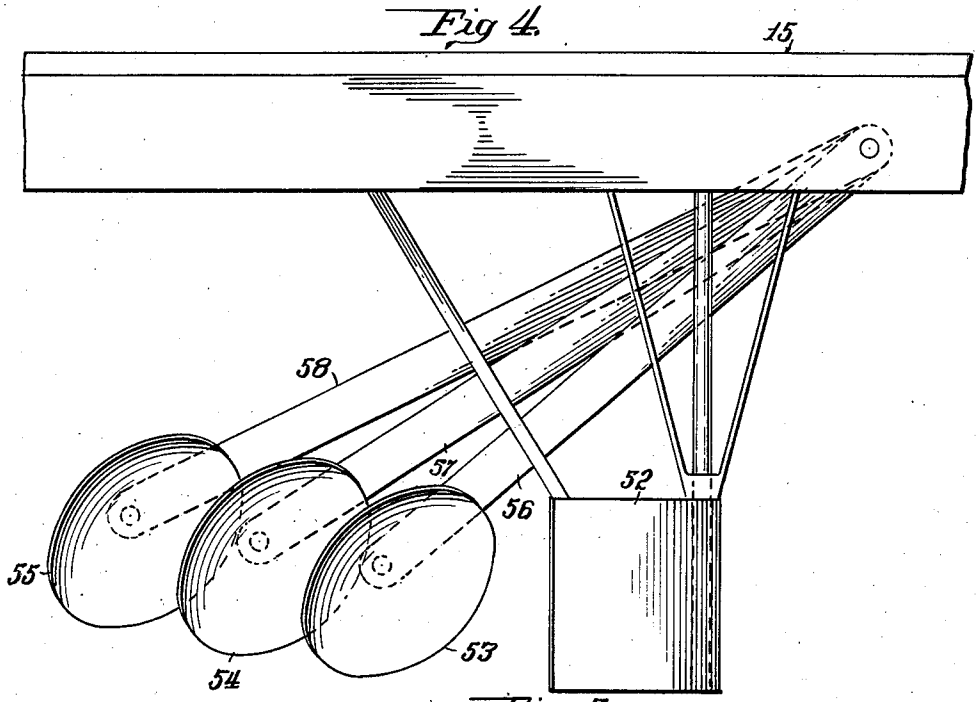


Fig. 5.

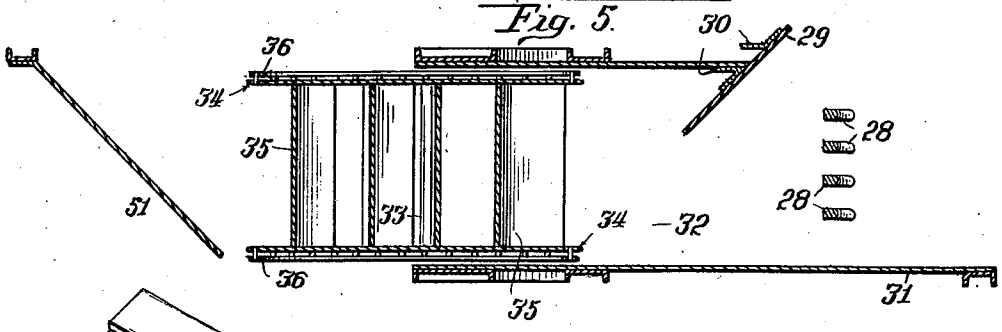
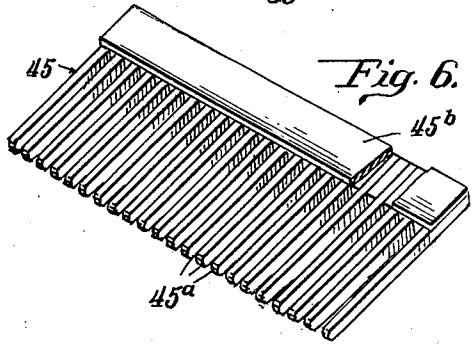


Fig. 6.



Inventor

Tom Arthur Blair,

By George Heidemann.

