Feb. 20, 1951 R. L. GLOVER 2,542,660

ROTARY CAR DUMPER

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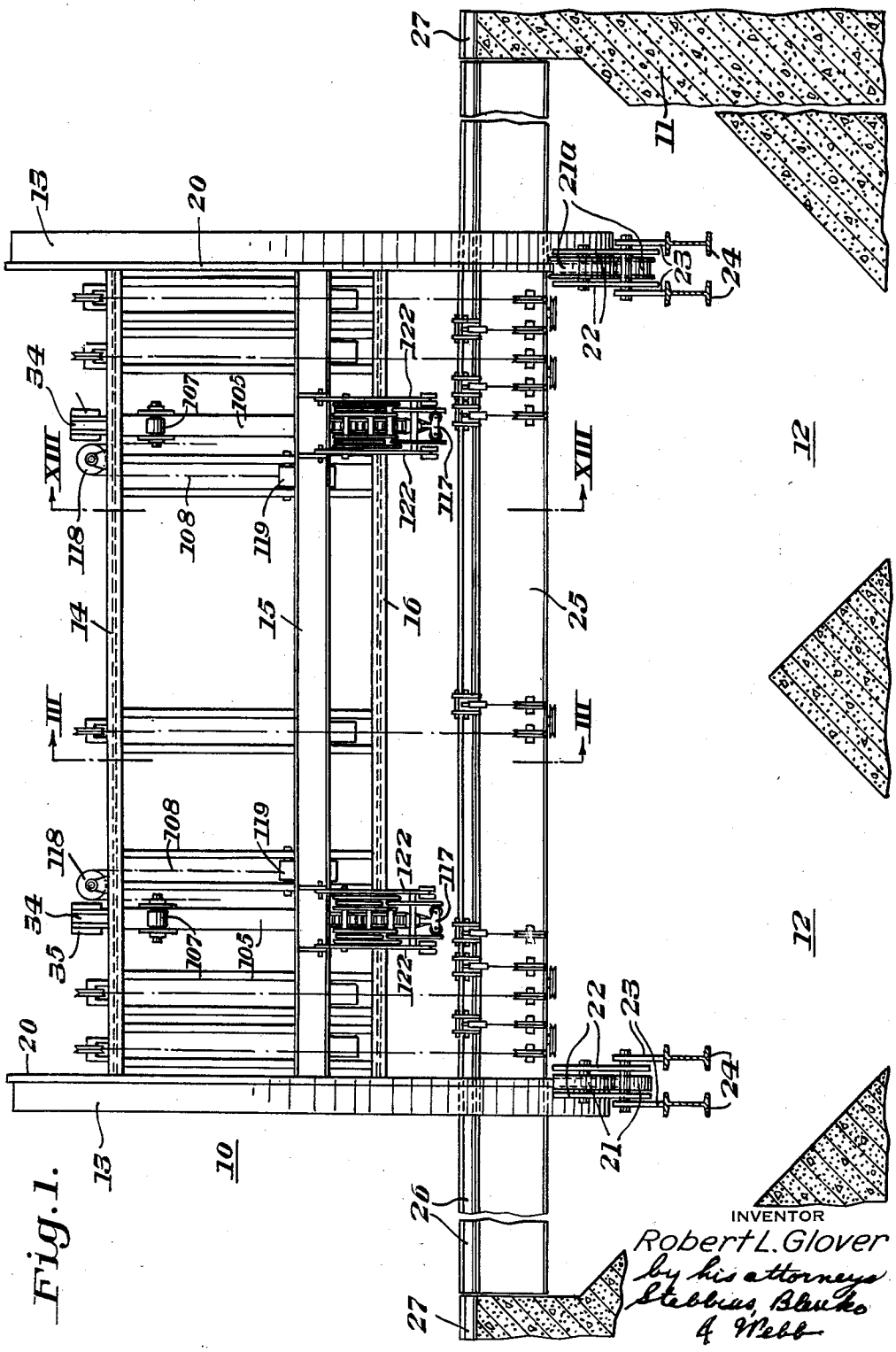


Fig. 1.

