Dec. 15, 1942. E. E. FRAUENHEIM, JR 2,305,381

CAR UNLOADING APPARATUS

Filed May 29, 1941 4 Sheets-Sheet 1

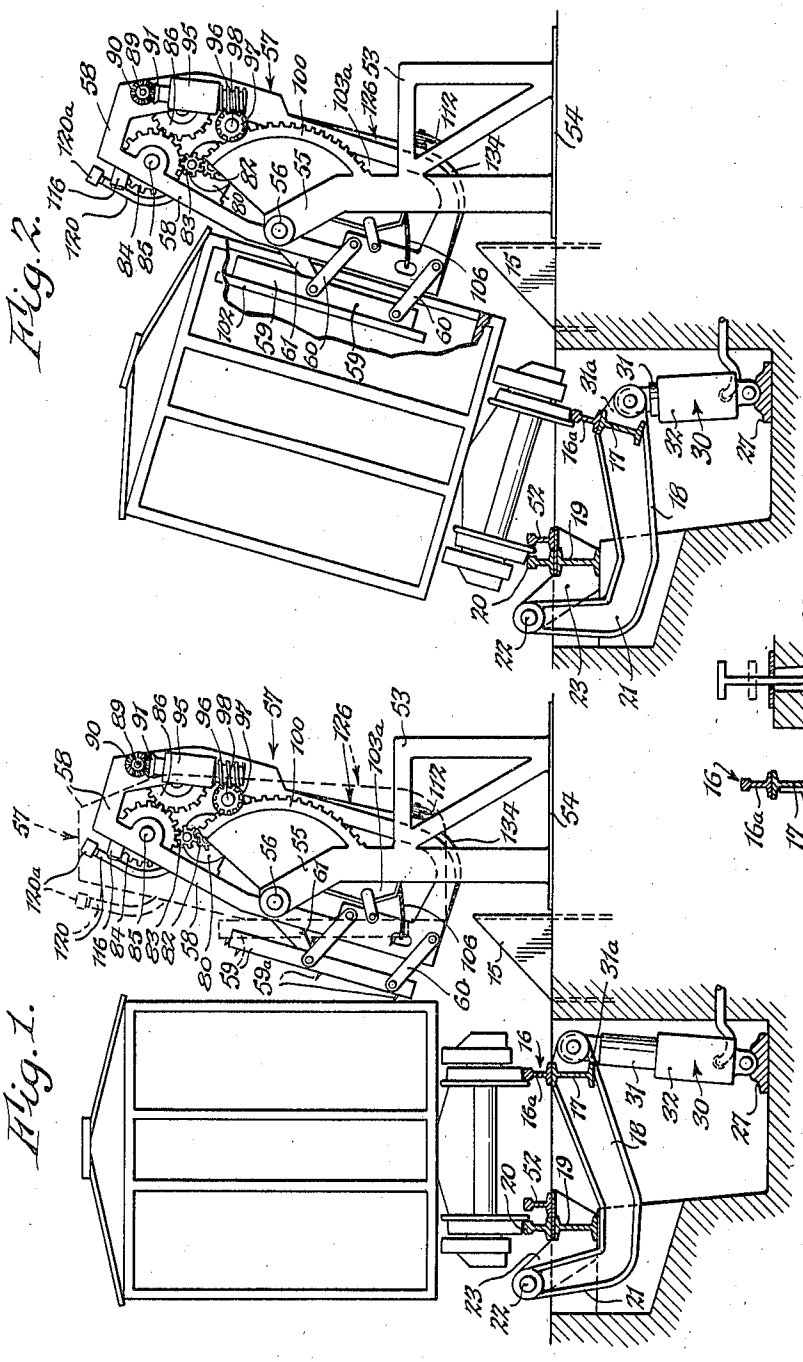


Fig. 2.

Fig. 1.

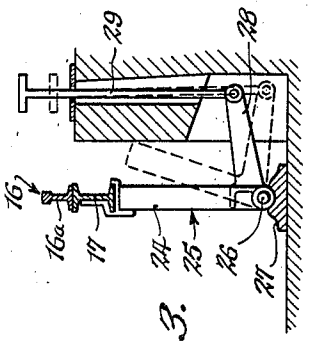


Fig. 3.

