

April 6 , 1926.

1,579,927

J. GRIESS

ROLLING CAR DUMPER

Filed Jan. 7, 1925

4 Sheets-Sheet 1

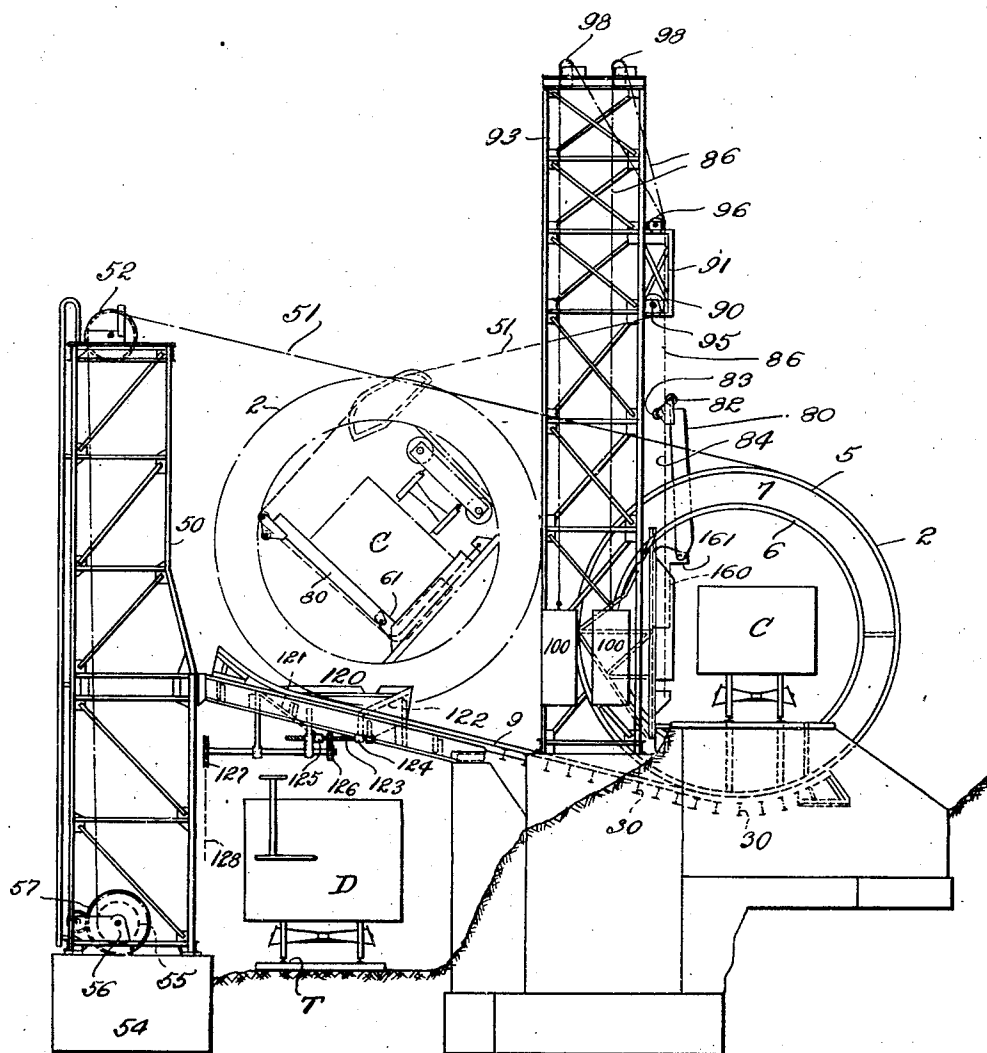


FIG.-1