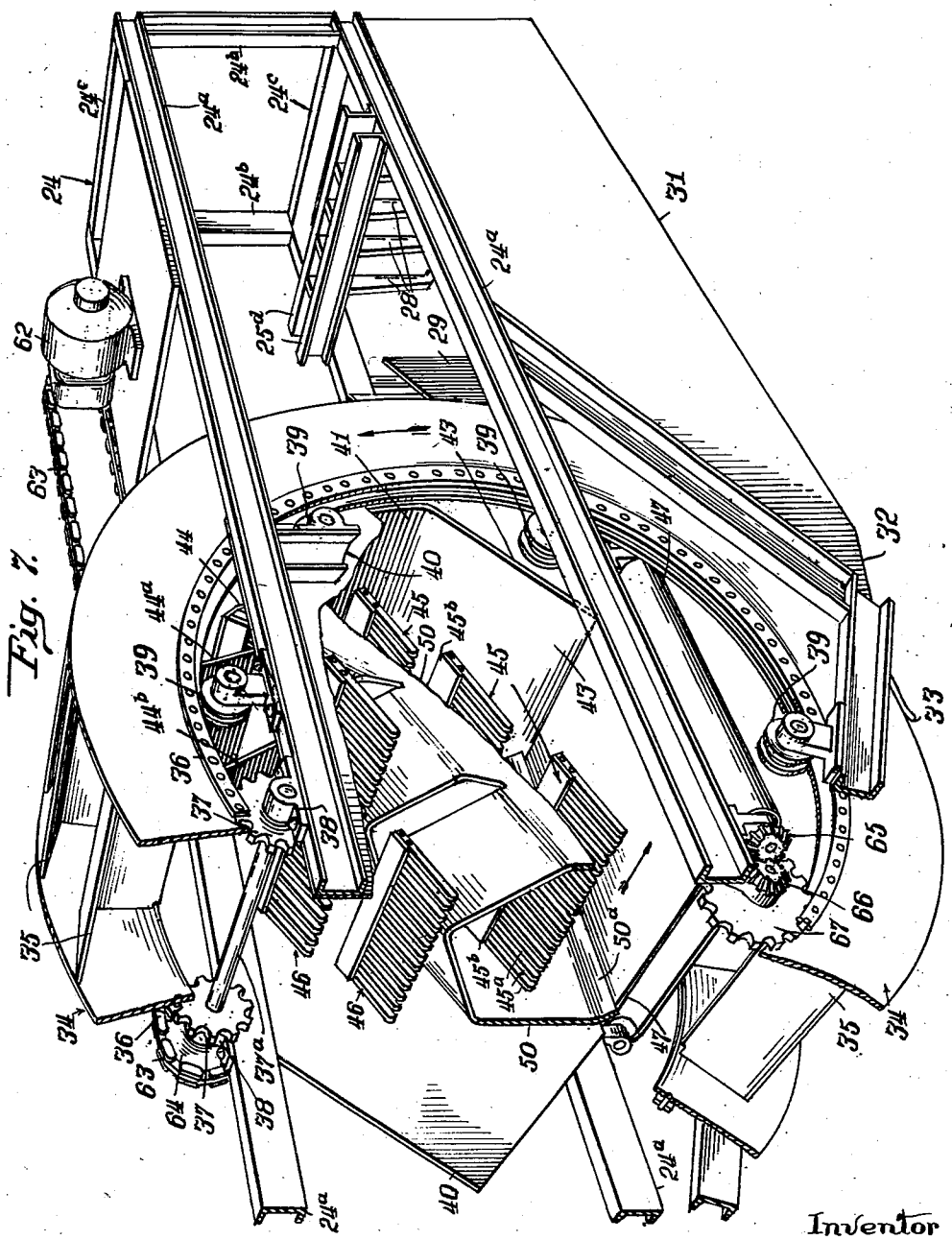
Attorney

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BALLAST CLEANING APPARATUS

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Fig. 7.



Patented May 26, 1942 2,284,035

UNITED STATES PATENT OFFICE

2,284,035

BALLAST CLEANING APPARATUS

Tom Arthur Blair, Amarillo, Tex.

Application May 21, 1941, Serial No. 394,523

14 Claims. (Cl. 262—2)

My invention relates to an apparatus for cleaning the ballast of the shoulders adjacent railroad tracks in order to induce proper drainage; the invention more specifically stated involving a vehicle or car adapted to travel on the tracks (self propelled or otherwise) and provided with adjustable means, operable on the ballast at opposite sides of the track, whereby the ballast is taken up, cleaned, deposited at the track sides and reshaped in its original position at the ends of the track-ties.

The invention also contemplates means which is so mounted and secured on the car that it may be elevated and moved within the vertical planes of the car sides so as not to project beyond the prescribed railroad car clearances when not in use; said means being designed to perform the operations mentioned during movement of the car along the track and to uniformly reshape the cleaned shoulder ballast.