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ROTARY CAR DUMPER

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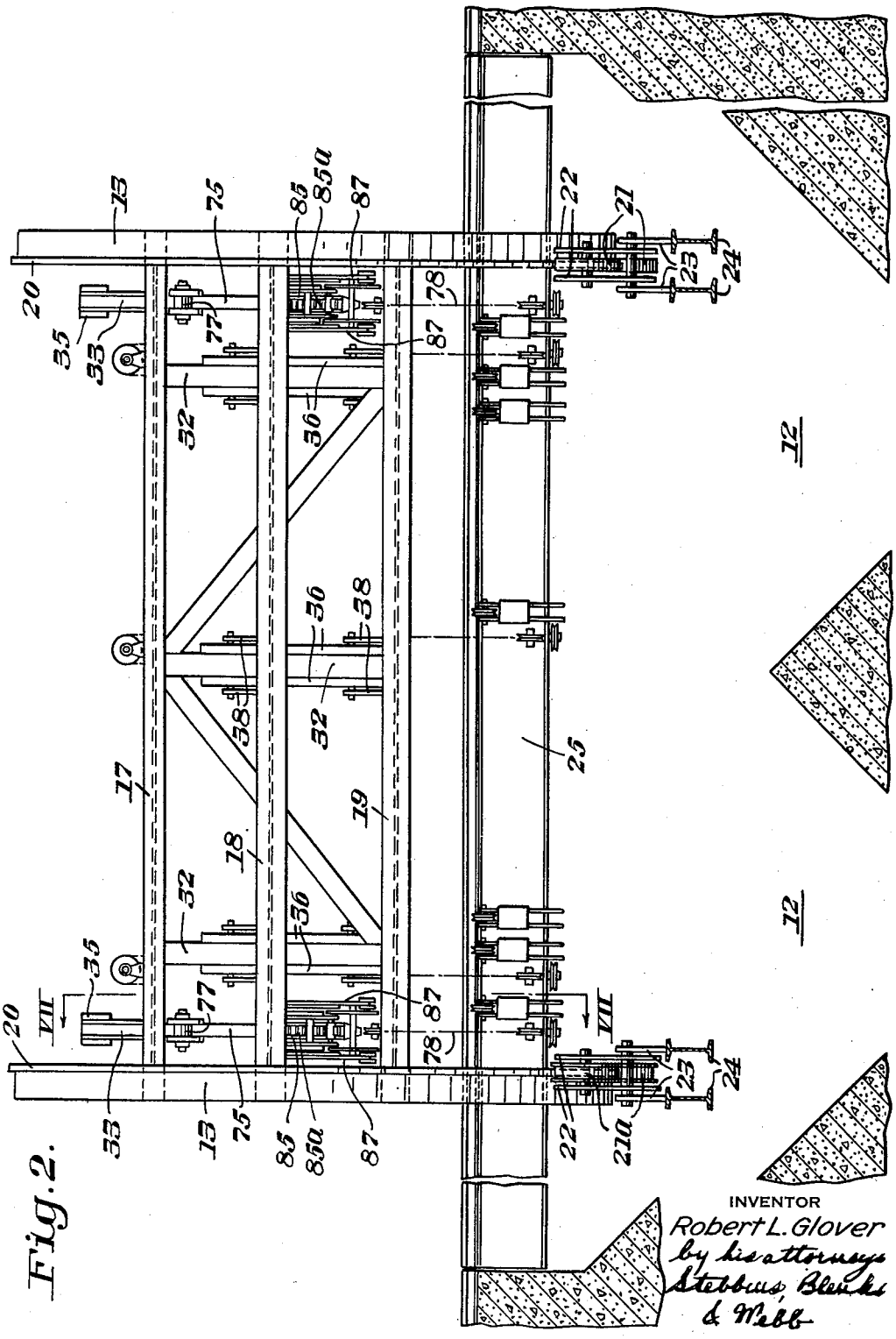


Fig. 2.

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ROTARY CAR DUMPER

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Fig. 3.

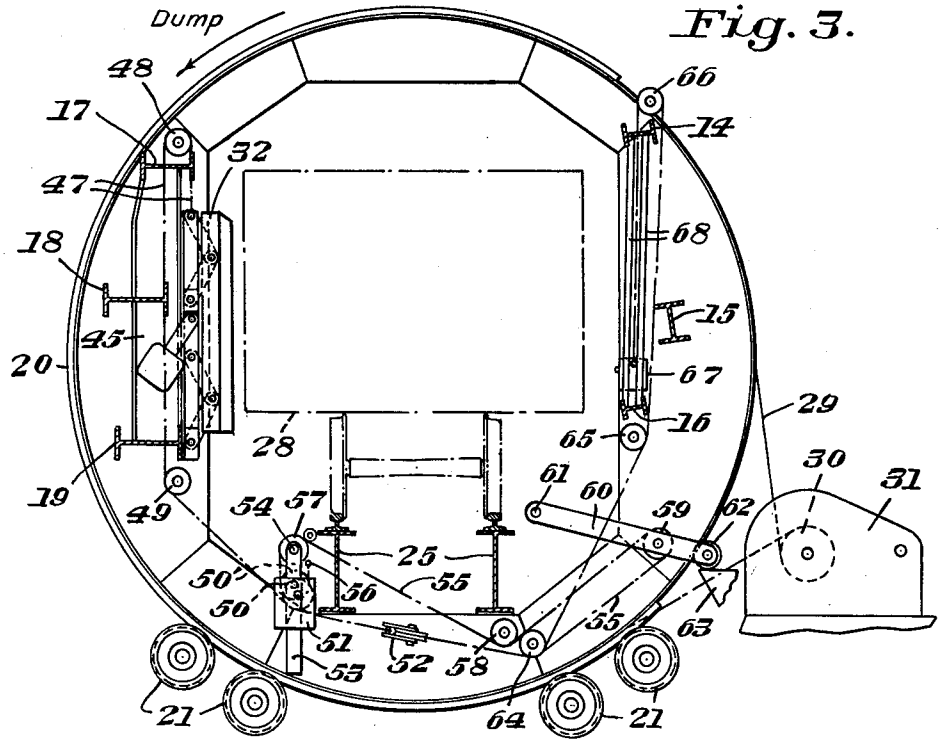
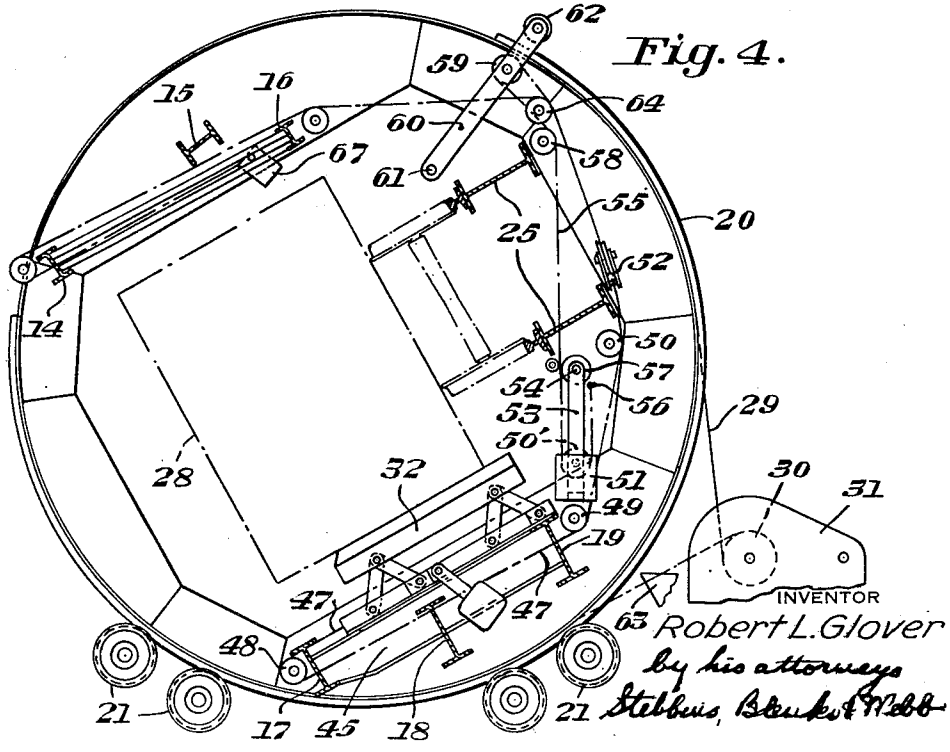


