July 6, 1943. H. W. MEESE 2,323,343

RAILROAD BALLAST RESHAPER AND SUB GRADE CLEANER

Filed Oct. 29, 1941 6 Sheets-Sheet 1

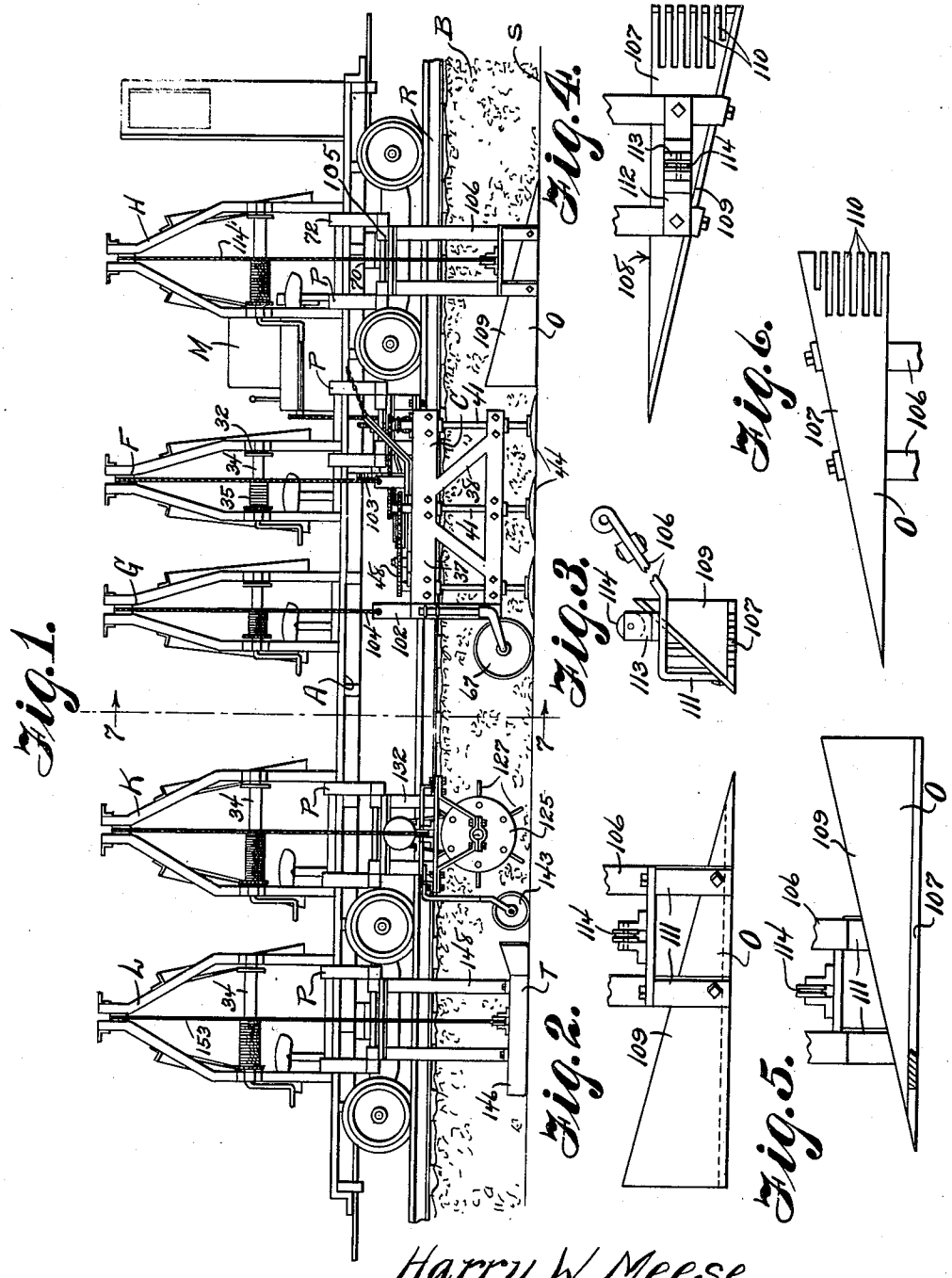


Fig. 1.

Fig. 4.

Fig. 6.

Fig. 3.

Fig. 2.

Fig. 5.

Harry W. Meese INVENTOR

BY Victor J. Evans & Co.