The invention also has for its object the provision of apparatus whereby the functions of cleaning, depositing and reshaping can be performed in a shorter period of time than has heretofore been the case and consequently at a materially less expense.

The objects and advantages of my invention as above recited as well as other advantages inherent in the invention will all be readily comprehended from the detailed description of the accompanying drawings wherein—

Figure 1 is a top plan view of a railroad car with my approved apparatus mounted thereon, with the rear end of the car broken away and the apparatus shown in operative position and a portion shown in section.

Figure 2 is a sectional end elevation as viewed along the line 2—2 of Figure 1.

Figure 3 is a sectional elevation taken on the line 3—3 of Figure 2 looking in the direction of the arrows, with certain portions broken away and shown in section.

Figure 4 is a side elevation of the forward end of the car and apparatus with the forward car truck omitted.

Figure 5 is a longitudinal sectional view taken on the line 5—5 of Figure 3 looking downwardly.

Figure 6 is a detailed perspective view of one of the grizzlies of my apparatus.

Figure 7 is a perspective view with portions broken away and shown in section.

My invention is intended to clean the ballast of the shoulders at opposite sides of a railroad track and to deposit and reshape the cleaned ballast in proper position adjacent the ends of the ties of the track; the apparatus preferably involving a railroad car of the flat car type with portions of its deck at opposite sides of the center sill and intermediate the ends of the car cut out to permit the apparatus to be swung outwardly and downwardly into operative position.

In the specific embodiment of the invention illustrated in the drawings, 15 represents a portion of the car deck which, intermediate the ends is inset or cut away to the center sill 16; the wheels of the forward truck of the car being shown in dotted lines in Figure 1, and the rail supporting ties shown in dotted lines at 17 in Figure 1 and in full lines in Figure 2.

The apparatus involves a gallows frame consisting of suitable uprights or posts 18 of predetermined height and extending downwardly between the two channel members of the center sill 16 to which they are suitably secured; the posts 18 being arranged at opposite ends of the recesses in the car deck and the tops of the posts preferably connected by a suitable top plate or angle bars as indicated at 19 in Figure 2, while the lower ends of the posts, beneath the car deck 15, are provided with suitable brackets 20 to which the inner ends of the links or arms 21 are pivotally connected so as to swing through vertically disposed arcs. The uprights 18, intermediate their ends, are also provided with laterally disposed brackets 22 located a distance above the car deck, see Figure 2, to provide pivotal support for the links or arms 23.

The outer ends of the arms 21 and 23 are pivotally connected to a box-like skeleton frame 24 consisting of the longitudinal members 24^a, tie-bars 24^b and cross-bars 24^c. Similar frames with associated elements are employed on both sides of the car, as shown in Figures 1 and 2, and these frames (which are constructed of channel bars) are preferably raised and lowered by means of pneumatic or hydraulic cylinders and pistons arranged at each end of each frame as shown in Figure 1; the cylinders 25 at one of their ends are pivotally secured to one of the cross-bars or members 24^c of the frames while the outer ends of the pistons 26 are pivotally connected to the gallows frame adjacent the top thereof as shown in Figure 2. The upper ends of cylinders 25 are intended to receive pressure medium from a suitable source of supply by means of hoselines as indicated at 27 in Figure 2; the pressure medium being introduced intermediate the end wall of the cylinder and the piston-head when it is desired to lift the frames upwardly and within the vertical planes of the car sides

as shown in dotted lines at the left in Figure 2; the upward and inward swinging of the frame being induced by the pivoted links or arms 21, 23; the frames in Figure 2 being shown in lowered operative position.

The forward ends of the frames (namely the ends to the right in Figures 1 and 3) are provided with spaced apart cross-bars 25[a] (see Figure 1) between which a plurality of depending scarifiers 28 are mounted whereby the shoulder ballast is stirred and loosened; the scarifiers being arranged in sufficient number transversely of each frame 24 in keeping with the width of the shoulder.

The forward ends of the frames rearward of the scarifiers 28 are each provided with a rearwardly slanting blade 29 secured at the inner end to a post 30 depending from the inside portion of the frame, namely the side disposed toward the car and hence adjacent the ends of the ties 17; the blades 29 (preferably somewhat tapered toward the lower ends as shown in Figure 3) plow out and guide the scarified ballast toward the center beneath the frames 24. The outer sides of each frame 24 at its bottom are provided with depending guide plates 31 whereby the ballast plowed out by the blade 29 and scarifiers 28 is confined to the path of ballast pick-up and elevating mechanism hereafter described. The lower ends of frames 24 at the rear ends of the guide plates 31 are each provided with a downwardly and forwardly sloping scoop 32 arranged transversely of the frame 24 and terminating at its upper end in a rearwardly sloping guide plate portion 33, see Figure 3; the scoops 32, extending to the bottoms of the guide plates 31, are adapted to cut beneath the ballast and deliver it to the elevating mechanism now to be described.