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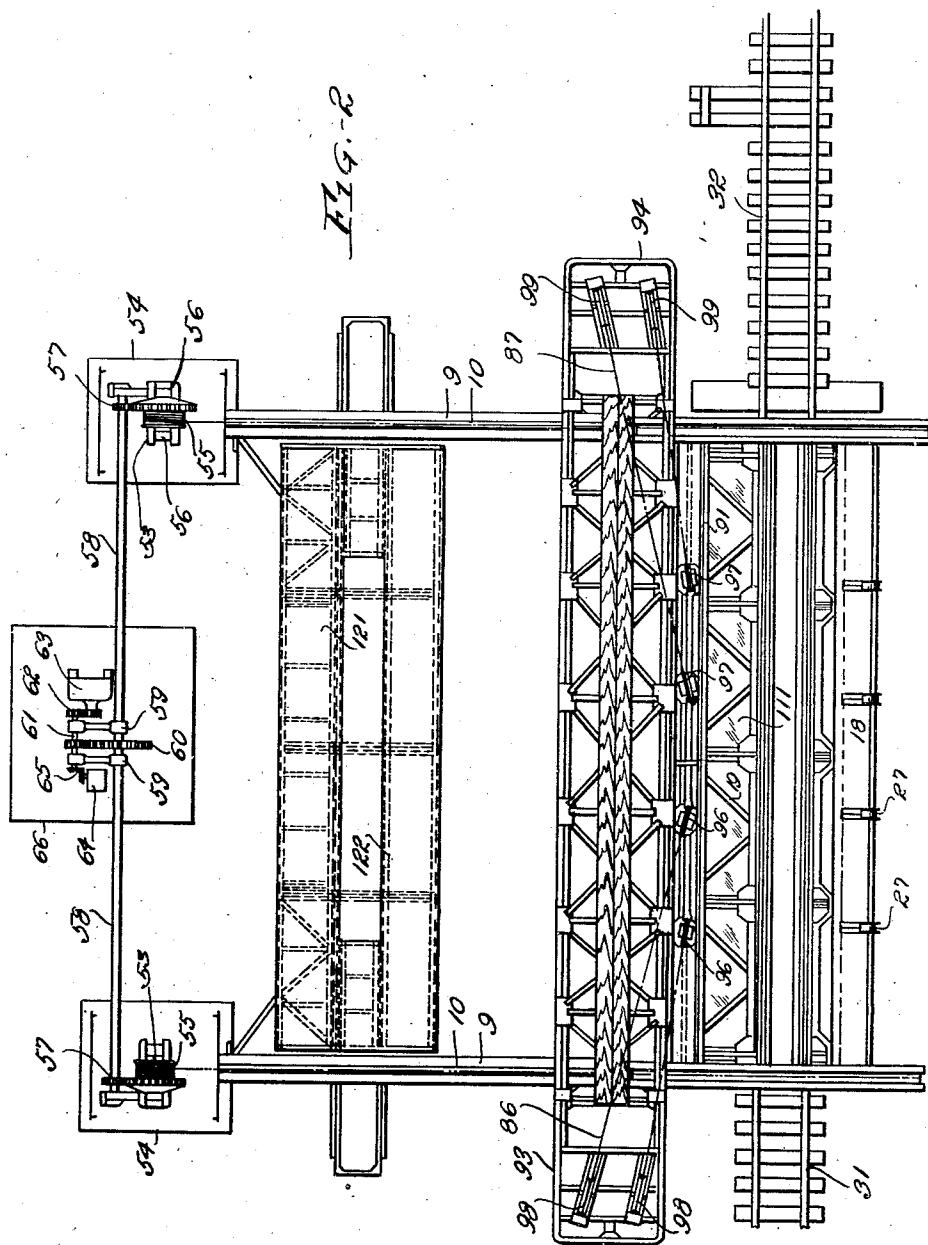
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4 Sheets-Sheet 2