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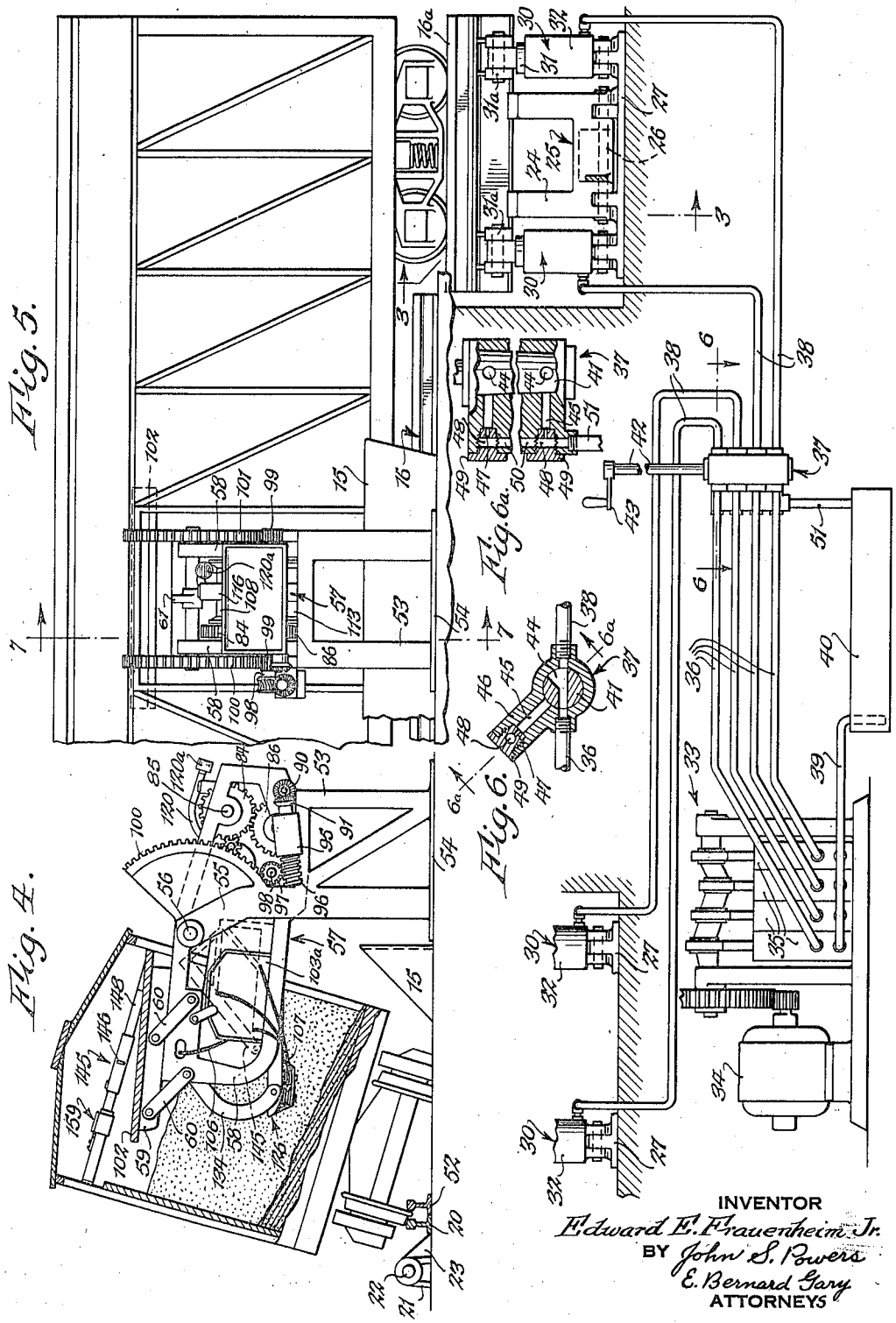


Fig. 5.

Fig. 6a.

Fig. 6.

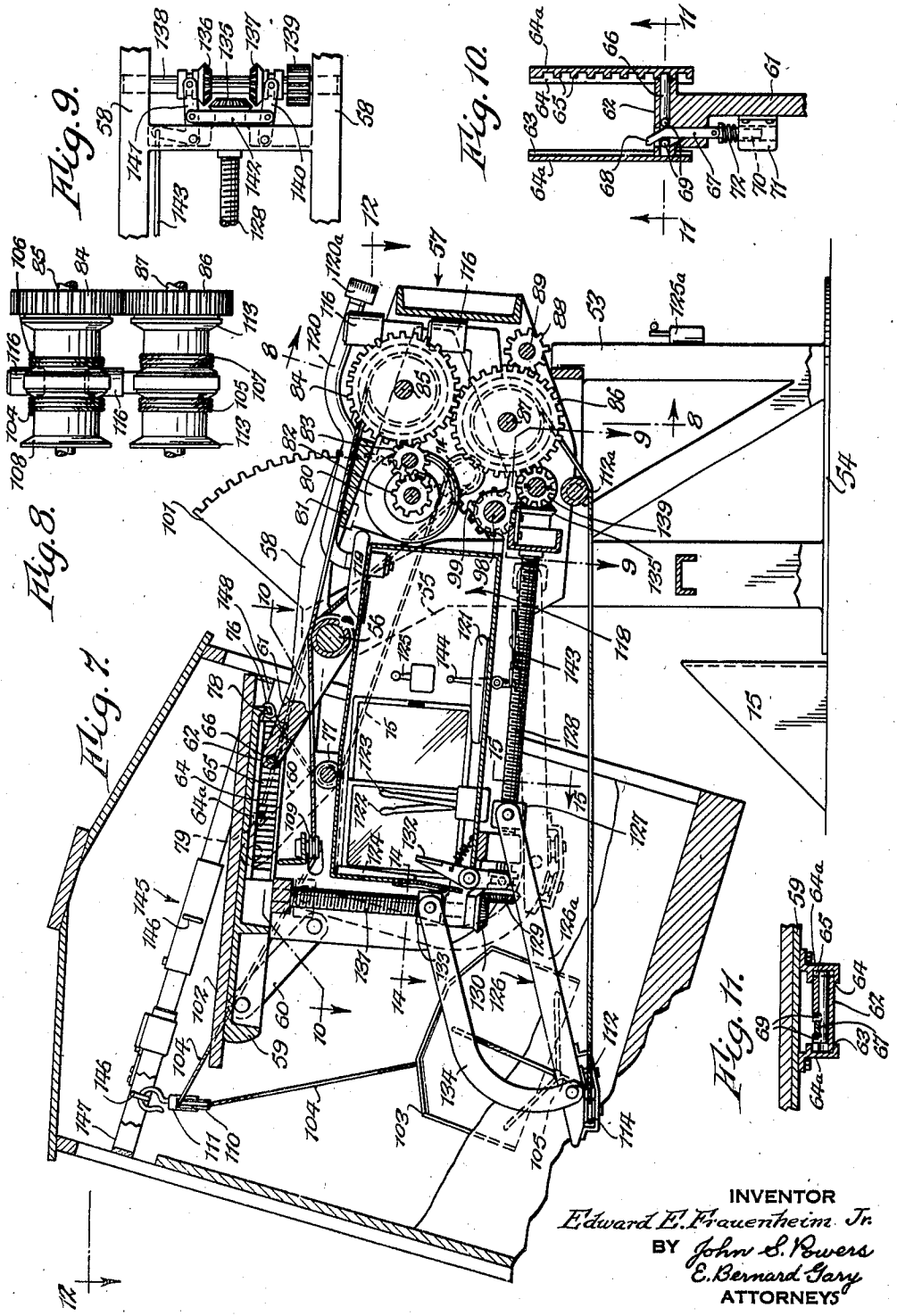
Fig. 4.