Rotatably mounted in each box-like or skeleton frame 24 is a ballast elevating wheel composed of two spaced apart annular plates 34 between which a plurality of triangular shaped ballast elevating buckets 35 are mounted; the sides of the buckets being suitably connected to the annular side plates 34; the buckets as is apparent from Figure 3, being open at opposite ends so as to receive the ballast from the scoop 32 and the guide plate 33 during counter-clockwise rotation of the wheel as viewed in Figure 3, with the car moving forwardly or to the right in said figure.

The outer sides of the wheel side plates, adjacent the inner perimeters, are provided with annular racks 36 with which the gears 37 mesh; the gears 37 being journaled in suitable bearing blocks as at 38 which are mounted on the stationary frames 24. I prefer to employ a rack-and-gear drive at both sides of the wheels to avoid improper thrusts; the gears 37 being driven at a predetermined speed by any suitable power imparting mechanism.

The elevating wheels are rotatably supported by a plurality of flanged guide wheels 39 supported on the stationary frames 24 so as to engage the inner perimeters of the wheel side plates 34 at circumferentially spaced points as shown in Figure 3.

Secured within each stationary frame 24 are one or more side plates 40; and between the side plates 40 at opposite sides of the frame and secured thereto adjacent the inner perimeter of the elevating wheel at its upward going side is an arcuate closure plate 41 (see Figure 3) whose upper edge is provided with a downwardly sloping flange 42, while the lower end of the closure plate terminates in or is provided with a rearwardly and downwardly sloping dirt guide plate 43 adapted to direct the dirt, separated from the ballast discharging from the buckets, onto conveyor means later to be described; it being understood that the arcuate closure plate 41 and dirt plate 43 extend throughout the width of the ballast elevating wheel; the plates 41 and 43, however, being fixedly secured to the stationary frame 24.

Immovably secured to the upper rails of the stationary frames 24 and extending throughout the width of the wheel is a vertically disposed baffle plate 44 arranged a suitable distance from the flanged end 42 of the closure plate 41 to provide a hopperlike structure for guiding the ballast, discharging from the upwardly moving buckets 35 when they pass beyond the upper end of the closure plate 41, onto the dirt separating elements or grizzlies indicated at 45 arranged in vertically spaced relation and in downwardly sloping manner toward the rear and downwardly moving portion of the elevating wheel. The grizzlies are preferably arranged at different prearranged degrees of tilt and preferably merely supported adjacent their upper ends so as to cause the lower unattached ends to more or less vibrate as a result of the jars encountered during rotation of the elevating wheel and forward movement of the car. The grizzlies or grilles are of a well known construction consisting of parallel and closely arranged bars or rods 45[a] with a connecting plate portion 45[b] at the upper ends thereof (as shown in Figure 6) which is secured to the side plates 40, while the other or lower ends of the rods 45[a] of the grille are free to vibrate; the grizzlies being so arranged that the ballast will discharge from the upper grille or grizzly onto the next succeeding grizzly, causing the dirt to be separated from the ballast and to drop between the grille and onto a transversely traveling conveyor to be described.

In view of the fact that the buckets during their travel past the hopper formed by the flange 42 of closure plate 41 and baffle plate 44 are not in position to completely discharge the ballast, I prefer to provide a second series of grizzlies 46, similar in construction to grizzlies 45 and similarly mounted and arranged in a suitable downwardly sloping manner so as to discharge the cleaned ballast through the rear downwardly rotating portion of the elevating wheel and onto the track shoulder.

Disposed transversely through the lower part of the wheel and beneath the grizzlies is a belt conveyor 47 whose rollers are suitably supported on the stationary frame at opposite sides of the wheel; the conveyor to be driven in any suitable manner and traveling toward the outside of the frame so as to deliver the dirt onto the earth shoulder beyond the ballast shoulder which is located beneath the frame and wheel.