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ROLLING CAR DUMPER

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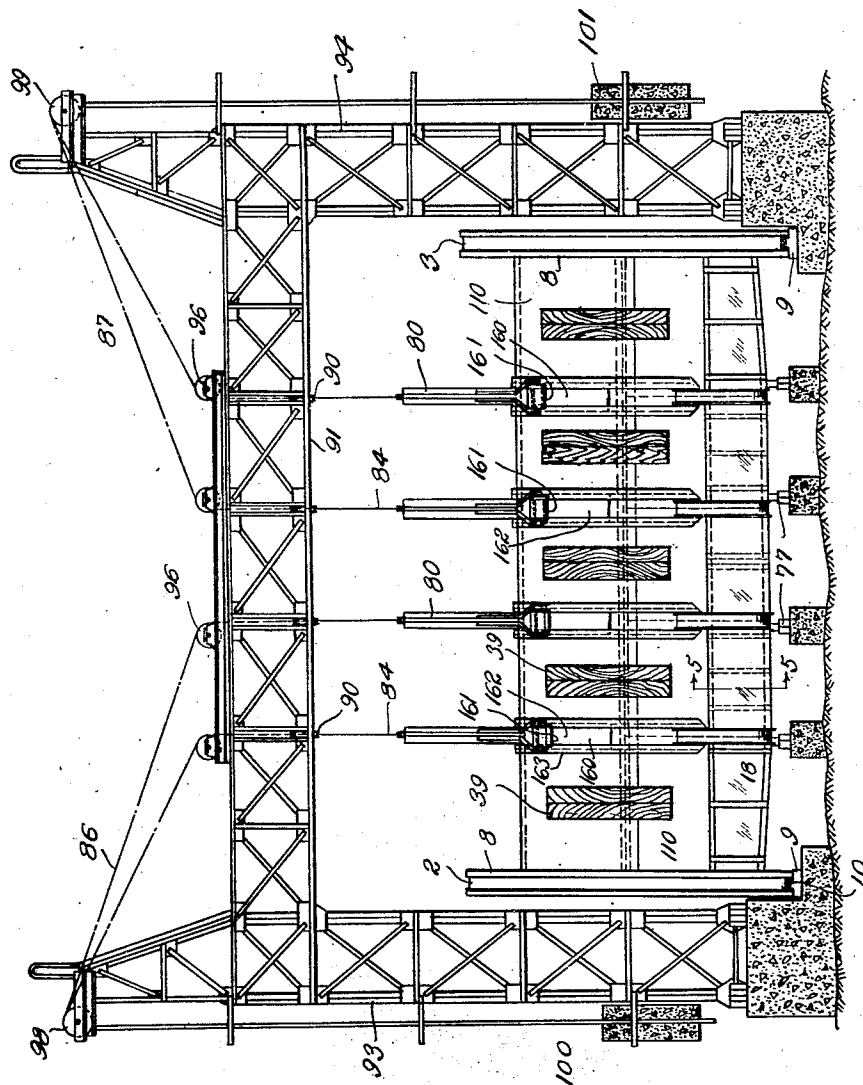


FIG. 3

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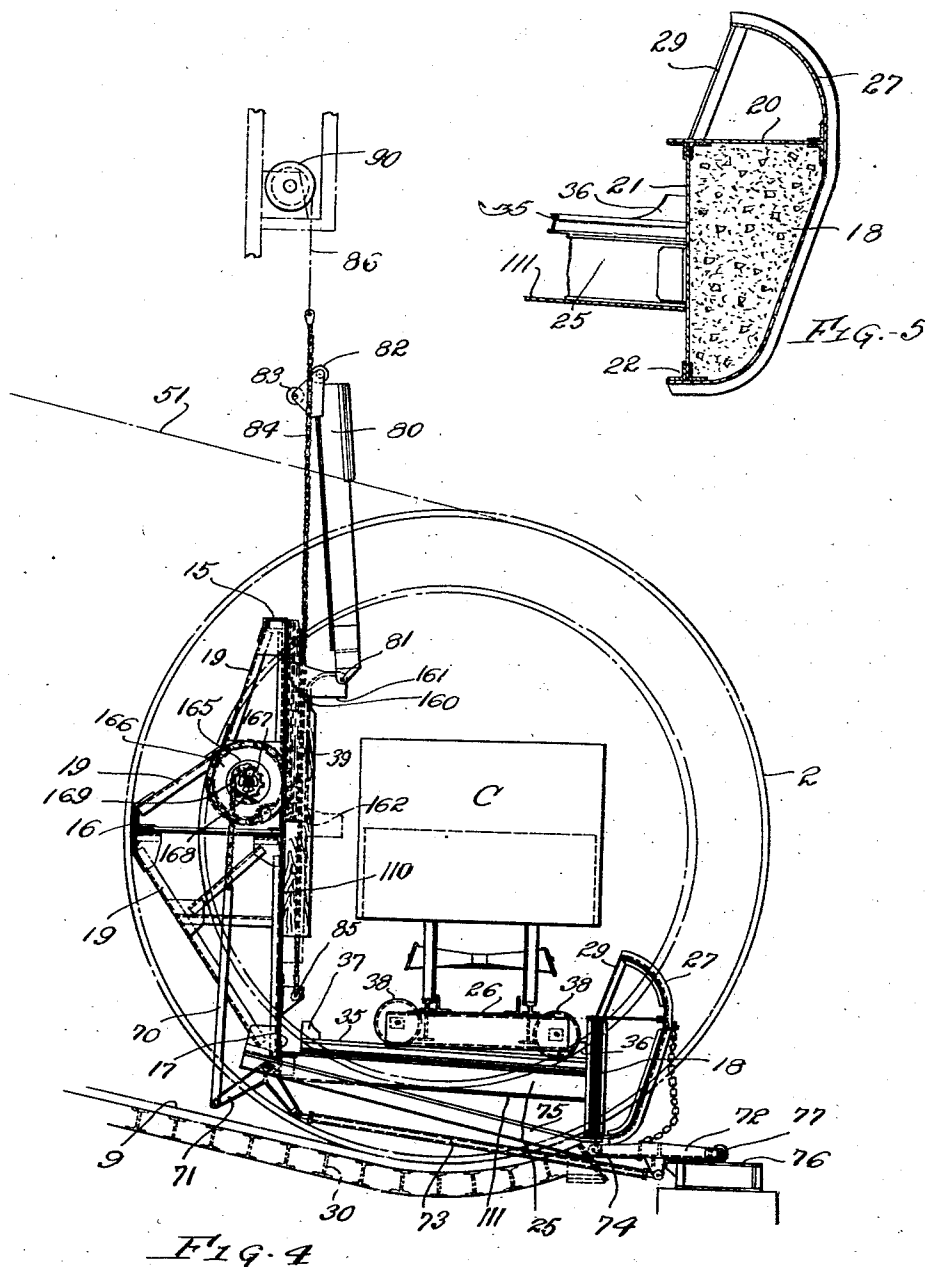
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ROLLING CAR DUMPER