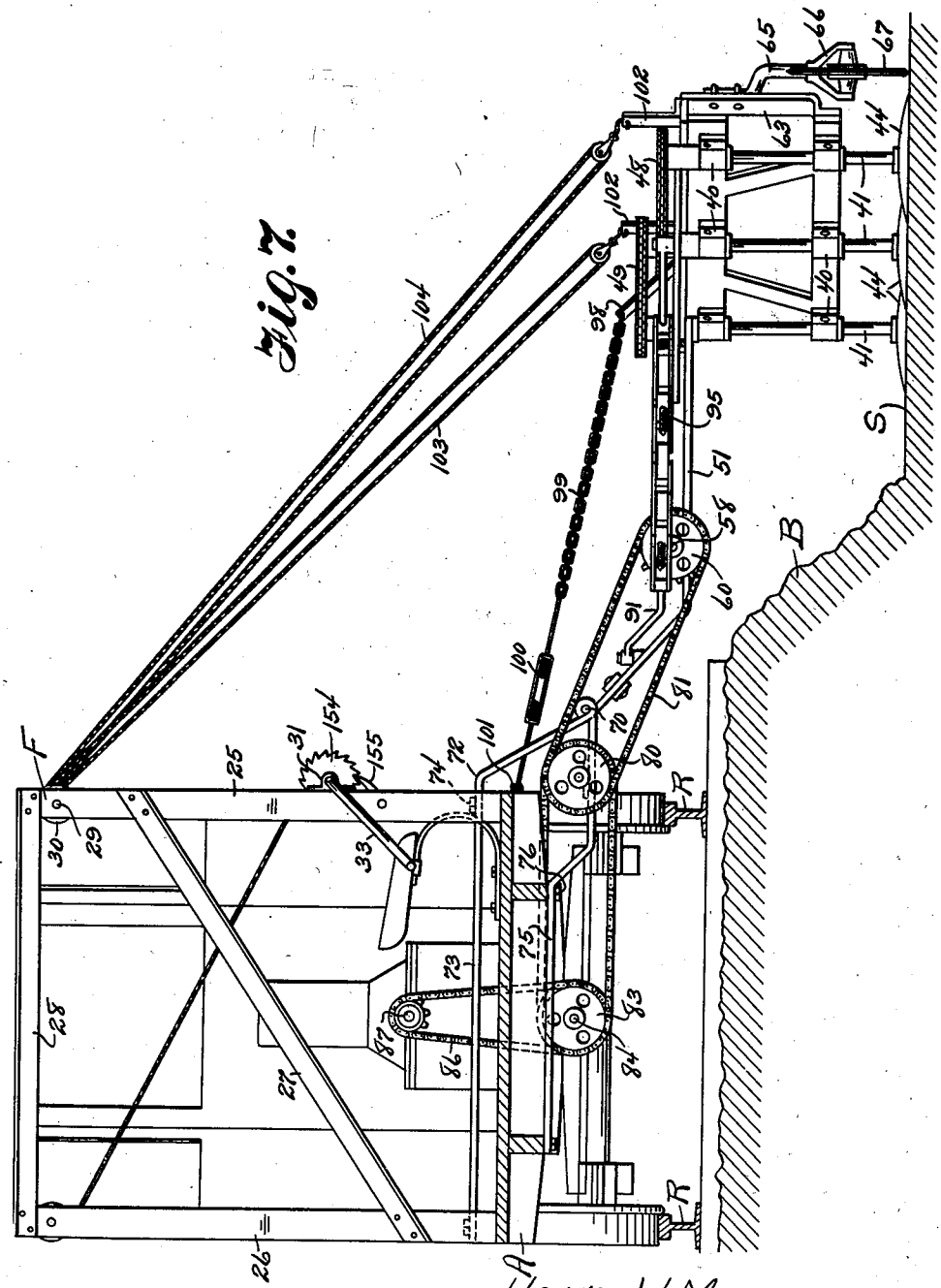
ATTORNEYS

July 6, 1943. H. W. MEESE 2,323,343

RAILROAD BALLAST RESHAPER AND SUB GRADE CLEANER

Filed Oct. 29, 1941 6 Sheets-Sheet 2

Fig. 2.



Harry W. Meese INVENTOR

BY Victor J. Evans & Co.

ATTORNEYS

July 6, 1943. H. W. MEESE 2,323,343

RAILROAD BALLAST RESHAPER AND SUB GRADE CLEANER

Filed Oct. 29, 1941 6 Sheets-Sheet 3

Fig. 8.

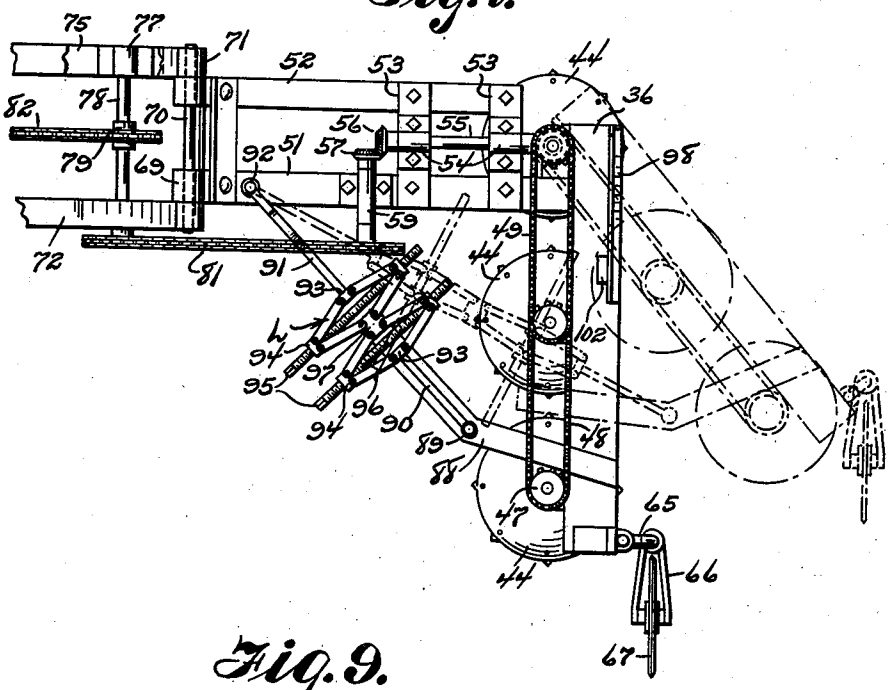
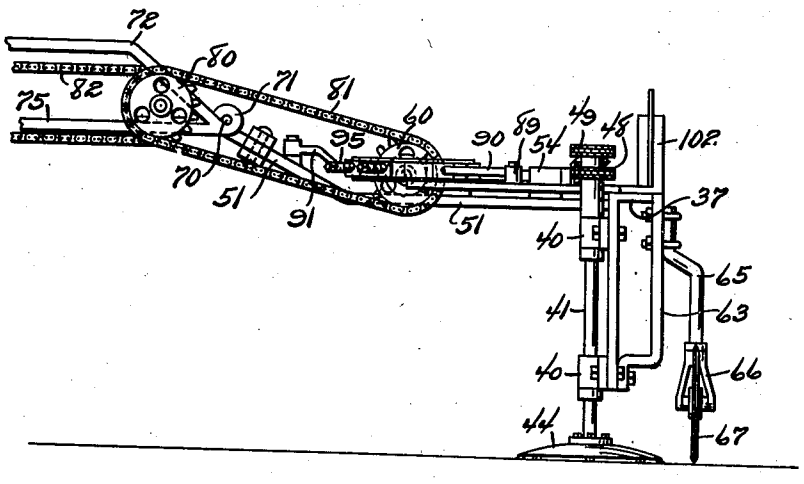