Fig. 4.



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ROTARY CAR DUMPER

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Fig. 5A.

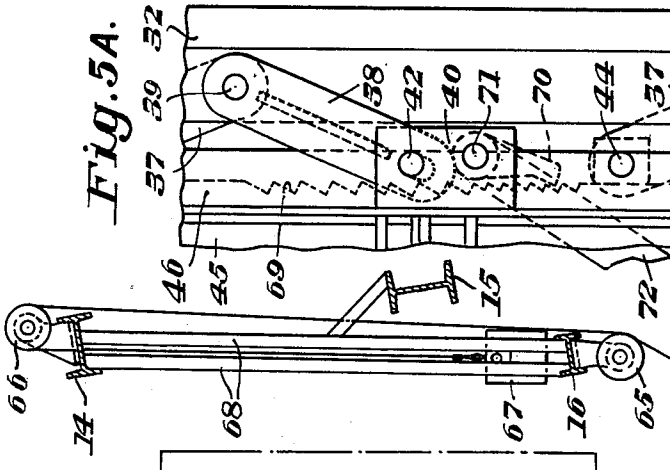
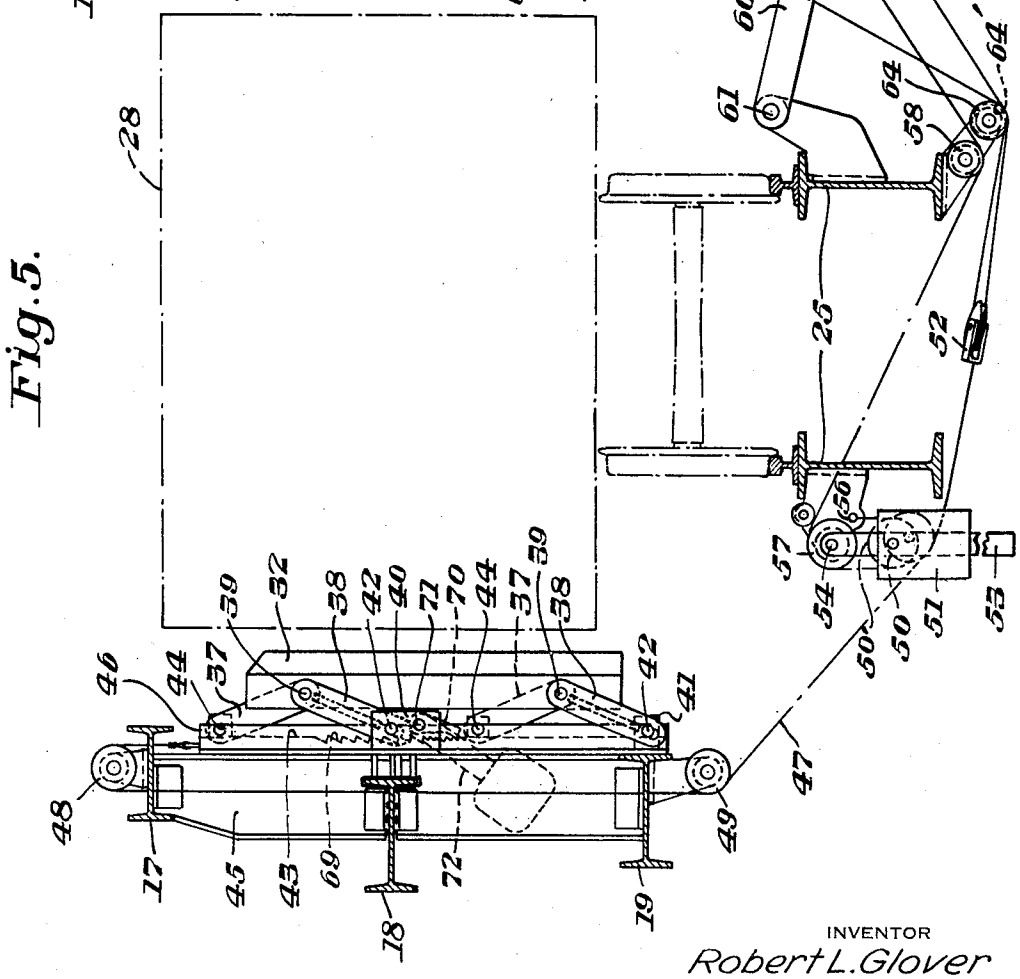


Fig. 5.



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ROTARY CAR DUMPER

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Fig. 6.