In order to prevent the dirt separated by the upper tiers of grizzlies falling onto the lower tier I provide additional dirt receiving hood-shape plates 48 arranged within the wheel and disposed between the grizzlies 45 and 46; the plates being secured to the stationary frames and sloping downwardly toward the opposite sides of the frame and discharging into the vertical passages formed between spaced side plates 40, 50 of the frame; the lower ends of the inner vertical passages having inwardly sloping baffles 50[a] which deliver the dirt onto the conveyor belt

47 which in turn discharges the dirt onto the earth shoulder beyond the ballast shoulder.

As shown in Figure 3, the buckets 35 after passing beyond the baffle plate 44 are in such position that any ballast remaining in the buckets will be discharged onto the grizzlies 46; the ballast being directed toward the grizzlies 46 by a pair of circumferentially spaced baffle plates 44^a, 44^b.

The cleaned ballast drops from the lower grizzlies 45, 46 between the buckets 35 at a point rearward of the ballast take-up position of the wheel, passing down through the defined channel formed by the two annular side plates 34 of the wheel and is deposited on the track shoulder rearward of the wheel where it is properly spread and shaped by an angularly disposed blade 51 whose lower edge is sheared or cut away in a rearward and upward manner, as more clearly seen in Figure 3.

The ties of railroad tracks vary in length from eight feet to nine feet and in order that the entire shoulder ballast may be cleaned it is essential to provide means whereby the ballast adjacent the ends of the ties will be plowed loose and moved outwardly into the path of the scarifiers and the take-up scoop adjacent the pick-up position of the elevating wheel. I therefore provide the forward end of the vehicle or car (see Figure 1) with a rearwardly slanting scraper blade 52, suitably supported from the car underframe as for example shown in Figure 4, and preferably with a number of concavo-convex discs 53, 54, 55, arranged at an acute angle relative to the car side, with their concaved sides disposed away from the track so as to throw the ballast outwardly.

Blade 52 is mounted to clear the end of a nine foot tie by approximately one inch and is adapted to plow out ballast from the end of a nine foot tie and leaves a vertical ballast face approximately seven inches from the end of an eight foot tie.

Disc 53 then plows out a two inch cut from the vertical face of the ballast left by blade 52; disc 54 plows out another two inch cut; while disc 55 plows out the remaining two inches at the end of an eight foot tie.

The discs are substantially similar to those of a disc cultivator except that discs 53, 54, 55 are provided with blunt perimeters and the hubs of the discs are secured to the end of links 56, 57 and 58 whose upper ends are pivotally secured to the car underframe as shown more clearly in Figure 4. As the links are pivotally connected to the car frame it is apparent that the discs which encounter the ties or operate between them may ride over the tie-ends and by reason of their blunt perimeters will not cut into the ties.

With the inset arrangement of the discs my improved apparatus adapts itself to varyng conditions encountered along a railroad right-of-way with some ties eight feet and others nine feet in length; the inset spacing between the discs corresponding to the difference in tie length mentioned.

With the concaved sides of the discs arranged in the rearwardly and outwardly slanting manner, the ballast intermediate and at the ends of the ties will be thrown toward the center of the ballast shoulder and in line with the scarifiers 28 and pick-up scoop 32 and hence in position for the buckets of the elevating wheel.

It will be understood that both sides of the car are provided with similar elements, namely with scarifiers 28, plates 29 and 31, a scoop 32, elevating wheel and grizzlies and the ballast shaping blade 51, to the rear of the elevating wheel, whose drive gears 37, namely the gears 37 of the two wheels, are preferably driven by separately controlled means so as to permit the two wheels to be driven at different speeds when desired and the ballast shoulders on both sides of the track simultaneously cleaned and replaced during the forward travel of the car and the separated dirt deposited on the earth shoulders beyond the ballast shoulders so that proper drainage away from the ties on both sides of the track may be provided.

The ballast pick-up wheels preferably are driven by a source of power independent of the power for driving the car.

For example, the car may be provided with a suitably driven electric generator indicated at 60 having current conducting cables 61 leading to motors 62 (one for each pick-up or bucket wheel) suitably mounted in the swinging frames 24, with the outer ends of the armature shafts of the motors provided with sprocket wheels for driving sprocket chains 63 which in turn drive sprocket wheels 64 secured to the inner ends of the shafts 37^a of gears 37 which mesh with the annular racks 36 of the bucket wheels; any suitable means being employed to control the speed of rotation.

Likewise, any well known means may be employed to drive the dirt conveyors 47 at proper speed; the outer rollers of the conveyors constituting the driving shafts or rollers which are provided with suitable bevel gears as shown at 65 which in turn are driven by bevel gears 66, whose shafts are provided with gears 67 which mesh with the annular racks 36 of the bucket wheels.