Fig. 9.



Harry W. Meese

INVENTOR

BY Victor J. Evans & Co.

ATTORNEYS

July 6, 1943. H. W. MEESE 2,323,343

RAILROAD BALLAST RESHAPER AND SUB GRADE CLEANER

Filed Oct. 29, 1941 6 Sheets-Sheet 4

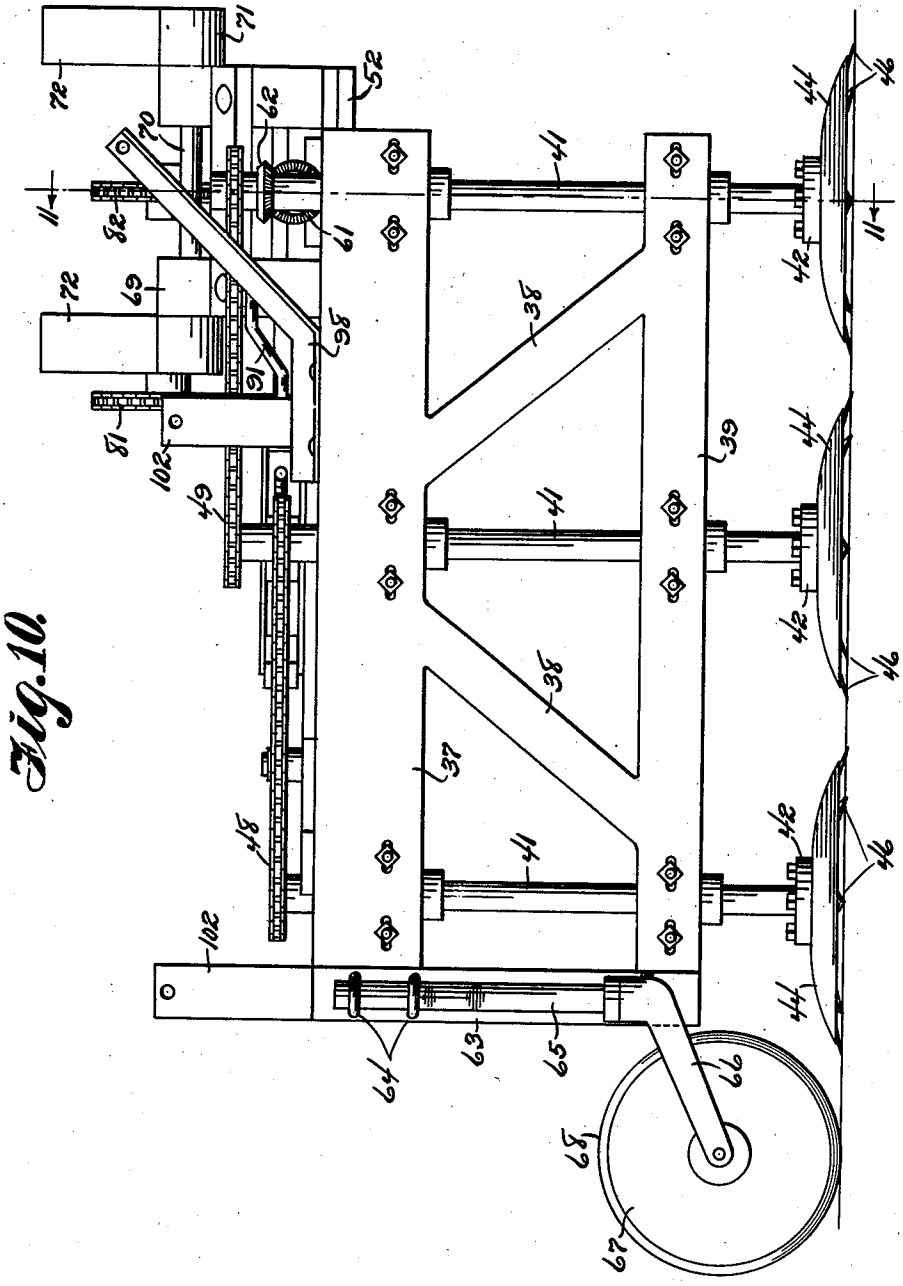


Fig. 10.

Harry W. Meese INVENTOR

BY Victor J. Evans & Co.