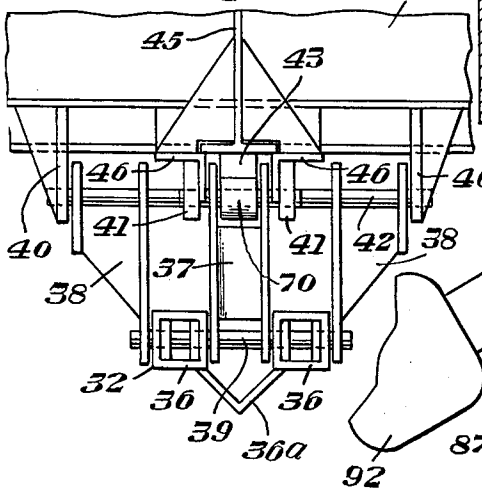
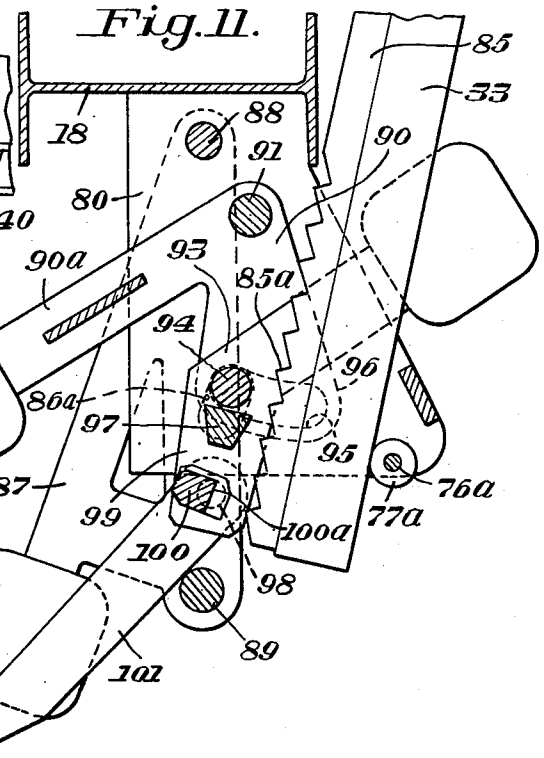


Fig. 11.



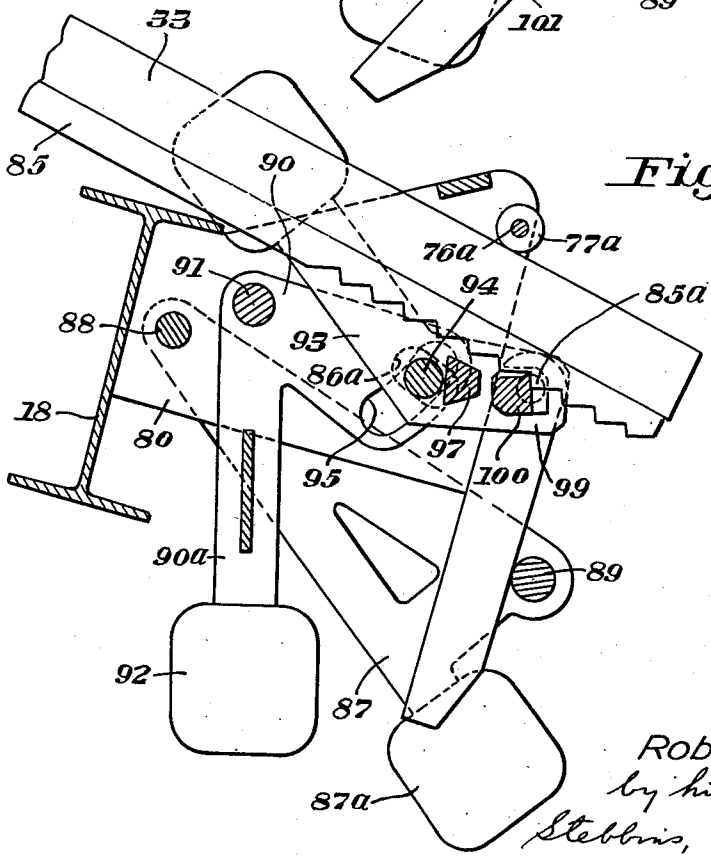


Fig. 12.

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ROTARY CAR DUMPER

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Fig. 7.