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Filed May 29, 1941 4 Sheets-Sheet 4

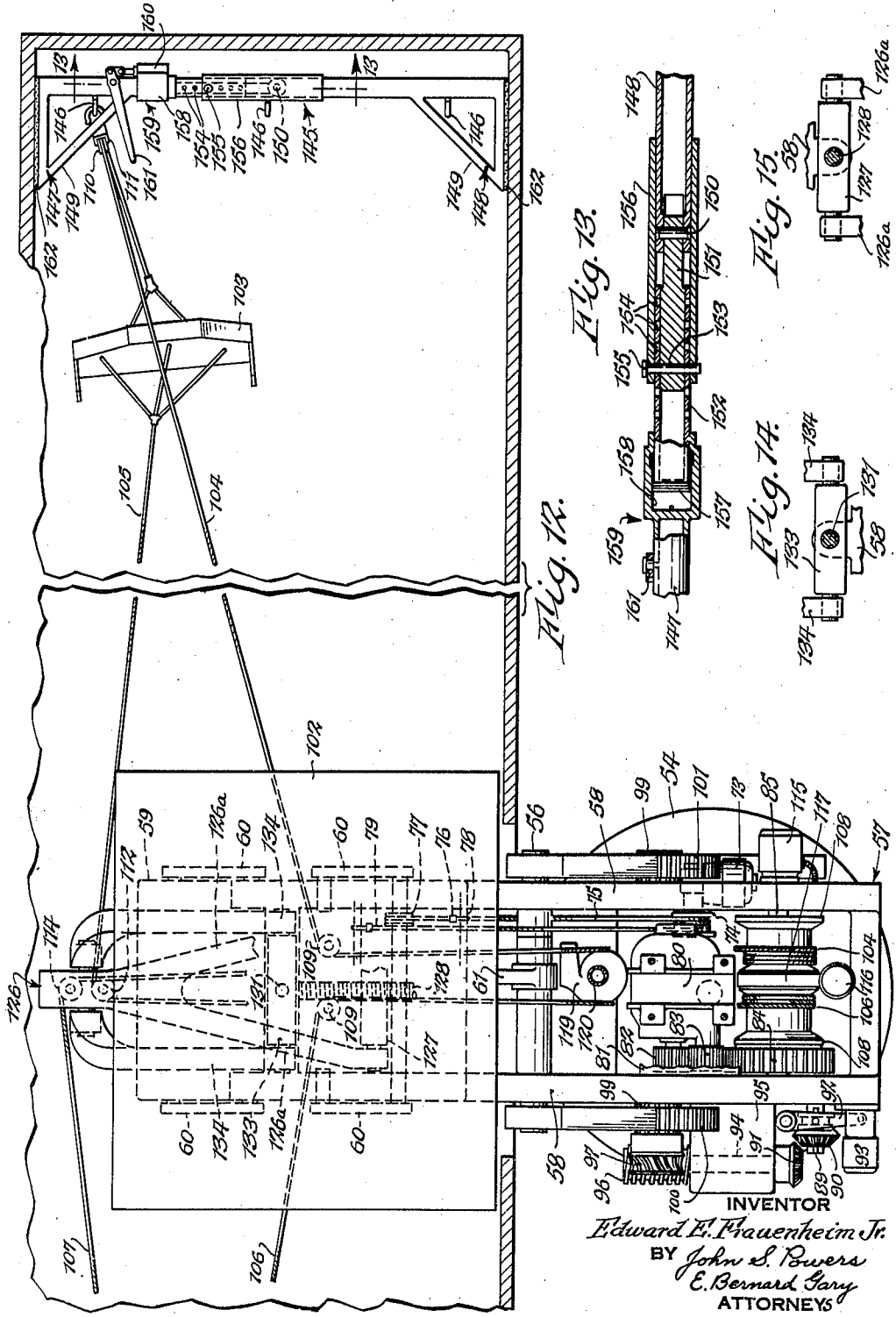


Fig. 13.

Fig. 15.

Fig. 14.

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UNITED STATES PATENT OFFICE

2,305,381

CAR UNLOADING APPARATUS

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Application May 29, 1941, Serial No. 395,777

14 Claims. (Cl. 214—54)

This invention relates to improvements in apparatus for unloading bulk materials from box cars and, although not necessarily limited to such use, is characterized by features which render it of particular utility in connection with the unloading of cars of the kind having doors provided by cooperage which is nailed or otherwise secured in place and which can be removed in conventional manner only in a slow and arduous operation.

One object of the invention is to provide for facility and speed, with a minimum of labor, in the unloading of a car of the type generally described, the carrying out of this object involving the lowering of the side of the car having the door to be broken in to thereby enable the weight of the car to be utilized in this operation and to facilitate discharge of the material from the car.

A further object is to provide apparatus which requires only one operator, which is simple and compact in design and which has a low power consumption.