ATTORNEYS

July 6, 1943. H. W. MEESE 2,323,343

RAILROAD BALLAST RESHAPER AND SUB GRADE CLEANER

Filed Oct. 29, 1941 6 Sheets-Sheet 5

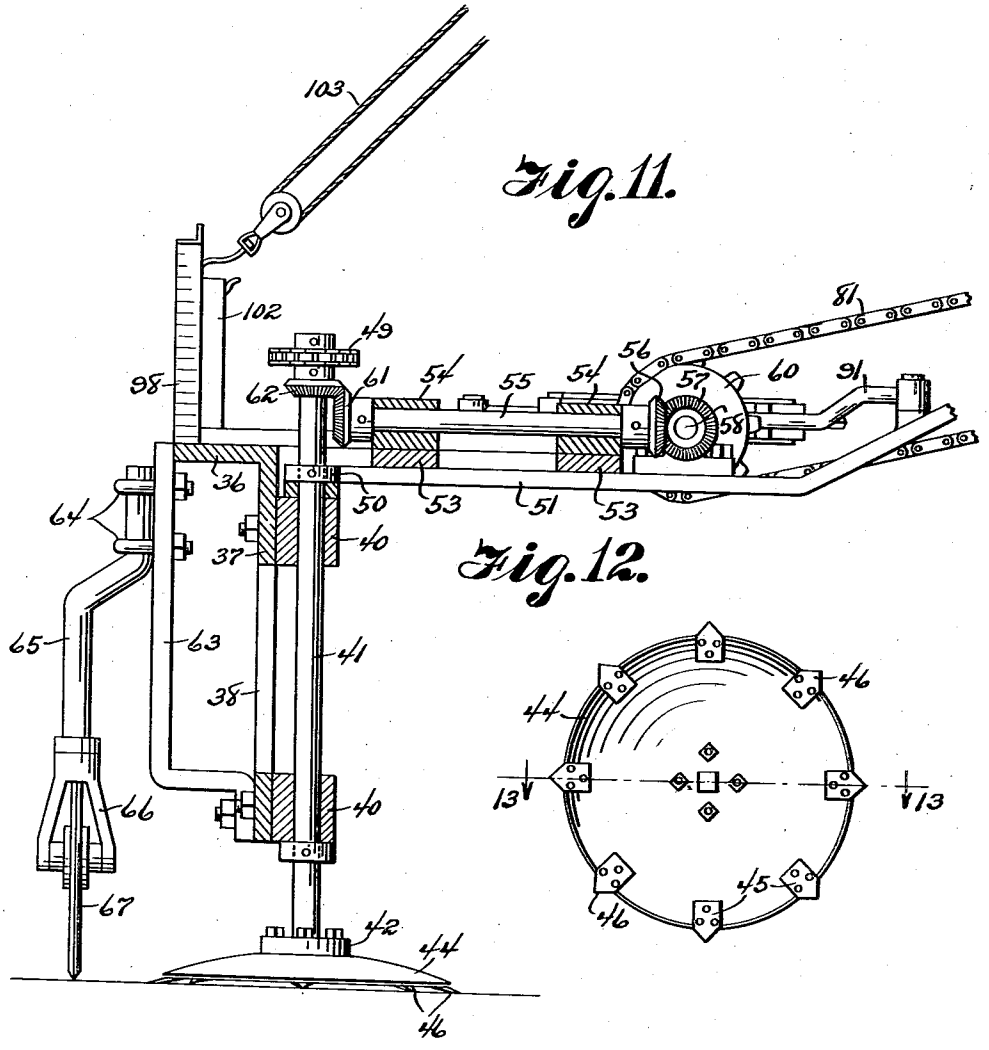
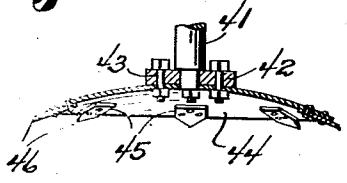


Fig. 11.

Fig. 12.

Fig. 13.



Harry W. Meese
INVENTOR

Victor J. Evans & Co.
ATTORNEYS

July 6, 1943. H. W. MEESE 2,323,343

RAILROAD BALLAST RESHAPER AND SUB GRADE CLEANER

Filed Oct. 29, 1941 6 Sheets-Sheet 6

Fig. 14.

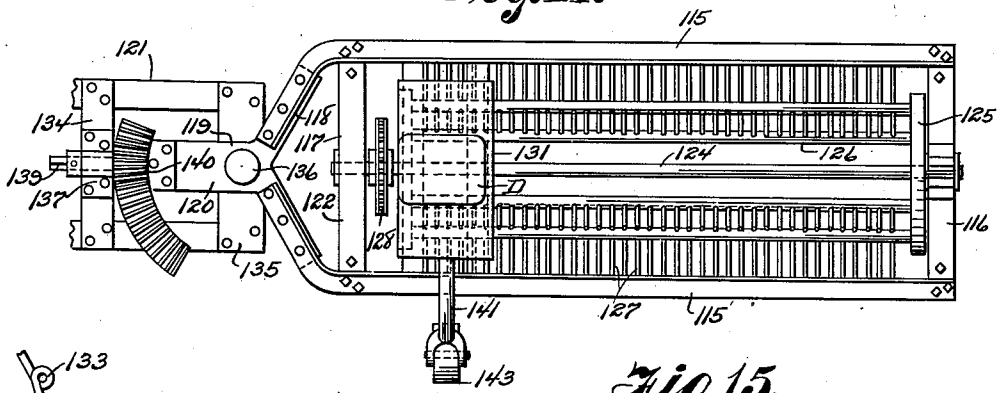


Fig. 15.