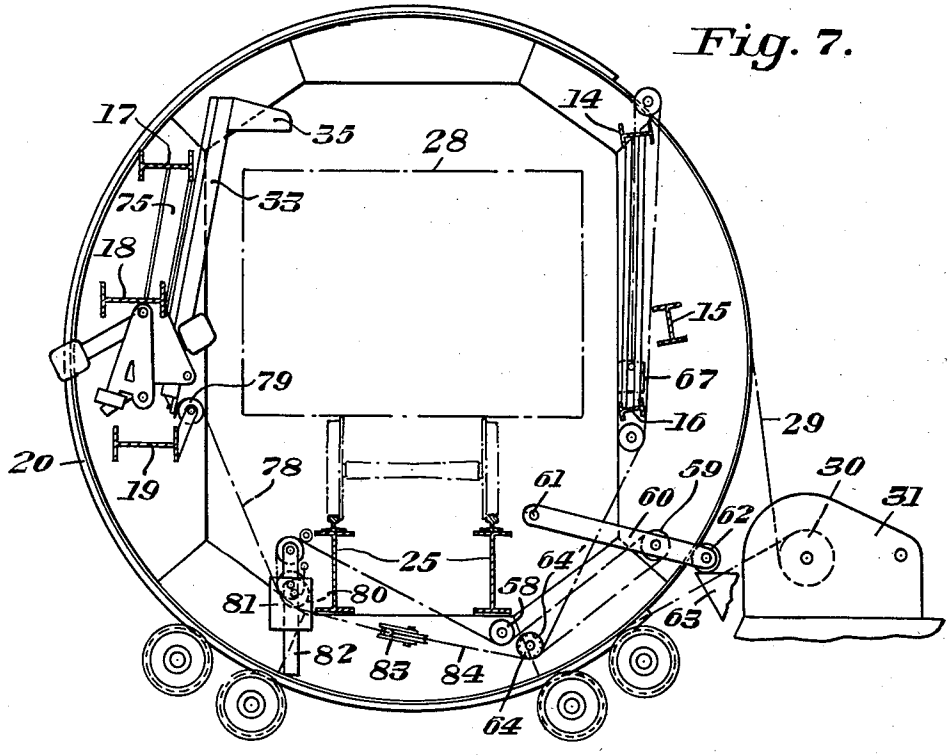
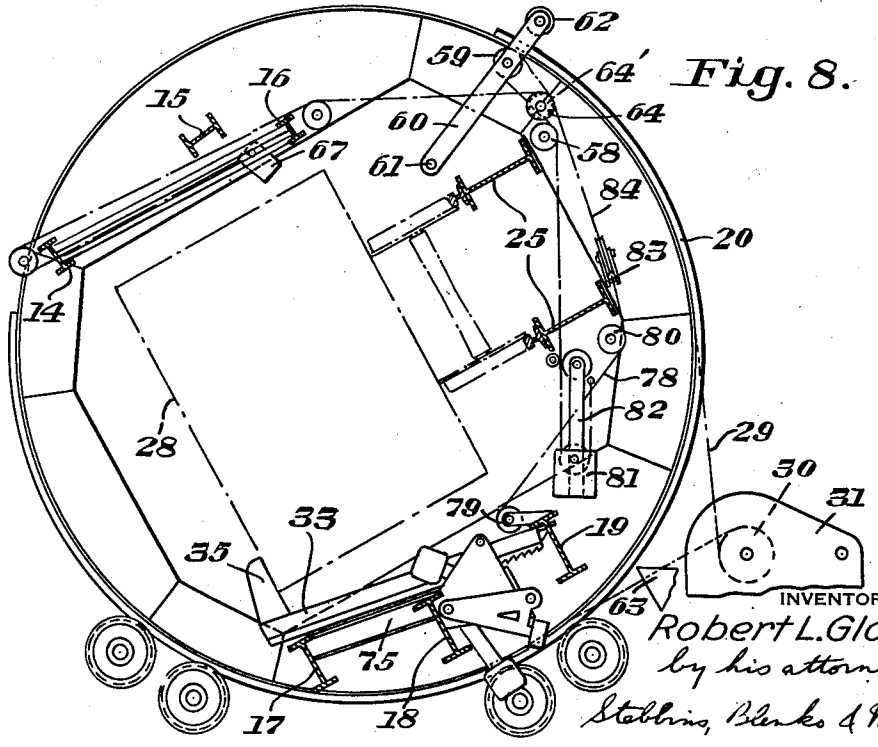


Fig. 8.



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ROTARY CAR DUMPER

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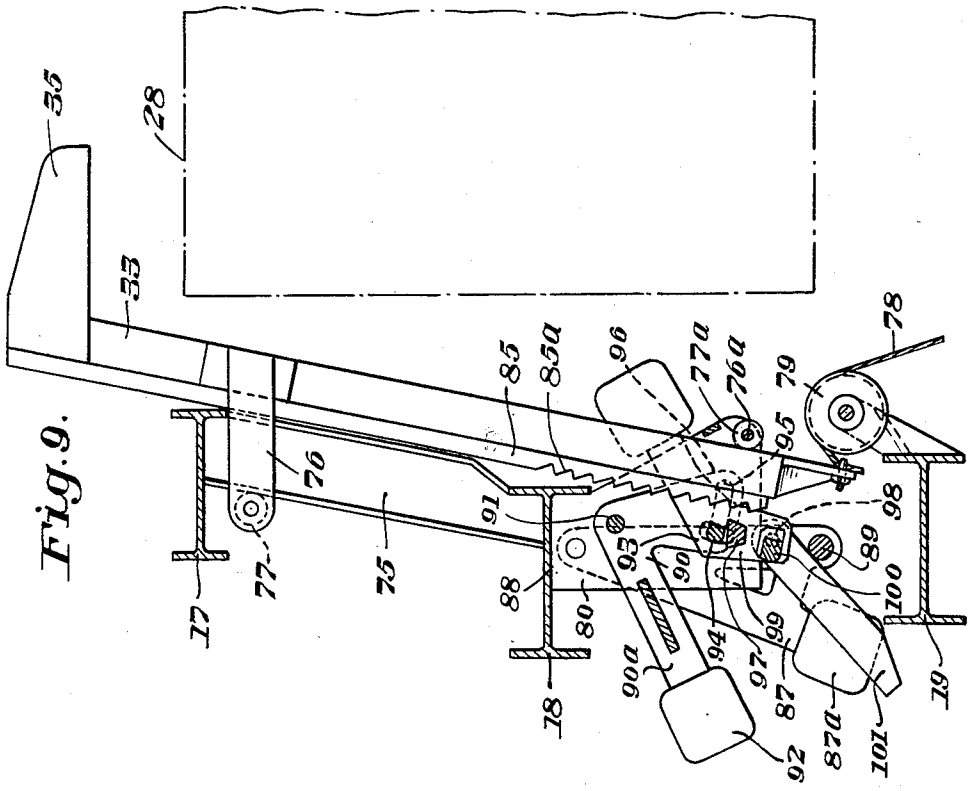


Fig. 9.