As is apparent, the flexible driving connections between the source of power and the motors permit the frames to be swung upwardly as indicated in dotted lines in Figure 2, when the apparatus is not in use, by means of the cylinders 25 and their pistons 26, operated by a suitable pressure medium supply mounted on the car.

In actual practice, I employ a Diesel engine indicated generally at 68 for driving generator 60, but other suitable power generating means may be employed if desired.

The exemplification shown and described is believed to be the best embodiment of the invention but certain modifications are possible without, however, departing from the spirit of my invention as defined in the appended claims.

What I claim is:

1. A ballast cleaning apparatus comprising a railroad flat car; a frame mounted on the car to move beyond the car side; a vertically rotating wheel mounted in said frame so as to contact at its bottom with the ballast shoulder at the side of a railroad track, said wheel being provided with a plurality of circumferentially arranged open ended buckets adapted to receive ballast at the outer ends and to discharge the ballast at the inner ends within the wheel; downwardly and rearwardly sloping grizzlies secured to said frame and disposed within the wheel, to receive the ballast discharging through the inner ends of said buckets and to direct the cleaned ballast toward the rear of the wheel; means secured to the frame and disposed within the wheel beneath said grizzlies whereby the separated dirt is discharged beyond the ballast shoulder; and means secured to said frame forward of said wheel for scooping up the ballast and delivering it to the upwardly traveling buckets.

2. A ballast cleaning apparatus comprising a railroad car; a frame secured to the car so as to move beyond the car side; a vertically rotating wheel carried by the frame so as to have its bottom extend therebeneath, said wheel being provided with a plurality of circumferentially arranged open ended buckets adapted to receive the shoulder ballast at the side of a railroad track during forward movement of the car and to discharge said ballast through the inner open ends of the buckets during upward rotation of the wheel; grizzlies secured to said frame and arranged within the wheel for receiving the ballast discharged by the buckets and directing the cleaned ballast toward the rear of the wheel; means disposed within the wheel beneath said grizzlies whereby the separated dirt is discharged beyond the ballast shoulder; and means whereby said wheel is rotated.

3. A ballast cleaning apparatus comprising a railroad flat car transversely recessed intermediate its ends at opposite sides and provided with an upstanding frame at its longitudinal center between the recesses; a box-like frame arranged in each recess at opposite sides of the car and pivotally connected to said upstanding frame so as to swing laterally outward and downward at the car sides; a multiple bucket carrying wheel arranged in each box-like frame and adapted to successively bring its buckets into ballast take-up and discharging position; means mounted on the box-like frames and rotatably engaging the inner perimeters of the bucket-wheels whereby the latter are supported and rotated; ballast screening elements secured to said box-like frames and disposed transversely through the wheels to receive the picked-up ballast discharging from the wheel buckets, said elements being arranged in a downwardly and rearwardly sloping manner to direct the cleaned ballast onto the ballast shoulders at both sides of a railroad track; means arranged in each box-like frame beneath said screening elements for receiving the separated dirt and discharging it laterally beyond the ballast shoulders of the track.

4. A ballast cleaning apparatus comprising a railroad flat car provided with recesses intermediate the car ends at opposite sides; an upstanding frame secured to the car at its longitudinal center and co-extensive with said recesses; a box-like frame arranged in each recess and linked to said upstanding frame so as to swing downwardly outward of the recess beyond the plane of the car-sides and above the ballast shoulder of a railroad track; a vertically disposed wheel arranged in each box-like frame provided with a plurality of ballast carrying buckets rigidly mounted in the perimeter of the wheel, said buckets being open at the outer perimeter and at the inner perimeter of the wheel so as to discharge the ballast within the wheel when the buckets approach the top of their circular orbit; a plurality of rotatable wheel supporting elements in each box-like frame; means whereby the wheels are rotated; ballast screening elements secured in the frames and disposed through the wheels in rearwardly sloping staggered relation adapted to receive the uncleaned ballast discharged from the buckets; means mounted in the frames transversely through the wheels beneath said screening elements whereby the separated dirt is delivered laterally beyond the ballast shoulder; and a ballast pick-up scoop secured to each frame forward of the bottom of each bucket-wheel.