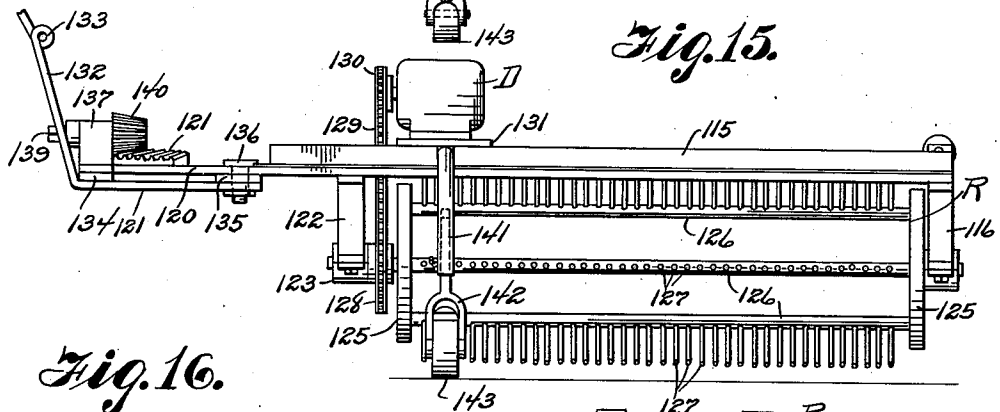


Fig. 16.

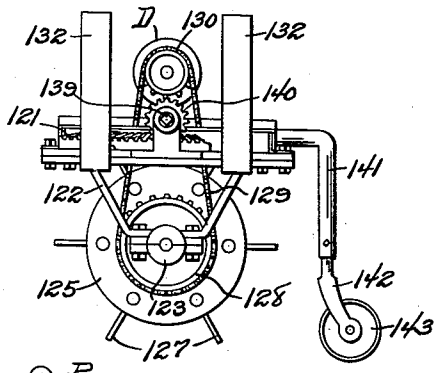


Fig. 17.

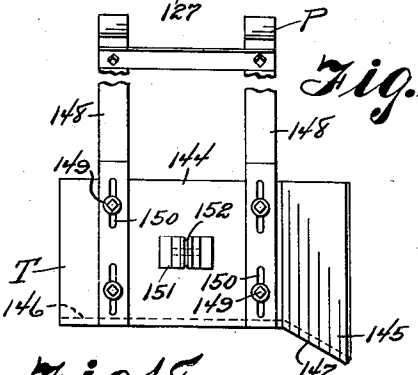


Fig. 18.

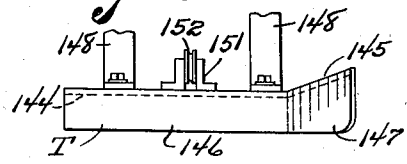
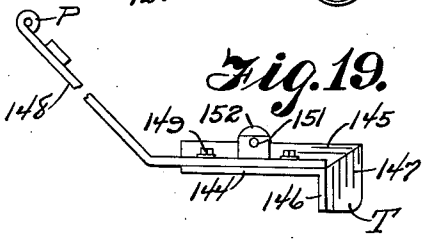


Fig. 19.



Harry W. Meese INVENTOR

BY Victor J. Evans & Co.

ATTORNEYS

Patented July 6, 1943 2,323,343

UNITED STATES PATENT OFFICE

2,323,343

RAILROAD BALLAST RESHAPER AND SUBGRADE CLEANER

Harry W. Meese, Meadville, Pa.

Application October 29, 1941, Serial No. 417,030

6 Claims. (Cl. 37—105)

The present invention relates to new and useful improvements in roadway shaping and trimming apparatus particularly adapted for reshaping the ballast and removing growth from the shoulder of railroad roadways and right of ways.

An important object of the invention is to provide roadway shaping and trimming apparatus of generally improved construction.

Another object of the invention is the provision of shaping and trimming apparatus which is highly efficient for removing shoulder vegetation and ballast reshaping.

A further object of the invention is to provide apparatus of the above character which is designed to reduce the time and cost required for maintaining railroad roadways in proper condition.

Still another object of the invention is the provision of apparatus of the above character constructed so as to enable rapid and conventional elevation of the roadway treating means from an operative to an inoperative position for clearing obstructions along the right of way.

Other objects and advantages of the invention will become apparent as the description progresses.

In the acompanying drawings forming a part of this specification and in which like numerals are employed to designate corresponding parts throughout;

Figure 1 is a side elevational view of the assembled apparatus,

Figure 2 is a fragmentary side elevational view illustrating the gathering device thereof,

Figure 3 is an end view of the same,

Figure 4 is a top plan view of the same,

Figure 5 is a side elevation looking from the inner side of the same,

Figure 6 is a bottom plan view of the same,

Figure 7 is an enlarged transverse section taken on line 7—7 of Figure 1,

Figure 8 is a top plan view of the cutting device,

Figure 9 is a rear end elevational view of the same,

Figure 10 is a side elevational view of the same as viewed from the outer side thereof,

Figure 11 is a transverse section taken on line 11—11 of Figure 10,

Figure 12 is a bottom plan view of one of the cutting members,

Figure 13 is a transverse section taken on line 13—13 of Figure 12,

Figure 14 is a top plan view of the raking device,

Figure 15 is a rear elevational view of the same,

Figure 16 is an end elevational view of the same,

Figure 17 is a top plan view of a shaping device,

Figure 18 is a side elevational view of the same as viewed from the exterior of the apparatus, and

Figure 19 is a rear view of the same as viewed from the rear end of the apparatus.

Referring in detail to the drawings, wherein for the purpose of illustration is shown a preferred example of the invention, A generally designates a carrier, in the present instance in the form of a wheeled flat car driven by or carrying a motor M and adapted for movement along the rails R mounted on the ties of a roadway which may comprise a ballast bed B sloping downward to a subgrade mud shoulder S forming part of the right of way.