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

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ROLLING CAR DUMPER.

Application filed January 7, 1925. Serial No. 941.

To all whom it may concern:

Be it known that I, JUSTIN GRIESS, a citizen of the United States of America, residing at Bedford, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in a Rolling Car Dumper, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to car dumpers of the rolling or cradle type and has for its general object the provision of an apparatus for effecting the rapid reception and dumping of railroad cars containing coal or like material into a receptacle positioned diagonally below the car to be dumped.

One of the objects of the invention is to provide for the return of the car by gravity to its initial position after it has been dumped, which force may also effect the repositioning of the car clamping apparatus.

Another object of my invention is to provide a novel counter-balance for the dumping cradle of a car dumper, so constructed and positioned as to insure the return of the cradle and car and the various operating parts of the cradle to initial position after dumping, irrespective of the weight of the car.

One of the features of my invention is the novel arrangement of a car clamping apparatus in a rolling car dumper for effecting the clamping of the car to be dumped, entirely by counter-weights. Further objects will become apparent in the following description of my invention, which pertains to the accompanying drawings. The essential characteristics are summarized in the claims.

In the drawings Fig. 1 is an end elevation of my car dumper showing the relative position of the car to be dumped and a receptacle which in the present instance is a receiving car. Fig. 2 is a plan view of my car dumper. Fig. 3 is a side elevation thereof. Fig. 4 is a somewhat diagrammatical view of the rolling unit of the car dumper. Fig. 5 is a detail in vertical section illustrating the cradle counterweight.

The embodiment chosen for the purpose of illustrating my invention is particularly adapted to be operated in conjunction with mining operations in mountainous country, wherein by reason of an abrupt slope from the mine to a railroad bed, stream or canal,

it is difficult to arrange the desired derricks, and hoisting mechanism for operating a car dumper to secure the greatest efficiency thereof.

To attain the objects outlined in the preceding paragraphs I prefer to provide a car receiving frame or cradle which is adapted to roll along a trackway extending transversely of the car tracks. The trackway is in the nature of a bridge and preferably rests at one end upon a substantial foundation adjacent the tracks which carry the cars to be unloaded. The other end of this bridge-like structure extends above the track upon which receiving cars run (or a stream for barges as the case may be) and is supported by towers. These towers may also carry portions of the dumping frame hoisting or rolling mechanism. The clamping devices for the cars to be unloaded are carried by the dumping frame and are arranged to be acted on by an unique system comprising counterweight supporting towers, sheaves and cables erected above the cradle trackway.