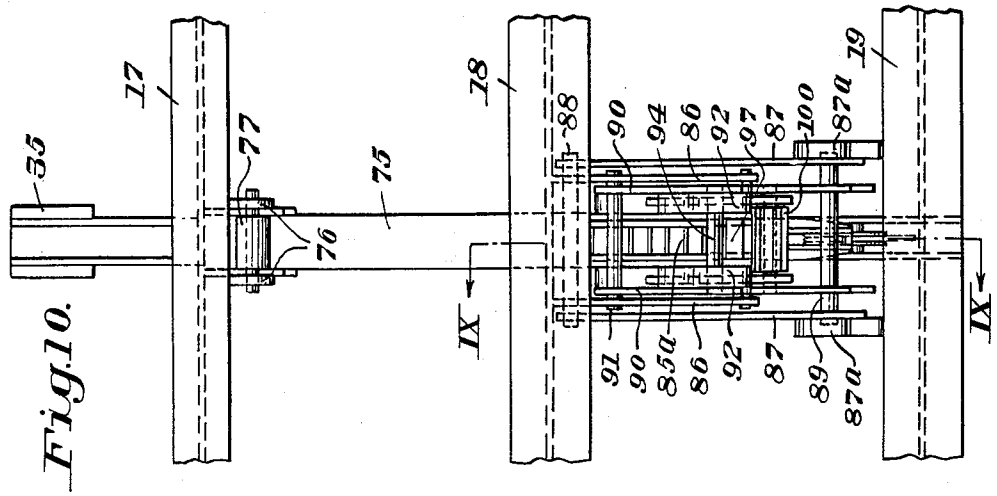


Fig. 10.

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ROTARY CAR DUMPER

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Fig. 13.

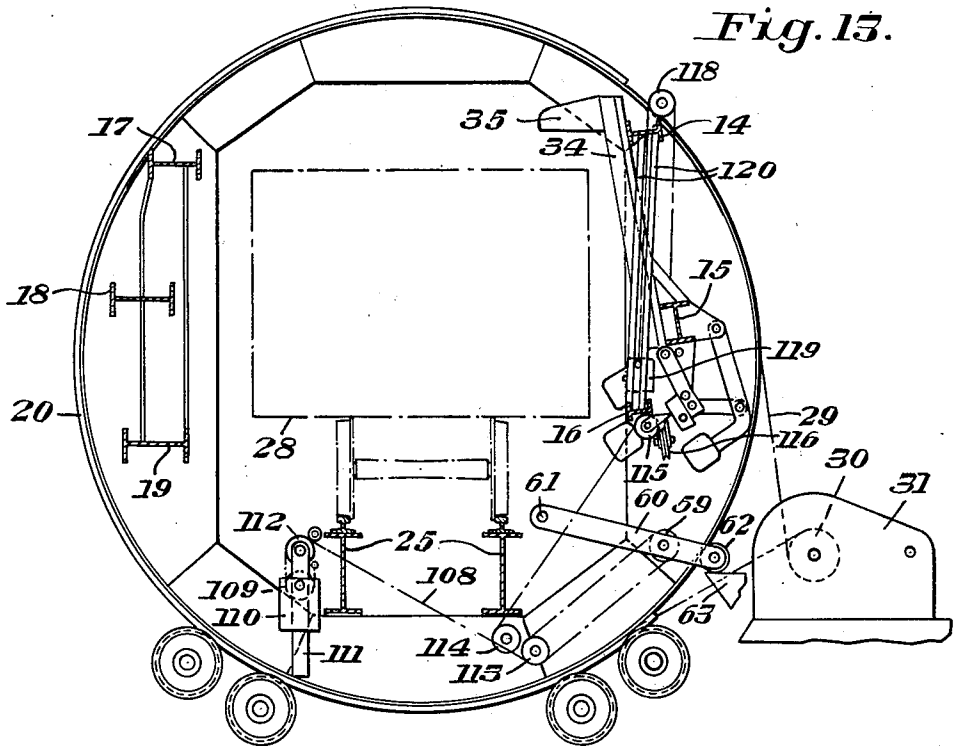
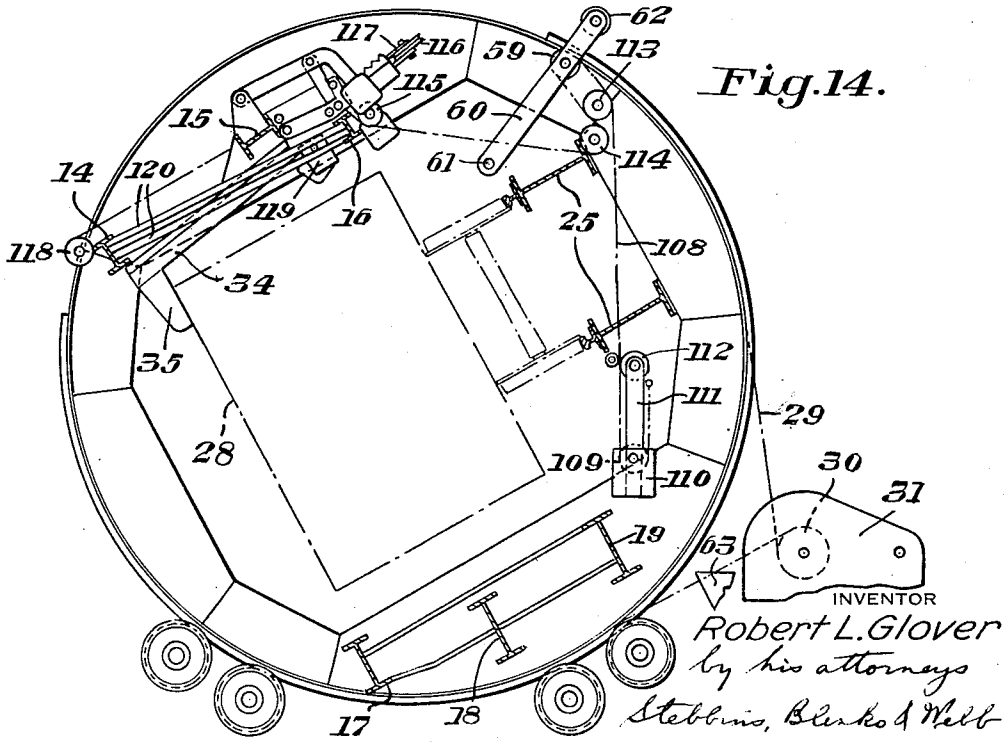


Fig. 14.