5. A ballast cleaning apparatus comprising a railroad car; a vertically rotating wheel secured to the car so as to be disposed over the shoulder ballast of a railroad track, said wheel being provided with a plurality of circumferentially spaced ballast pick-up buckets adapted to discharge said ballast into the wheel during the upward rotation of the wheel; ballast cleaning means secured to the car and arranged within the wheel in the path of the uncleaned ballast discharged by said buckets, said means being adapted to direct the cleaned ballast toward the rear of said wheel; means arranged within the wheel beneath said cleaning means whereby the separated dirt is discharged beyond the ballast shoulder; and means whereby said wheel is rotated.

6. A ballast cleaning apparatus comprising a railroad car; a vertically rotating wheel pivotally secured to the car to swing outwardly beyond the car side with its lower side disposed over the shoulder ballast at the side of a railroad track, said wheel being provided with closed sided buckets secured at the perimeter of the wheel in circumferentially spaced relation and open at the outer and inner ends whereby the uncleaned shoulder ballast is elevated toward the top of the wheel and discharged through the rear ends of the buckets into the wheel; ballast cleaning elements secured to the car and extending into the wheel in the path of the uncleaned ballast discharging from said buckets whereby the cleaned ballast is directed toward the rear of said wheel; means carried by the car and disposed within the wheel below said ballast cleaning elements whereby the separated dirt is discharged beyond the ballast shoulder; and means whereby said wheel is rotated counterclockwise relative to the car travel.

7. A ballast cleaning apparatus comprising a railroad flat car provided with recesses at opposite sides; an upstanding frame secured on the car at its longitudinal center intermediate the recesses; a box-like frame arranged in each recess and linked to said upstanding frame to swing downwardly outward of the recess beyond the plane of the car-sides and above the ballast shoulder of a railroad track; a vertically disposed wheel arranged in each box-like frame provided with a plurality of ballast carrying buckets open at the outer perimeter and at the inner perimeter of the wheel so as to discharge the ballast within the wheel when the buckets approach the top of their circular orbit; rollers secured to the box-like frame and arranged in supporting relation with the inner perimeters of each wheel; rack and pinion mechanism for rotating said wheels; ballast screening elements fixedly secured in the box-like frame and disposed transversely through said wheels, said elements being arranged in downwardly sloping and rearwardly staggered relation and adapted to receive the uncleaned ballast discharging from the buckets adjacent the tops of the wheels and to direct the cleaned ballast toward the rear of the wheels onto the ballast shoulders at the sides of the track; means carried by the box-like frames and disposed within the wheels beneath said screening elements whereby the separated dirt is discharged beyond the ballast shoulder; a ballast pick-up scoop carried by each box-like frame forward of the bottom of each wheel whereby the shoulder ballast is directed into the successively passing buckets during forward travel of the car; and power operated means whereby the box-like frames and associated ele-

ments are swung into and out of operative position.

8. In a ballast cleaning apparatus, a railroad flat car; vertically rotating wheels yieldingly supported at the car sides to move vertically, each wheel consisting of a pair of ring-like plates axially spaced apart and connected by a plurality of pocket forming vanes extending to the outer perimeters of said plates and adapted to discharge at their inner ends, the sides of the wheel being each provided with an annular rack and adapted to receive a power imparting gear; a plurality of stationarily mounted rearwardly sloping elements arranged within each wheel and adapted to receive uncleaned ballast discharging from said vanes and to discharge the cleaned ballast through the rear of the wheel; means movable transversely of the wheel beneath said elements whereby the separated dirt is discharged through the side of the wheel; and means secured to the car whereby the wheels may be moved within the vertical planes of the car side or moved outwardly beyond the car sides and into contact with the ballast shoulder of a railroad track.

9. A ballast cleaning apparatus comprising a railroad flat car; a frame pivotally mounted on the car to swing outwardly beyond the car side above the shoulder ballast; a vertically rotating wheel mounted in said frame and provided with a plurality of circumferentially arranged open ended self-emptying buckets; a plurality of rearwardly sloping grizzlies secured to the frame and disposed within the wheel in the path of the ballast discharged by the buckets whereby the cleaned ballast is delivered at the rear of the wheel; dirt conveying means secured to the frame and within the wheel whereby the separated dirt is delivered laterally beyond the ballast shoulder; and a diagonally disposed blade secured to the rear end of the frame whereby the cleaned ballast is reshaped.