The structure of the cradle preferably comprises a pair of rings 2 and 3 at either end thereof suitably fastened together and braced against warping. The preferred construction of these end frames or rings results in annular girders, made up in the usual manner of peripheral plates 5 and 6 and a vertical flat spacing web 7. Upon the outer periphery of the plate 5 I prefer to mount guiding ribs 8 adapted to rest upon a trackway 9. The trackway has an upwardly extending tongue throughout its length indicated at 10 which lies between the two ribs or flanges 8 to guide the cradle along the track. Suitable longitudinal beams of the desired sections shown at 15, 16 and 17 and a box-like beam member 18 serve to connect the rings. Suitable lacing members indicated generally at 19 serve to truss the beams.

The member 18 as shown in Fig. 5 comprises generally an inverted L shaped structural unit, made up of plates 20 and 21 suitably braced and fastened together by angle bars 22. This beam 18 serves to support one end of transverse beams 25, the other ends of which are connected to the other side of the cradle. These beams carry tracks 35 on which rest the rollers 38 of a carriage 26 which has tracks 39 for supporting the car. Also by reason of its box-like structure and

its position it may serve to contain a quantity of material such as concrete, which will act as a counterweight to return the cradle to initial position after dumping.

5 On its outer side the beam supports a series of cable guides 27 curved as shown and secured to the outer ends of the plates 20 and 21, and supported at their upper ends by short compression members 29.

10 The track 9 upon which the cradle is adapted to ride in dumping is shown in the present instance, as inclined upwardly from its initial position and is supported at the bottom of the incline by a heavy base of concrete or tressel work. This cradle track 15 bridges the trackway upon which the receiving cars are placed. The outer ends of the cradle tracks are by towers 50. At the other end the trackway is preferably supported 20 by and secured to a series of transversely placed I beams 30.

The cradle is caused to roll up the trackway to the position shown in broken lines in Fig. 1, by means of cables 51 wrapped 25 about the circular girders between the ribs 8. The height of the ribs is sufficiently greater than the height of the tongue 10 to afford an adequate clearance for the cables. At the top of the towers 50, I prefer to provide 30 sheaves 52 over which the cables are led to the hoisting mechanism 53 preferably mounted near the bottoms of the towers. The height of the tower is such that the angle of pull of the cables is substantially 35 equal throughout the entire travel of the cradle with reference to the tracks.

Any suitable motor driven hoisting mechanism may be employed but I prefer to provide a pair of hoisting drums 55 mounted in 40 bearing brackets 56 on the foundations 54 of the towers. I prefer to provide mechanism for rolling the cradle comprising a shaft 58 which may be supported intermediate its ends upon a base 66 disposed between the 45 two towers as shown in Fig. 2. Brackets 59 comprise bearings rotatably supporting the shafts. The ends of the shaft 58 are supported on bearing brackets resting on the base structures 54. Suitable reduction 50 gearing 57 drivingly connects the shaft 58 to the drums. The motor drive comprises differential reduction gearing 60, carried by the shaft 58 and a jack shaft 61, which is connected by a pair of spur gears 62 to a 55 motor 63 at one of its ends and this shaft drives a limit switch 64 through a pair of bevel gears 65 at its other end. The limit switch is so adjusted that upon the required number of rotations of the jack shaft the flow of current to the motor is reversed to 60 effect the return of the cradle. Any type of limit switch may be used which will accomplish this result.

The trackway supporting the cradle may 65 be inclined if desired to effect the return

movement of the cradle by gravity. As shown in Figs. 1 and 4 of the drawings, the lower end of the trackway rises in a curve complementary to the periphery of the cradle end rings to provide a stop for the 70 cradle upon its return movement. This also affords a convenient manner of aligning the rails on the car supporting carriage 26 with the rails of the stationary trackways 31 and 32 which terminate close to the open 75 ends of the dumping cradle. The transverse bars 25 in the cradle frame may carry rails 35 on either end of which are mounted abutment stops 36 and 37. The rollers 38 on the car carriage rest upon the rails and 80 bear against the abutment stop 37, when the car is being dumped.