A still further object is apparatus wherein provision is made for protecting the operator from the dust which rises from the material being unloaded and for accommodating him within the car in such a position that he can observe the operation of the shovels and manipulate them as desired.

A still further object is to provide apparatus which is available to break in the door of a car rapidly and without damage to the cooperage, this object contemplating apparatus which is so designed that during, and as an incident to, the breaking-in operation the cooperage will be elevated to an out-of-the-way position in the top of the car while the shovels, pulley blocks, cables and spreaders will be simultaneously introduced into the car so as to be conveniently accessible to the operator.

A still further object is to provide apparatus which is available for the unloading of various materials from cars of various sizes and having various doorway dimensions, which may be readily adapted to existing track and receiving pit facilities and which, in the event such facilities include double tracks, is available for the servicing of both tracks.

The invention is illustrated in the accompanying drawings in which:

Figure 1 is a view, partially in elevation and partially in section, of apparatus embodying the features of the invention, the carriage for breaking in the cooperage being rocked to its initial position with respect to the doorway of a car.

Figure 2 is a similar view showing the carriage in the same position and illustrating the manner in which it is caused to enter the doorway to break in the cooperage when the adjacent side of the car is lowered.

Figure 3 is an enlarged detail section taken along line 3—3 of Figure 5.

Figure 4 is a view, partially in elevation and partially in section, showing the carriage rocked to the position in which it supports the cooperage in the top of the car.

Figure 5 is a side elevational view of one end of the car, the parts occupying the positions shown in Figure 4, and illustrates the hydraulic system employed for lowering one side of the car and for restoring the car to its original position upon completion of the unloading operations.

Figure 6 is an enlarged detail sectional view taken along line 6—6 of Figure 5.

Figure 6a is a similar view taken along line 6a—6a of Figure 6.

Figure 7 is an enlarged sectional view taken along line 7—7 of Figure 5.

Figures 8, 9 and 10 are partial sections taken along lines 8—8, 9—9 and 10—10, respectively, of Figure 7.

Figure 11 is a detail section taken along line 11—11 of Figure 10.

Figure 12 is a horizontal section through the car and is taken along line 12—12 of Figure 7.

Figure 13 is an enlarged detail section taken along line 13—13 of Figure 12.

Figures 14 and 15 are detail sections taken along lines 14—14 and 15—15, respectively, of Figure 7.

The apparatus is illustrated in connection with conventional receiving pit facilities, the latter being sufficiently indicated for the purpose in view by a showing of the chute 15 which the material enters upon being discharged from a car. The unloading of a car in accordance with the invention involves the lowering of the side of the car adjacent the receiving pit until the car assumes an angle of 18°, more or less, with respect to the vertical. To this end the inner rail 16 of the track, the rail adjacent the chute 15, includes short sections 16a which are so located that when a car comes to rest with its doorway located above and opposite the receiving pit the inner wheels of one truck will rest upon one of the said sections and the inner wheels of the other truck will rest upon the other.

Each of the rail sections 16a is mounted upon a beam 17 which is carried by the outer ends of a pair of arms 18. The said arms extend under a beam 19 which carries the outer rail 20 of the track and have extensions 21 which are suspended upon trunnions 22, the latter being located on the far side of the outer rail and being carried by angularly extending brackets 23. The rail sections 16a are normally supported in rectilinear arrangement with and between the fixed sections of the rail 16 by the legs 24 (Figures 3

and 5) of U-shaped supports 25. The latter are supported for rocking movement upon shafts 26 which are mounted upon base plates 27 and carry laterally extending arms 28 to which the lower ends of operating levers 29 are connected.

The rail sections 16a may be lowered and elevated as required, assuming the supports 25 occupy positions in which the legs 24 are clear of the beams 17, by hydraulic jacks 30 (Figure 5). Preferably a pair of such jacks is employed in connection with each of the rail sections, the pistons 31 of each pair of jacks being pivotally connected to laterally extending lugs 31a at the opposite ends of the associated carrier beam while the cylinders 32 are pivotally connected to upwardly extending lugs at the opposite ends of the associated base plate 27. The jacks are operated by a pump 33 which is driven by a motor 34, the pump having four cylinders 35, one for each jack and each of which is connected by a fluid supply line 36 to a valve 37 and through the latter and a supply and exhaust line 38 to its respective jack. The intake side of each of the cylinders of the pump is connected to a common intake line 39 which leads to a reservoir 40. The movable element 41 (Figure 6) of the valve 37 is cylindrical, is provided with a stem 42 (Figure 5) which carries a control handle 43, is formed with passages 44 and is adjustable to connect each of the supply lines 36 with one of the supply and exhaust lines 38. The movable element 41 is also adjustable so that the passages 44 connect each of the supply and exhaust lines to a by-pass duct 45 formed in an exhaust manifold 46, each of the said ducts communicating through a restricted opening 47 and a transverse bore 48, both of which are formed in a plug 49, with an outlet chamber 50 (Figure 6a). Fluid which enters the latter is discharged through an exhaust pipe 51 into the reservoir 40.

To lower the rail sections 16a the valve 37 is preferably initially adjusted to connect the lines 36 and 38 and the pump 33 operated momentarily to insure that the jacks 30 are filled and to relieve pressure upon the supports 25 so that the levers 29 may be readily operated to swing the legs 24 to one side of the carrier beams 17, as indicated in dotted lines in Figure 3. The valve 37 may then be adjusted to connect the lines 38 to the by-pass ducts 45, and the actuating fluid is permitted to discharge from the jacks and return to the reservoir 40, the restricted openings 47 in the plugs 49 limiting the discharge of the fluid from the cylinders of the jacks so that the downward movement of the rail sections 16a will not exceed a predetermined rate.