10. A ballast cleaning apparatus comprising a railroad flat car; a plurality of staggered discs yieldingly secured to the car whereby the ballast is plowed outwardly at the ends of the ties of the railroad track; a frame secured to the car to swing outwardly beyond the car side rearward of said discs, the forward end of the frame being provided with longitudinally disposed ballast confining side plates terminating at the rear end in a ballast pick-up scoop and ballast scarifying elements; a vertically disposed bucket wheel rotatably supported in said frame with its perimeter adjacent the pick-up scoop; a plurality of rearwardly sloping grizzlies secured to said frame and disposed within said wheel and adapted to receive the ballast discharged by the buckets of said wheel, the grizzlies being adapted to deliver the cleaned ballast to the rear of said wheel; means carried by said frame and beneath the grizzlies whereby the separated dirt is delivered laterally beyond the ballast shoulder; rotatable means secured to the frame in engagement with the inner perimeter of the wheel whereby the latter is supported and rotated; and ballast shaping means secured to the frame rearward of the wheel.

11. A ballast cleaning apparatus comprising a railroad flat car provided with recesses extending from its sides to the center sill; a gallows frame secured to the center sill intermediate the recesses at opposite sides of the car; box-like frames normally disposed in the recesses adjacent said gallows frame and linked thereto to permit the box-like frames to swing outwardly of the recesses beyond the car sides; means secured to the ends of the box-like frames and to said gallows frame whereby the positions of the former are controlled; a vertically disposed wheel in each box-like frame provided in its perimeter with a plurality of circumferentially spaced bucket forming vanes adapted to discharge through their open rear end; means intermediate the box-like frames and the inner perimeters of the wheels whereby the latter are rotatably supported and given rotation; grizzlies secured to the box-like frames, disposed within the wheels and adapted to receive the uncleaned ballast discharging from the bucket-vanes and to deliver the cleaned ballast at the rear of the wheel; dirt collecting means carried by the box-like frames and disposed through the wheels beneath said grizzlies whereby the separated dirt is delivered laterally beyond the ballast shoulder; means at the forward ends of the box-like frames whereby the shoulder ballast is scarified, scooped up and delivered to the upwardly moving buckets of said wheels; and a plurality of discs yieldingly secured to the car forward of the wheels whereby the ballast adjacent the ends of ties is plowed toward the center of the ballast shoulder.

12. A ballast cleaning apparatus comprising a railroad car; a supporting frame pivotally secured to the car to swing laterally toward the side of the car; a vertically disposed wheel rotatably supported by said frame to be positioned above the shoulder ballast at the side of a railroad track when said frame is swung outwardly, said wheel having a plurality of circumferentially spaced ballast pick-up buckets adapted to discharge within the wheel; ballast cleaning means fixedly secured to said frame and extending into said wheel so as to receive the uncleaned ballast discharging from said buckets and to direct the cleaned ballast toward the rear of the wheel; means disposed transversely through the wheel beneath said cleaning means whereby the separated dirt is discharged beyond the ballast shoulder of the track; and means whereby said wheel is rotated in a direction opposite to the travel of the car.

13. A ballast cleaning apparatus comprising a railroad car; a vertically rotating wheel secured to the car so as to be positioned at the car side above the shoulder ballast of the track, said wheel at its perimeter having a plurality of ballast pick-up buckets adapted to discharge their contents within the wheel; a plurality of rearwardly and downwardly sloping vibratile elements immovably mounted within the wheel and adapted to receive the uncleaned ballast discharging from said buckets when the latter approach the top of the wheel and to discharge the cleaned ballast on the ballast shoulder at the side of the track; means movable transversely within the wheel beneath said elements whereby the dirt separated by the vibratile elements is discharged through the side of the wheel beyond the ballast shoulder; and means whereby said wheel is actuated.

14. A ballast cleaning apparatus comprising a railroad flat car; a vertically disposed frame pivotally secured at the car side to swing outwardly above the shoulder ballast; a vertically rotating wheel mounted in the frame and provided with a plurality of open ended buckets adapted to discharge the picked-up ballast into the wheel when they approach the top of the

wheel; a plurality of rearwardly sloping ballast cleaning elements mounted in the frame and disposed transversely within the wheel whereby the cleaned ballast is directed through the rear of the wheel onto the ballast shoulder; means disposed transversely through the wheel and beneath said cleaning elements whereby the separated dirt is delivered outwardly beyond the ballast shoulder; means secured at the bottom of said frame forward of said wheel whereby the ballast is scarified and directed into the upwardly moving buckets of said wheel; means secured to said frame rearward of the wheel for shaping the cleaned ballast; and power operated mechanism mounted on the car for controlling said frame and rotating said wheel.

TOM ARTHUR BLAIR.