In Fig. 4 the cradle is shown in its lowermost position and the right hand rollers of the carriage bear against the stop 36 by rea- 85 son of the weight of the car on the inclined rails. Upon the movement of the cradle, occasioned by the pull of the cable 51, the track 35 assumes a horizontal position and then inclines downwardly to the left. The 90 car C, to be dumped is carried down the incline on the carriage until it strikes against a series of bumpers 39 placed at intervals along the bracing framework of the cradle as best shown in Fig. 3. At the same time 95 the car clamping mechanism is released from its idle position and operates to hold the car in place. This clamping mechanism will now be described.

I prefer to employ several clamps, each 100 having an overhanging jaw 161 adapted to engage the edge of the car and a shank 162 which moves freely in a slideway 163, positioned on the cradle frame. Near the lower 105 end of the shanks 162 I have shown chains which may be secured thereto in any suitable manner and which may extend upwardly and about the periphery of compound drums 165. Each compound drum consists 110 of a sprocket wheel 166 and a small sprocket wheel 167 rigidly mounted upon a shaft 168 extending substantially the length of the cradle and mounted in brackets (not shown) on the frame. The smaller sprocket wheels 115 have anchored to them chains 169. The chains are attached to links 70 and the links are connected to bell cranks 71, which are in turn connected to control arms 72 and by 120 links 73. The arms 72 are pivoted at 74 to frame members 75, and as shown in Fig. 4 rest upon supporting plates 76, disposed to the right and below the cradle. In this position the weight of the cradle holds the 125 arms in raised position and reacts through the links, bell cranks and sprockets to hold the jaw portion of the clamps suspended above the level of the car body.

When the cradle has moved a sufficient distance to bring the car body against the 130 bumpers, the central arms 72 will have dis-

engaged the plates 76, allowing the clamps to fall of their own weight on the edge of the car. As the cradle is moved up the incline, auxiliary clamping arms 80, pivoted to the jaws of the sliding clamps at 81 and each carrying a pair of oppositely disposed rollers 82 and 83 and are caused to embrace the top of the car. To accomplish this I provide chains 84 secured to the cradle frame and which extend upward between the rollers as shown in Fig. 3 to cables 86 and 87, guided therefrom by suitable sheaves to pendant counter-weights. These I provide of sufficient weight to support cars of the maximum weight likely to be accommodated by the dumper, when the cradle is overturned.

For supporting these counter-weights I prefer to erect towers 93 and 94 a short distance from either end of the cradle. The towers are made up of suitably braced structural members, in the usual manner and support a bridge 91 also constructed of the usual structural frame members. Sheaves 90 are shown as carried by brackets 95 near the lower side of this bridge and adapted to turn in a plane parallel to the direction of movement of the cradle. The cables 86 and 87 extend over the sheaves to angularly disposed sheaves 96 and 97 near the top of the bridge, and from these to similarly disposed sheaves 98 and 99. These latter surmount the towers 93 and 94 respectively and from them the cables descend to counter-weights 100 and 101.

Accordingly, when the cradle is being rolled along its trackway the chains 84 guided by the rollers 82 and 83 on the clamp arms tend to swing the upper ends of the arms downward against the edge of the car opposite to that gripped by the jaws 161 while the continued rotation of the cradle causes the chains to wrap about the car as shown in the dot and dash position in Fig. 1. The car is thereby supported and securely held in place upon the rails of the carriage 26.

As the car is overturned during its travel a quantity of the material therein contained is likely to spill over the edge adjacent the bumpers and to catch this and prevent it from becoming scattered along the trackway I have provided an apron 110 (Fig. 3) completely closing the back of the cradle and which extends forwardly beneath the car carriage as indicated at 111 (Fig. 5) to the frame member 18. This spill is dumped along with the contents of the car into a hopper 120 super-posed above the receiving trackway, and thence into the receiving car D. This hopper is preferably built with pivoted inclined sides 121 and 122 for deflecting the material into the receiving car. Hopper controlling mechanism is provided

which may comprises a worm 123, floating nuts 124, and 125 and gearing 126 connected to the worm and controlled by the usual sprocket and chains 127 and 128. This serves to deflect the material into whatever size and shape of vessel or car may be used in connection with my dumper.

It will be seen that I have provided a car dumper adaptable for topographical conditions, in a very simple manner and with a minimum amount of material and expense. Moreover I have so designed the dumper that it may be used with equal effectivity in any sort of terrain with but very slight modifications of form without departing from the spirit of my invention. It will also be apparent from the foregoing that my invention is adaptable to rolling car dumpers regardless of whether the track be level or inclined, or if inclined, regardless of the direction or degree of inclination.