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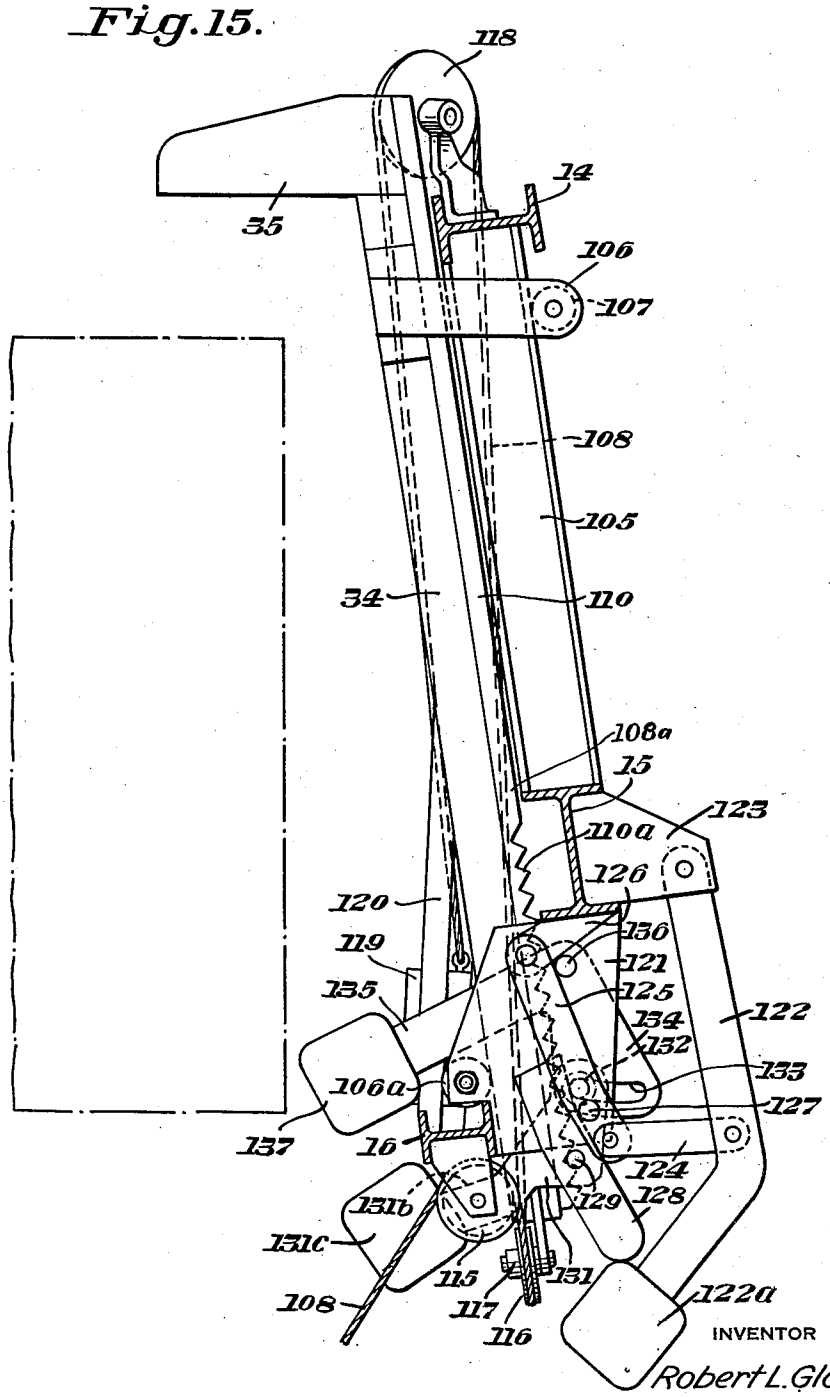
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ROTARY CAR DUMPER

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Fig. 15.



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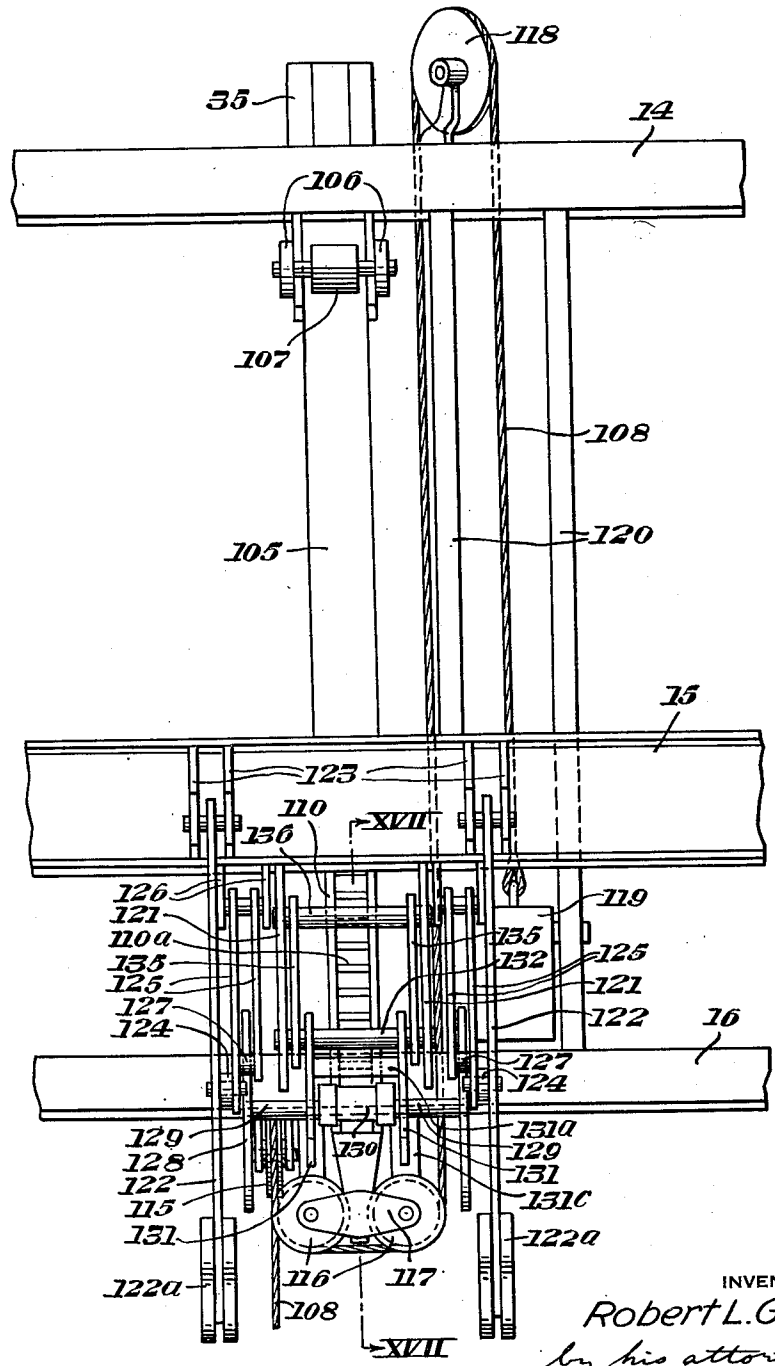
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Fig. 16.