As the rail sections are lowered in the manner described the car is tilted, guard rail sections 52 preferably being employed in connection with the outer rail to limit sidewise movement of the wheels upon the rails during this operation. In accordance with the invention the movement of the car as it is tilted is utilized in the breaking in of the cooperage which closes the doorway of the car door. To this end a supporting framework 53 is mounted behind the chute 15 upon a base 54 which may, if desired, be in the form of a turntable. Stanchions 55 of the said framework have upper ends which are angularly inclined toward the car and carry a cross shaft 56 upon which a carriage 57 is mounted for rocking movement. The carriage 57 includes side frames 58, which are generally rectangular in shape, and carries a platen 59 having the outer face thereof studded with spikes 59a. The platen is attached to the carriage by links 60 which have pivotal connections with the frame members of the carriage and with the platen and which, therefore, are adapted to permit parallel movement of the platen toward and away from the carriage. The platen may be locked in any desired position by an arm 61 which is carried by the shaft 56 (Figures 7, 10 and 11), the outer end of the said arm being formed to provide a crosshead 62 having trunnion-like extensions which are slideable in guideways 63 and 64 formed in track members 64a which are mounted upon the back of the platen. The inner wall of the guideway 64 is formed with teeth 65 which may be engaged by the outer end of a locking pin 66, the latter occupying a transverse bore in the crosshead. A slide 67 which occupies a longitudinally extending bore has a cam extension 68 formed on one end which is located between spaced projections 69 at one end of the pin. The opposite end of the slide is connected to a plunger 70, one end of which extends into, and axially of, a solenoid 71. A spring 72 which is arranged around the outer end of the plunger normally acts against the latter to hold the slide 67 in its extended position, in which position the locking pin is caused to extend between two of the teeth 65. To release the crosshead it is only necessary to energize the solenoid 71. The latter will thereupon retract the slide 67 against the action of the spring 72 and the cam extension will actuate the locking pin to withdraw it from between the engaged teeth. Upon release of the locking pin 66 a motor 73 (Figure 12) may be energized to move the platen 59 to the desired position, the motor being of the gear-headed type and carrying and driving a winch 74. A cable 75 which is wound upon the drum of the latter has one end 76 (Figure 7) which passes around a pulley 77 and is connected to an end flange 78 on the platen while the other end 79 of the cable passes over a freely rotatable sleeve on the cross shaft 56 and is connected to the platen between said end flange and the opposite end flange. The platen, therefore, may be adjusted as required by running the motor 73 in the proper direction, it being noted that the trunnion-like extensions of the crosshead 62 are slideable along the guideways 63 and 64 and at the same time permit relative angular movement between them and the platen.

Mechanism is provided for rocking the carriage 57 upon the shaft 56 from one position in which the platen is substantially vertical to a second position in which it is substantially horizontal. The said mechanism includes a gear-headed motor 80 (Figures 7 and 12) which is mounted upon the back of a cross frame member 81 of the carriage, the driving gear 82 of the motor meshing with an idler gear 83 (also carried by the motor) and the gear 83 in turn meshing with a driven gear 84. The latter is fixed to a shaft 85 and meshes with a gear 86 which is fixed to a shaft 87. The gear 86 meshes with and drives a pinion 88 which is fixed to a shaft 89 (Figure 7). A beveled pinion 90 (Figure 12) which is splined upon the outer end of the shaft 89 acts as a driver for a pinion 91 but is normally disengaged from the latter. It may be shifted into engagement with the pinion 91 by a lever 92 which is pivotally connected at its inner end to a side frame and at its outer end to the movable element of an electrical actuating unit 93.

The pinion 91 is fixed to one end of a shaft

94 which is carried by a bearing block 95, the other end of the shaft 94 carrying a worm 96 which meshes with a worm wheel 97. The latter is fixed to one end of a shaft 98 (Figure 5) which is mounted between the two side frames 58 and which carries two pinions 99, one of which meshes with a segmental gear rack 100 carried by the angular extension of one of the stanchions 55 and the other of which meshes with a similar gear rack 101 carried by the angular extension of the other stanchion.

When the apparatus is not in use the carriage 57 occupies an upright position with the platen 59 collapsed as indicated in dotted lines in Figure 1. In such position substantial clearance is provided between the platen and any car which may be moved to, or past, the receiving pit. When a car has been moved to an unloading position, assuming the motor 80 to be energized, the actuating unit 93 is energized to engage the pinion 90 with the pinion 91 and the carriage 57 is rocked upon the shaft 56 to advance the lower end of the platen toward the doorway of the car. At the same time, or incident to this operation, the solenoid 71 is energized to release the locking pin carried by the arm 61 and the motor 73 is energized to operate the winch 74, thereby to cause the platen 59 to swing downwardly and outwardly upon the links 60. The rocking movement of the carriage and the swinging movement of the platen are preferably simultaneous and are so controlled that the lower edge of the platen is caused to engage the lower edge of the cooperage 102 just above the sill of the car doorway. Thereupon the lever 92 is operated to disengage the pinion 90 from the pinion 91; the motor 73 is deenergized to arrest the platen 59; and the solenoid 71 is deenergized to release the locking pin 66 and permit it to engage the teeth 65 and lock the platen and carriage against relative movement.

The carriage and platen are shown in the positions described in full lines in Figure 1. While occupying such positions the adjacent side of the car is lowered in the manner described. During this operation the platen 59 enters the car through the doorway, as illustrated in Figure 2, to break in and push ahead of it the cooperage which is impaled upon the spikes 59a. The path of the platen is upward as well as inward. Hence a substantial opening at the bottom of the doorway is provided through which the material in the car may discharge and as a result of which the pressure upon the back of the cooperage will be partially or wholly relieved.