I claim—

1. In a car dumper, a cradle adapted to be rolled, and having openings in the ends thereof for receiving a car longitudinally of the cradle, a transversely shiftable carriage for the car carried by the cradle, a normally inclined support for the carriage, clamping mechanism adapted to engage the car by gravity when the cradle is rolled, and means whereby the initial rolling of the cradle causes the car and carriage to shift to a position where the car may be engaged by the clamping mechanism, and flexible suspension means acting on the clamping mechanism to support the car when the cradle is rolled to dumping position.

2. A rolling car dumper comprising a plurality of annular frame members, means for connecting the frame members and for supporting a carriage, a longitudinal track mounted upon the carriage for receiving the car, a transverse trackway for the carriage, car clamping means normally held in inactive position by the weight of the cradle, means for rolling the cradle, mechanism, active upon the initial rolling of the cradle, for allowing the car to shift relative to the cradle to a clamping position, and means including a cable engaging the clamping means and adapted to pass over the top of the car and across one side for suspending the car in place while dumping.

3. In a car dumper, a cradle adapted to be rolled, a trackway therefor, annular frame members at the ends of the cradle, bracing means connecting the frame members, a transverse trackway rigidly mounted upon the bracing means, a carriage movably mounted upon the trackway and adapted to support a car to be dumped, a tower stationary relative to the cradle, counter-weights and cables carried by the tower, and

means whereby the ends of the cables loop about the car to hold it in place on the cradle when said cradle is rolled.

4. In a car dumper, a cradle adapted to be rolled, annular frame members at the ends of the cradle, an L-shaped bracing structure extending between the frame members, a transverse trackway rigidly mounted upon the foot of the L, a carriage movably mounted upon the trackway adapted to support a car to be dumped, means for rolling the cradle to dump the car, and means comprising a box like bracing frame at the toe of the L adapted to contain a mass of counterweight material, for returning the cradle and car to upright position.

5. A rolling car dumper comprising a plurality of annular frame members, means for connecting the frame members and for supporting a carriage, means mounted upon the carriage for receiving the car, car clamping means normally held in inactive position by the weight of the cradle, trackway members for the cradle, means for rolling the cradle along the trackway and clamping the car, a hopper carried between said trackway members, and controlling means whereby the cradle is returned to initial position consequent upon reaching the hopper.

6. In a car dumper, a cradle adapted to roll along an inclined trackway, means for receiving and shiftingly supporting a car within the cradle, a trackway adapted to support the cradle, mechanism for rolling the cradle along the trackway, and means initiated by the rolling of the cradle for causing the car to shift transversely thereof, and means including a tower cable and counterweight for holding the car in suspended and clamped position, when the car is being dumped.

7. In a car dumping apparatus, a plurality of annular frame members, an L-shaped bracing structure connecting the frame members, flanges carried by the frame members, a trackway complementary to the flanges, clamping mechanism carried by the cradle, auxiliary clamping arms pivoted thereto, hoisting cables secured to the clamping mechanism and guidingly supporting the ends of the auxiliary arms, an arch subtending the car dumper, and means carried by the arch for connecting the cable to counterweights, whereby when the cradle is rolled from beneath the arch the car is maintained in clamped position against the leg and foot of the L-shaped member.

8. A car dumping apparatus comprising in combination a cradle, a trackway therefor, means for supporting a car upon the cradle, a plurality of cables secured to the cradle, clamping arms supported in disengaged position by the cables, means including mechanism for rolling the cradle along a trackway for causing the arms to engage

the car and for causing the cable to loop about the car when the cradle is rolled, and to support the car in inverted position upon the cradle.

9. In a car dumper, a trackway, a cradle adapted to roll upon the trackway, a tower supporting the trackway at one end, a hopper carried by the trackway adjacent the tower, means for rolling the cradle to a position above the hopper, a shiftable carriage within the cradle adapted to support a car, and means co-acting with the shiftable carriage and comprising cables and counterweights for holding the car upon the cradle when it is moved to position above the hopper.