On the platform of the car A is mounted, rearwardly of the motor M, an upstanding hoist frame F embodying a pair of end angle bars 25 secured in spaced relation along one margin of the car platform and shaped so that their upper ends converge. A similar pair of bars 26 forms the opposite end of the frame in spaced relation on the opposed side margin of the platform. A pair of inclined angle bars 27 connect the transversely opposed bars at each side of the frame to brace the same while horizontal bars 28 connect the upper ends of the upright bars 25 and 26. In the upper part of the complementary front end frame bars 26 is journalled a tranversely arranged gudgeon 29 supporting on its intermediate portion a rotary pulley wheel 30. At lower portions on the bars 25 are fastened bearing brackets 31 in which is journalled a transversely extending shaft 32 prolonged at one end and bent to form an angular hand crank 33. On the shaft 32 is secured a winding drum 34 having attached thereto one end of a cable 35 trained over the pulley and having its outer end directed laterally of the car.

A similar frame G is mounted adjacent to and rearwardly of the aforementioned frame to act in concert therewith. These frames are operative to support and swing a cutter device C.

The cutter C embodies a frame section which may be shaped from a plate forming a longitudinal top flange 36 adjacent a depending side flange 37 from which are extended inclined bars 38 joining a lower longitudinal bar 39. To the inner sides of the flange 37 and lower bar 39 are connected bearings 40 having journalled therein a plurality of; in the present instance three,

vertically disposed shafts 41 disposed at uniformly spaced longitudinal positions.

To a flange 42 secured at the lower end of each of the shafts 41 is fastened, by bolts 43, the center apertured portion of a disk 44 which is dished so that the bottom is concaved. To the marginal portion of the disk are secured, by rivets or the like, a plurality of cutting elements 45 embodying elongated metallic pieces provided with pointed cutting ends 46 which project radially from the peripheral edge of the disk. These cutting elements are advantageously disposed at uniformly spaced circumferential positions to form a toothed cutting member. On the upper ends of the shafts 41 are secured sprocket wheels 47, an endless chain 48 connecting the sprocket of the outermost shaft with that of the intermediate shaft while an endless chain 49 is trained to connect a second sprocket on the latter shaft with a complementary sprocket on the innermost shaft. This chain and sprocket structure joins the shafts for simultaneous rotation.

An end shaft of this set is extended through an apertured element 50 forming a pivot eye attached to the projecting end of a bar 51 arranged parallel with a bar 52 and connected therewith by cross bars 53 to provide an extension frame section. In bearings 54 secured on the cross bars 53 is journalled a shaft 55 having a bevel gear 56 on one end in mesh with a bevel gear 57 secured on a right angularly disposed shaft 58 journalled in a bearing 59 secured on the bar 51. On the opposite end of the shaft 58 is secured a sprocket wheel 60. On the outer end of the shaft 55 is secured a bevel gear 61 disposed to mesh with a complementary bevel gear 62 fixed on the upper end of a cutter shaft 41 at the inner end of the cutter frame. To the outer end of the cutter frame is secured a vertically disposed angular bar 63 disposed against the flange 36 and the bar 39 and having a pair of spaced U bolts 64 attached to its upper portion. These U bolts serve to connect to the bar 63 the upper portion of an offset vertically disposed rod 65 having attached for swivel movement to its lower end, the socket of a fork 66 carrying a gudgeon in the end portion on which is rotatably mounted a wheel 67 having the periphery beveled to form a relatively sharp edge 68. Inner end portions of the bars 51 and 52 are bent to assume upwardly directed angles and terminate in eye forming loops 69 disposed to embrace transversely spaced portions of the pivot pin 70.

The ends of this pin are engaged by the outer looped ends 71 of a pair of transversely disposed bars 72 of a support structure P, these bars being shaped so that their outer portions assume an upward inclination from the loops while the major lengths thereof, indicated 73, extend transversely over the top of the car platform and are secured thereon by studs 74. These straight lengths of the bars 72 may advantageously be provided with longitudinal slots for the reception of the studs to enable lateral adjustment of the bars with reference to the platform. The angular bars 72 are reinforced by parallel bars 75 having their inner ends welded or otherwise secured to the looped end portions 71 and disposed to extend transversely of the bottom of the car to which they are likewise connected by studs 76 extending through slots in the bars. In bearings 77 fastened on the bars 75 is journalled a transversely disposed shaft 78 having a sprocket wheel 79 secured on its intermediate portion and a second sprocket wheel 80 fixed on a projecting end portion thereof. An endless chain 81 connects the sprocket 80 with the sprocket 60. A chain 82 connects the sprocket 79 with a sprocket 83 secured on a shaft 84 rotatably supported in horizontal position below the car platform and having a second sprocket 85 fixed thereon. Over this latter sprocket is trained the lower portion of a chain 86 connecting with a sprocket 87 fixed on the drive shaft of the motor M.