After the cooperage has been broken in in the manner described the lever 92 is again actuated to engage the pinion 90 with the pinion 91 and the carriage 57 is rocked upon the shaft 56 to the substantially horizontal position shown in Figures 4 and 7, thereby carrying the cooperage into the top of the car and clearing the lower part of the doorway. As the cooperage approaches the top of the car the locking pin 66 may be released to disconnect the arm 61 and the platen; and the winch 74 may be operated to collapse the platen upon the carriage. Maximum movement of the carriage toward the top of the car will thus be insured.

Shovels 103 and 103a are employed to convey to the doorway such of the material as is not automatically discharged by the breaking in of the cooperage and the tilting of the car, the shovel 103 being operated by cables 104 and 105 (Figure 12) and the shovel 103a by cables 106 and 107. One end of the cable 104 is wound upon one end of a drum 108 which is mounted upon the shaft 85 while the opposite end is connected to the back of the shovel 103, the said cable intermediate its ends passing over a freely rotatable sleeve on the shaft 56, around a pulley 109 which is fixed to the carriage 57 and around a pulley 110 carried by a block 111. The corresponding cable (106) for the other shovel passes over a similar sleeve and around similar pulleys, one end being wound upon the opposite end of the drum 108 and the opposite end being connected to the back of the other shovel. The cable 105 is connected at one end to the front of the shovel 103, passes around a pulley 112 and under a roller 112a (Figure 7) and is wound upon one end of a drum 113 which is mounted upon the shaft 87. The cable 107 is similarly connected to the other shovel, passes around a pulley 114 and under the roller 112a and is wound upon the other end of the drum 113.

The drums 108 and 113 are freely mounted upon the shafts 85 and 87, respectively, and each includes a conventional internal clutch for connecting it to its respective shaft, the clutch in each instance being controlled by an electrical actuating unit 115 (Figure 12). Hence the drum 108 may be connected to the shaft 85 to move the shovels from the ends of the car toward the doorway while the drum 113 may be connected to the shaft 87 to move the shovels from the doorway toward the ends of the car. Preferably an electric brake 116 (Figures 7 and 12) is employed in connection with each drum, the bands 117 thereof fitting around central annular enlargements on the drums. When either of the drums is connected to its shaft the brake for the other drum may be operated to maintain the proper tension upon the cables.

A cab 118 (Figure 7) for the operator is provided at the end of the carriage which extends into the car, the cab preferably being closed and having a door and windows through which the operation of the shovels may be observed. Fresh air is forced into the cab by a fan 119, the intake pipe 120 thereof carrying a filter 120a for removing entrained dust. The invention contemplates the use of the fan 119 to maintain a pressure in the cab slightly higher than atmospheric pressure. Entry into the cab of dust, odors or fumes will thus be prevented.

The operator may sit upon a cushion 121 straddling a pair of levers 122 and 123, one of which controls the drum clutches and the other of which controls the drum brakes. A platform 124 is also carried by the front wall of the cab upon which the operator may stand when the carriage is in an upright position, there being a control device 125 on the side wall of the cab for controlling the rocking movement of the carriage. A similar device 125a may be mounted upon the framework 53 for controlling such movement exteriorly of the cab.

The cable pulleys 112 and 114 are carried by the outer end of a boom 126 which is formed with rearwardly diverging legs 126a. The terminal portions of the latter are pivotally connected to the opposite ends of a cross-piece 127 which is carried by a longitudinally extending, threaded shaft 128. A pinion 129 which is splined to the outer end of the said shaft normally meshes with a pinion 130 which is fixed to the lower end of a vertical shaft 131 but may be disengaged by depressing a clutch pedal 132. The shaft 131 is

threaded and carries a cross-piece 133 to the opposite ends of which the inner ends of a pair of arms 134 are pivotally connected, the outer ends of the said arms being pivotally connected to the opposite sides of the outer end of the boom. The inner end of the shaft 128 (Figure 9) carries a pinion 135 with which either of two drive pinions 136 or 137 may be engaged, the said drive pinions being splined upon a shaft 138 and the latter also carrying a gear 139 which meshes with the gear 86. The pinions 136 and 137 are connected by a shifting mechanism including a bar 140, a crank 141 and a link 142, one arm of the crank being connected by a rod 143 to a lever 144 which is located within the cab 118 within convenient reach of the operator.

It will thus be apparent that the lever 144 may be operated to shift either of the pinions 136 or 137 into engagement with the pinion 135 to drive the shaft 128 in either direction and that the clutch pedal 132 may be operated to disengage the pinion 129 (Figure 7) from the pinion 130. The boom 126, therefore, may be adjusted, at will, to advance, withdraw, elevate or lower the pulleys 112 and 114. In this manner the shovels may be caused to traverse paths best adapted to expedite the unloading of the car.

The paths traversed by the shovels are, of course, also dependent to a certain degree upon the location of the pulley blocks 111. As illustrated, the latter are supported in the ends of the car by spreaders 145 (Figure 12) which are formed or provided with spaced eyes 146 through which the hooks of the pulley blocks may be inserted. Each spreader comprises opposed sections 147 and 148, each of which has a triangularly-shaped foot 149. The shank of the section 148 is tubular and the end thereof is forked, as shown in Figure 13, and is pivotally connected by a pin 150 to one end of a rod 151. The opposite end of the rod is adjustable to various positions within a tube 152 and is formed with a transverse bore 153 which may be aligned with openings 154 formed in the tube. The parts may thus be locked in various positions of adjustment by a removable pin 155. The latter also passes through aligned openings in the end of a sleeve 156 which is slideable over the shank of the section 148 and the adjacent end of the tube 152. The opposite end of the tube 152 is formed to provide a plunger 157 and is accommodated within a cylinder 158 which is carried by the shank of the section 147. Pressure may be applied to the plunger 157 by a hydraulic jack 159, the cylinder 160 of the jack being carried by the cylinder 158 and the operating handle 161 being pivotally connected to the shank of the section 147.