10. In a car dumper, a pair of cylindrical frames bracing members rigidly connected to the frame, means adapted to support a car to be dumped carried by said members, flexible members and clamping arms secured to the cradle and adapted to form a loop about the car to support it in dumping position, a pair of towers disposed near the ends of the cradle, a bridge subtending the towers, sheaves supported by the bridge and towers for guidingly supporting the flexible member, and means carried by the towers to maintain the loop about the car.

11. In a car dumper, a trackway a pair of cylindrical frames bracing members rigidly connected to the frames, means for rolling the frames along the trackway, a movable carriage adapted to support a car to be dumped and carried by said bracing members, cables and clamping arms secured to the bracing members and adapted to loop about the car to support it in dumping position, a pair of towers disposed near the ends of the cradle, a bridge spanning the towers, sheaves carried by the bridge and towers for guiding the cable, and counterweights supported by the cables from the sheaves on the towers.

12. In a car dumper having a rolling cradle, a shiftable car supporting carriage, and car clamping means actuated upon an initial rolling movement of the cradle to a car engaging position and means for exerting pressure on the clamping means after the car supporting carriage has shifted and the clamping means has engaged the car.

13. In a car dumper having a rolling cradle, a car supporting carriage shiftable mounted on the cradle, and car clamping means simultaneously actuated with the car shifting movement of said carriage, means acting after the engagement of the clamping means with the car for retaining the clamping means in said engagement during subsequent rolling of the cradle and means for rolling said cradle.

14. In a car dumping apparatus, the combination of a cradle adapted to be rolled, a platform therein adapted to support a car,

a clamp for the car normally elevated and free from the car, mechanism for holding the clamp in this position when the cradle is in normal position, said mechanism releasing the clamp and enabling it to descend by gravity onto the car during the early part of the rolling of the cradle, and mechanism for holding the clamp in engagement with the top of the car during further rolling of the cradle.

15. In a car dumper, the combination with a cradle adapted to be turned, a platform therein adapted to support a car, an inclined trackway for the platform giving it a tendency to move away from the location toward which the cradle turns in unloading, a clamp carried by the cradle and located in the region adjacent the elevated side of the platform, mechanism carried by the cradle and coacting with an extraneous member for holding the clamp in idle position when the cradle is in normal position, while allowing the clamp to engage the car when the cradle tips, and other means for holding the clamp in engagement with the car when the car is inverted.

16. In a car dumper, the combination of a cradle adapted to be rolled, a platform therein adapted to support a car, a clamp for the car, means for holding the clamp in inactive position when the cradle is in normal position said means functioning to allow the clamp to engage the car when the cradle rolls, and a flexible member adapted to wrap about the car and hold the clamp thereagainst during subsequent rolling.

17. In a dump car, the combination of a cradle adapted to be rolled, a transversely movable platform therein adapted to support a car, a clamp on that side of the car toward which the cradle is rolled from its normal position to unload, mechanism for holding said clamp elevated and free from the car when the cradle is in normal position, said mechanism being adapted to re-

lease the clamp to enable it to drop by gravity into engagement with the car when the cradle is rolled, and a flexible member acting on the clamp and adapted to hold it in engagement with the car during subsequent rolling of the cradle.

18. In a car dumper, the combination of a cradle adapted to be rolled, a car supporting platform therein, an inclined support for the platform, a clamp for the car on that side of the cradle corresponding to the elevated side of the platform, mechanism for holding the clamp elevated when the cradle is in normal position, but adapted to release the clamp after the cradle has turned and the car has moved beneath the clamp, a clamping member for the opposite wall of the car pivoted to the clamp first mentioned and a cable adapted to wrap around the car and hold the clamp and clamping member in engagement therewith as the car is being inverted.

19. In a rolling car dumper, the combination of a pair of rings, longitudinal members connecting them, one of said members formed to constitute a counterweight, transverse supports extending from said counterweight and providing a track for the platform normally inclined upwardly from the counterweight, a car supporting platform on said track, and a clamping device for the car carried by the track on the opposite side of the platform from the counterweight.

20. A cradle for a rolling car dumper comprising a pair of ring members, longitudinal members connecting said rings, one of said members being composed of a pair of plates at an angle to each other and concrete in the angular space between said plates, said concrete constituting a counterweight tending to return the cradle to normal position.

In testimony whereof, I hereunto affix my signature.

JUSTIN GRIESS.