To an angular arm 88 fastened on the main cutter frame section is connected, by a pivot 89, the outer end of a rod section 90 complemental to a rod section 91 fastened to the extension frame bar 51 by a pivot 92. The inner ends of these rod sections connect with head elements 93 forming parts of a pair of toggle link connections L, shown to an advantage at Figure 8. Each of these connections may embody collars 94 threadedly engaging the opposed right and left hand thread sections of a screw element 95 and having two pair of oppositely directed links 96 disposed so that their outer ends are pivotally joined to the collars and their inner ends to a head 93 at one side and a connecting plate 97 at the opposite side. Upon rotation of either or both of the screw swings 95, as through the instrumentality of a socket wrench or the like, the head 93 to which the rod sections are connected may be separated or contracted to lengthen or shorten the longitudinal dimension of these sections for selectively adjusting the angular relation of the cutter carrying main frame with reference to the extension frame section formed by the bars 51 and 52. On the inner end of the frame top 36 is fastened an angular bar 98 having attached to its elevated end a chain 99 connected, through the medium of a turn buckle 100, with an eye 101 fastened to the side of the car platform. To a pair of brackets 102 secured on the frame plate 36 are connected cables 103 and 104 trained over the elevated pulleys 30 of the hoist frames F and G respectively, and attached to the winding drums 34 thereof for elevating the cutter frame assembly about the axis of the pivot 70.

On the forward portion of the car A is mounted a hoist apparatus H, similar to the hoist F, to be employed in conjunction with a gathering device generally indicated at O. This device is attached to the car through the medium of a support structure P corresponding to that connecting the cutting device with the car embodying the parallel upper bars 72 and the parallel lower bars 75 mounted transversely on the car platform and supporting, laterally thereof, a pivot shaft 70. To this shaft are connected the inner looped ends 105 of a pair of parallel bars 106 attached to an elongated tapered gathering member O. This member may be formed from an elongated metallic plate bent at right angles on a diagonal line to form a triangular shaped bottom 107 having a straight longitudinal edge 108 and an opposite edge disposed at an acute angle thereto. At this latter edge is formed a flange 109 having an increasing taper from its forward end to its rear end. At the front the bottom 107 is provided with a plurality of longitudinally extending slots 110 defining teeth therebetween bevelled at their forward ends. At their outer ends the attaching bars 106 are formed to provide depending portions 111 bolted or otherwise attached to the exterior of the flange 109. On

horizontal portions of the bars 106 is mounted a cross bar 112 carrying brackets 113 holding a gudgeon for a vertically disposed roller 114. A cable 114' trained over the roller 30 and attached to the drum of the hoist H is fastened about the roller 114 for vertically swinging the gathering device O from its normally operative downward position to an elevated inoperative position.

On the rearward portion of the car is mounted a hoist K similar to the hoist apparatus H having disposed, at the foot thereof, a laterally projecting support structure P. These structures are adapted for connection with a raking device R composed of an elongated frame normally disposed in an approximately horizontal plane embodying longitudinal side bars 115 having fastened to their end portions a pair of transverse frame bars 116 and 117. The inner ends of the bars 115 are bent to converge and are fastened to the diverging arms 118 of the Y-fitting 119, the elongated body plate 120 of which extends inwardly of the frame. On the outer portion of the plate 120 is secured an arcuate toothed rack 121 having upwardly disposed bevelled teeth forming a segmental gear. At the bottom ends of a pair of arms 122 depending from the end bars 116 and 117 of the frame are provided bearings 123 in which are journalled the ends of a longitudinally disposed shaft 124. On this shaft are secured a pair of longitudinally spaced disks 125 having attached thereto and extending axially therebetween, a plurality of rods 126 arranged at angularly spaced positions along the margins of the disks. In apertures formed at longitudinally spaced intervals in the rods 126 are fitted the inner ends of a plurality of pins 127 projecting radially from the rods to provide rows of rake teeth. On an end of the shaft 124 is secured a sprocket wheel 128 having trained thereover a drive chain 129 which connects with a sprocket 130 fixed on the shaft of a drive motor D. This motor is firmly mounted on a bed plate 131 secured transversely on side bars 115 of the raking frame for rotating the raking reel.

The inner protruding portion of the raking frame connects with an extension frame composed of a pair of transversely spaced parallel bars 132 of angular form, the inner upwardly directed ends of which are looped to form pivot knuckles 133 designed to embrace the pivot shaft 70 of the support P mounted on the car at the foot of the hoist K. The outer horizontal extensions of the bars 132 carry a pair of transverse brace bars 134 and 135, the latter having a central opening registering with an opening in the Y-fitting 119 and through which is extended a pivot stud 136 pivotally connecting the rake frame to the extension. On the cross bar 134 is secured a bearing 137 in which is journalled a stub shaft 138 having a protruding non-circular extension 139 at its inner end. On the outer end of this stub shaft is secured a bevel pinion 140 disposed to mesh with the segment gear 121. It will be observed that the stub shaft 138 may be detachably connected with an extension shaft operable manually or by motor power to operate the gear and turn the raking frame about the axis of the pivot 136. To one side of the raking frame is connected an angular bracket element 141 provided with a socket in its lower depending portion for receiving therein the upwardly projected shank of a caster wheel yoke 142 carrying a rotary flat rimmed wheel 143 for regulating the height of the rake teeth 127 above the ground.

Another hoist L disposed rearwardly of and similar to the hoist structure K cooperates with a shaping device generally indicated at T connected to the car through the medium of a support P as hereinbefore described. This device embodies a metallic plate shaped to form an elongated essentially rectangular top wall 144 having a tapered lateral projection 145 at the outer side of its front portion. At one edge of this wall is formed a vertically depending flange 146 merging into an outwardly directed front flange extension 147. The forward portion of the top wall 144 is bent to assume an upward inclination and the front extension of the side flange is tapered accordingly, forming an enlarged upwardly and laterally flaring mouth structure. The top wall of this angular device is adjustably connected to a pair of extension bars 148 by nut-engaging studs 149 which extend through longitudinally directed slots 150 in the bars. The inner ends of the bars 148 are looped to form bearing knuckles embracing the transverse pivot element 70 of the shaper connecting support frame P. Between angular bracket sections 151 fastened on the top of the shaper body T is provided a roller 152 adapted for engagement with the outer end of a cable 153 of the hoist L.