In mounting the spreaders in the ends of the car the pin 155 is removed and the sections 147 and 148 are separated to cause the feet 149 to engage the side walls of the car at the proper height and at the same time align the bore 153 with the closest pair of openings 154 in the tube 152, the plunger 157 being caused to enter the cylinder 158 to its innermost limit. The sleeve 156 is then adjusted so that the openings in its end are aligned with the aligned openings in the tube and rod and the pin 155 is inserted. The hydraulic jack 159 is then operated to further expand the spreader sections until the feet thereof engage the side walls of the car with the desired pressure. The hooks of the pulley blocks 111 may then be inserted in the proper eyes on the spreaders.

It will be apparent that in the use of the apparatus any pull applied to the spreaders by the cables which operate the shovels will cause the toe portions of the feet 149 to exert a greater pressure against the walls of the car. Such pull, therefore, tends to cause the spreaders to engage the car walls more firmly. In order to increase the friction between the spreaders and the walls of the car a sole 162 of rubber or any other suitable material may be applied to the feet 149.

To remove a spreader upon completion of the unloading operation it is only necessary to release the pressure in the cylinder 158. The pin 155 may then be removed to permit the sleeve 156 to be slipped back on the shank of the section 148 beyond the pin 150, the pin 155 then being reinserted through the openings in the tube 152 which are aligned with the bore 153. The spreader sections may be then collapsed toward one another, the pin 150 providing a joint for this purpose. A spreader and a shovel may thereupon be supported or suspended in any suitable manner from each side of the carriage and after the slack cable has been taken up, the carriage may be withdrawn from the car in the manner described, the marginal edges of the cooperage being engaged by the side posts of the doorway during this operation and the cooperage being stripped from the spikes on the platen and falling into the bottom of the car.

The valve 37 may then be adjusted to connect the lines 36 and 38 and the pump 33 operated to restore the car to its original position, the supports 25 being rocked upon the completion of this operation to move the legs thereof under the rail sections 16*a*. The use of a pump having a separate cylinder for each of the jacks 30 has the advantage that substantially the same amount of actuating fluid is delivered to each of them. Hence the rail sections 16*a* will be elevated at the same speed. A further advantage obtained is that the crank-shaft may be formed, as illustrated, so that the working strokes of the pistons occur one after the other. The power required to operate the pump is thus much less than would otherwise be required if the working strokes of two or more of the pistons occurred simultaneously. The apparatus has the advantage that it may be readily adapted to existing track and receiving pit facilities and in instances wherein such facilities include double tracks the base 54 may be revolved so that both tracks may be serviced by the carriage.

Although the apparatus illustrated includes means for breaking in the cooperage closing the doorway of a car, it is to be understood that the apparatus may also be employed to advantage in connection with the unloading of cars having sliding or other types of doors which may be readily opened and cars which it may be impossible or undesirable to tilt in the manner described.

I claim as my invention:

1. Apparatus for unloading bulk material from a car through a doorway in the side thereof including a carriage mounted for privotal movement about a horizontal axis, one section of said carriage providing a cab for an operator, drive mechanism carried by said carriage, said carriage having a normal upright position in which it is located at one side of and clear of said car, means for rocking said carriage about said axis to cause said section to enter the car through said doorway, and means under the control of said operator and actuated by said drive mechanism for conveying the material in the car to said doorway.

2. Apparatus for unloading bulk material from

a car through a doorway in the side thereof including a carriage mounted for pivotal movement about a horizontal axis, said carriage having a plenum compartment which provides a cab for an operator and having a normal upright position in which it is located at one side and clear of said car, windows in the sides of said compartment drive mechanism carried by said carriage, means for rocking said carriage about said axis to cause said compartment to enter the car through said doorway, and means which may be observed by said operator through said windows and which is actuated by said drive mechanism for conveying the material in the car to said doorway.

3. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage pivotally mounted for movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, the lower part of said carriage being formed to provide a cab for an operator, driving mechanism carried by said carriage which is under the control of said operator, means for rocking said carriage toward said cooperage and for holding it in the position to which it is moved, means for lowering one side of the car while said carriage is so held to cause said carriage to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cab into said car and to move said cooperage to, and support it in, an elevated position over said cab, and means actuated by said mechanism and which may be observed from said cab for conveying the material to said doorway.

4. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage pivotally mounted for movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, driving mechanism carried by said carriage, means for rocking said carriage toward said cooperage and for holding it in the position to which it is moved, means for lowering one side of said car while said carriage is so held to cause said carriage to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cooperage to, and support it in, an elevated position in the car, and means within the car which is driven by said mechanism for conveying the material to said doorway.

5. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage pivotally mounted for movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, driving mechanism carried by said carriage, means including said driving mechanism for rocking said carriage toward said cooperage, and for holding it in the position to which it is moved, means for lowering one side of said car while said carriage is so held to cause said carriage to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cooperage to, and support it in, an elevated position in the car, and means within the car which is driven by said mechanism for conveying the material to said doorway.

6. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage pivotally mounted for movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, driving mechanism carried by said carriage, an adjustable platen mounted on said carriage, means for rocking said carriage to advance it toward said car, means for extending said platen against said cooperage and for holding it in such position, means for lowering one side of said car to cause said platen to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cooperage to, and support it in, an elevated position in the car, and means within the car which is actuated by said mechanism for conveying the material to said doorway.

7. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage pivotally mounted for movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, driving mechanism carried by said carriage, an adjustable platen mounted on said carriage, means for rocking said carriage to advance it toward said car, means for extending said platen against said cooperage and for holding it in such position, means for lowering one side of said car to cause said platen to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move the cooperage to, and support it in, an elevated position in the car, said platen being collapsible to permit maximum travel of the carriage toward the top of the car, and means within the car which is driven by said mechanism for conveying the material to said doorway.

8. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage pivotally mounted for movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, driving mechanism carried by said carriage, means for rocking said carriage to advance it toward said cooperage and for holding it in the position to which it is moved, means for lowering one side of said car while said carriage is so held to cause said carriage to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cooperage to, and support it in, an elevated position in the car, a shovel, and a cable connecting said shovel and driving mechanism and by which the shovel is moved back and forth lengthwise of the car to convey the material to said doorway.

9. Apparatus for unloading bulk material from a car through a doorway in the side thereof including a carriage mounted for pivotal movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, drive mechanism carried by said carriage, means including said drive mechanism for rocking said carriage about said axis to advance it into the car through said doorway, a shovel, a cable for connecting said shovel and drive mechanism and by which the shovel is moved back and forth lengthwise of the car to move the material to said doorway, a leg ex-

tending from said carriage, a pulley carried by said leg around which said cable is caused to pass, the location of said pulley determining the path traversed by said shovel, and means for adjusting said leg with relation to said carriage to change said path.

10. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage pivotally mounted for movement about a horizontal axis and having upright position in which it is located at one side of and clear of said car, drive mechanisms carried by said carriage, means for rocking said carriage toward said cooperage and for holding it in the position to which it is moved, means for lowering one side of said car while said carriage is so held to cause said carriage to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cooperage to, and support it in, an elevated position in the car, a shovel, a cable connecting said shovel and drive mechanism and by which the shovel is moved back and forth lengthwise of the car to convey the material to said doorway, a leg extending from said carriage, a pulley carried by said leg and around which said cable is caused to pass, the location of said pulley determining the path traversed by said shovel, and means for adjusting said leg to change said path.

11. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage pivotally mounted for movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, drive mechanism carried by said carriage, an adjustable platen mounted on said carriage, means for rocking said carriage to advance it toward said car, means for extending said platen against said cooperage and for holding it in such position, means for lowering one side of said car to cause said platen to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cooperage to, and support it in, an elevated position in the car, said platen being collapsible to permit maximum travel of the carriage toward the top of the car, a shovel, a cable connecting said shovel and drive mechanism and by which the shovel is moved back and forth lengthwise of the car to convey the material to said doorway, a leg extending from said carriage, a pulley carried by said leg and around which said cable is caused to pass, the location of said pulley determining the path traversed by said shovel, and means for adjusting said leg to vary the path of said shovel.

12. Apparatus for unloading bulk material from a car having a doorway closed by cooperage, said apparatus including a carriage mounted for pivotal movement about a horizontal axis and having a normal upright position in which it is located at one side of and clear of said car, drive mechanism carried by said carriage, means for rocking said carriage to advance it to a position in close proximity to said cooperage and for holding said carriage in said last named position, means for lowering one side of said car while said carriage is so held to cause the latter to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cooperage to, and support it in, an elevated position in the car, a shovel, a cable connecting said shovel and drive mechanism and by which the shovel is moved back and forth lengthwise of the car to convey the material to said doorway, a leg extending from said carriage, a pulley carried by the inner end of said leg and around which said cable is caused to pass, the location of said pulley determining the path traversed by said shovel, and means for advancing and retracting said leg and for elevating and lowering the outer end thereof.

13. Apparatus for unloading bulk material from a car through a door in the side thereof including a carriage pivotally mounted for movement about a horizontal axis and having one section which provides a cab for an operator, said carriage having a normal upright position in which it is located at one side of and clear of said car, drive mechanism carried by said carriage and under the control of said operator, an adjustable platen mounted on said carriage, means for rocking said carriage to advance it toward said car, means for extending said platen against said cooperage, means for lowering one side of said car while said carriage and platen are held in the positions described to cause said platen to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cab into said car and to move said cooperage to, and support it in, an elevated position over said cab, and means actuated by said mechanism and which may be observed by said operator for conveying the material to said doorway.

14. Apparatus for unloading bulk material from a car through a door in the side thereof including a carriage mounted for pivotal movement about a horizontal axis and having one section which provides a cab for an operator, said carriage having a normal upright position in which it is located at one side of and clear of said car, drive mechanism carried by said carriage and under the control of said operator, an adjustable platen mounted on said carriage, means for rocking said carriage to advance it toward said car, means for extending said platen against said cooperage, means for lowering one side of said car while said carriage and platen are held in the positions described to cause said platen to enter said doorway and break in said cooperage, said first named means being thereafter operative to rock said carriage further in the same direction to move said cab into said car and to move said cooperage to, and support it in, an elevated position over said cab, a shovel, a cable connecting said shovel and drive mechanism and by which the shovel is moved back and forth lengthwise of the car within view of said operator to convey the material to said doorway, a leg extending from said carriage, a pulley carried by said leg and around which said cable is caused to pass, the location of said pulley determining the path traversed by said shovel, and means for adjusting the position of said leg to change said path.

EDWARD E. FRAUENHEIM, JR.