During operation of the apparatus the four devices comprising the assemblage are disposed in their normal downward positions and the car moved along the rails. The initial roadside treating member, that is the gathering device O, is moved along the ground so that the front toothed portion scrapes up the scattered particles of ballast and sweeps the same inwardly to a roughly straight edge at the margin of the ballast bed. The cutter device C following the gathering device is utilized to cut the growth, such as weeds and other vegetation, upon the sub grade shoulder of the roadway or right of way from the edge of the ballast bed outwardly. Thus, if the device is to cut the growth along a relatively narrow strip of the ground at the side of the ballast bed, the outer main section of the cutter frame is disposed parallel with the rails and at right angles to the extension frame section, as shown at Figure 8, wherein it cuts a strip corresponding to the diameter of the cutters. If it is desired to cut the vegetation along a wider strip of the shoulder, the cutter carrying frame section is swung outwardly through operation of the screws 95 to expand the link mechanism and turn the frame so that its rearward portion projects laterally of its inner portion with the frame at an obtuse angle with the extension section, as shown in dotted lines at Figure 8. This enables regulation of the width of the strip from which the vegetation is cut by the heads of the cutter device. The wheel 67 of the cutter mechanism is rolled vertically to cut the vegetation at the outer edge of the trimmed strip so as to provide a sharp cutting line along the outer edge of this strip. The rotary raking device R following the cutter is designed to throw the cut vegetation from the cut strip of the shoulder and, with this in mind, the raker frame is turned from the transversely extending positions shown at Figures 1 and 14, to an angular position in accordance with the width of the cut on the shoulder so as to rake the cut growth outwardly of the cleared strip. The shaper device at the rear end of the car is moved so as to pack the loosely gathered ballast at the edge of the ballast bed into a compact sharply de-

fined edge formation. In this manner, the roadway is efficiently trimmed and reshaped at a relatively rapid rate of movement so that the sides of the roadway may be maintained in safe, proper condition at a minimum of expense.

In addition to providing vertically adjustable supports for the devices of the apparatus, the hoist frames connected therewith through cables, in conjunction with the laterally projecting support frame structures pivotally connected with the respective devices, enable vertical elevation of the latter to upwardly directed positions for clearing bridges, culverts and various obstructions with a minimum of delay. These hoists are designed so that the respective devices of the apparatus may be swung upward to inoperative clearing position individually or simultaneously through operation of the winding drums thereof. In order that the hoists may be releasably locked to hold the device at a selected elevation, the drums thereof are advantageously equipped with ratchet wheels **154** in coacting relation with pawls **155** pivotally mounted on the hoist frame.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In ballast bed shaping apparatus an elongated member having a top plate and a depending flange at one longitudinal edge thereof, an upwardly inclined extension at the forward end of the top plate, and an outwardly directed angular extension at the forward end of the flange, said flange and top extension merging to form a flaring mouth portion.

2. In ballast bed shaping apparatus an elongated member having a top plate and a depending flange at one longitudinal edge thereof, an upwardly inclined extension at the forward end of the top plate, an outwardly directed angular extension at the forward end of the flange, said flange and top extension merging to form a flaring mouth portion, and means for mounting the said member in position for packing ballast at the edge of a ballast bed.

3. In ballast dressing apparatus, a carrier, means supported on the carrier for gathering scattered ballast toward the ballast bed, means mounted on the carrier operative to cut plant growth along the path cleared by the gathering means, and means mounted on the carrier rearwardly of the cutter for firmly packing the outer edge of the ballast bed.

4. In ballast dressing apparatus, a carrier, means supported on the carrier for gathering scattered ballast toward the ballast bed, means mounted on the carrier operative to cut plant growth along the path cleared by the gathering means, means mounted on the carrier rearwardly of the cutter for firmly packing the outer edge of the ballast bed, and hoist means on the carrier operative to maintain the said gathering, cutting and packing means in selected operative positions and to elevate the said means to inoperative obstacle clearing positions.

5. In ballast dressing apparatus, a wheeled car, a gathering support extending laterally from the car, a member attached to the support operative to gather scattered ballast outwardly of the ballast bed and to dispose the same along the outer edge of the bed, a cutter support projecting laterally from the car rearwardly of the gathering support, cutters operatively mounted on the cutter support disposed to cut plant growth along the path cleared by the gathering device, a raking device supported on and disposed laterally of the car for raking the severed growth behind the cutter, a support extending laterally from the car rearwardly of the raking device, and a packing member attached to the said last mentioned support operative to firmly pack the outer edge of the ballast bed.

6. In ballast dressing apparatus, a wheeled car, a gathering support extending laterally from the car, a member attached to the support operative to gather scattered ballast outwardly of the ballast bed and to dispose the same along the outer edge of the bed, a cutter support projecting laterally from the car rearwardly of the gathering support, cutters operatively mounted on the cutter support disposed to cut plant growth along the path cleared by the gathering device, a raking device supported on and disposed transversely of the car for raking the severed growth behind the cutter, a support extending laterally from the car rearwardly of the raking device, a packing member attached to the said last mentioned support operative to firmly pack the outer edge of the ballast bed, and hoist means mounted on the car having connection with the respective gathering, cutting, raking and packing devices operative to support the said devices in selected operative positions and to independently elevate the same to inoperative obstacles clearing positions.

HARRY W. MEESE.