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Stebbins, Blenko & Webb

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Fig.17.

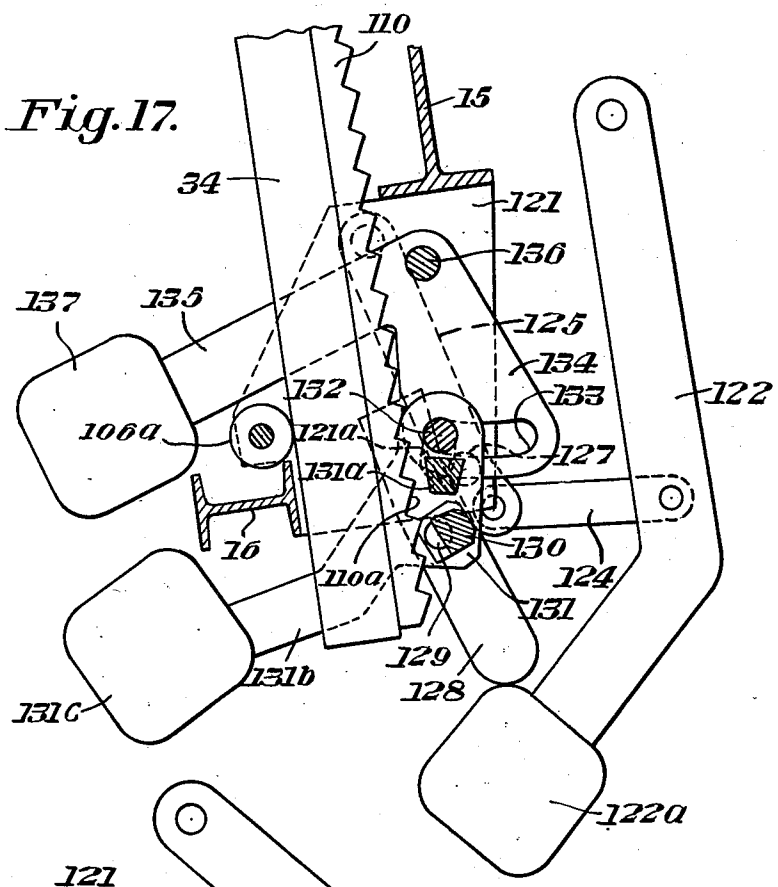
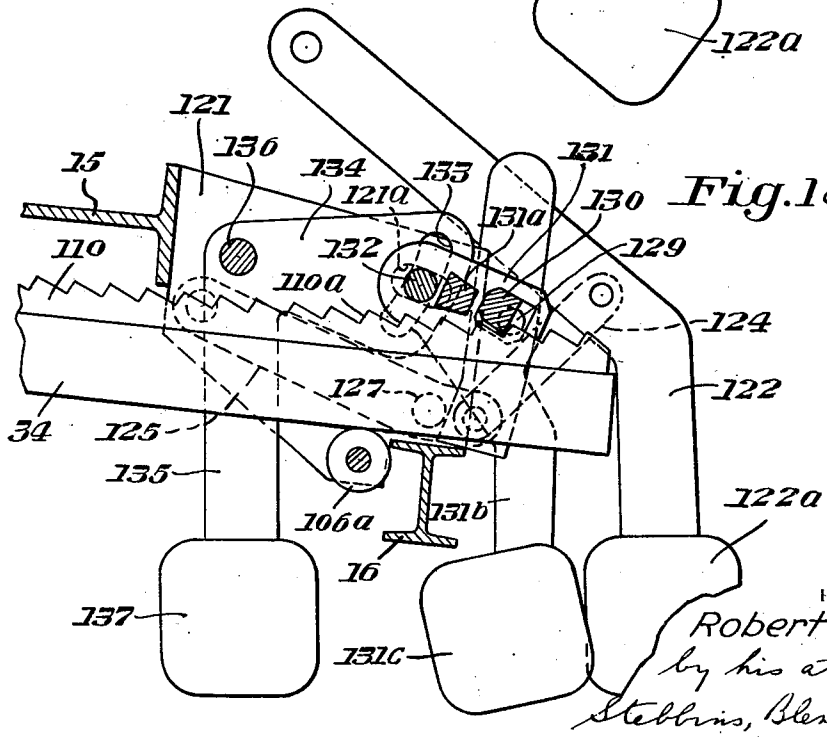


Fig.18.



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Patented Feb. 20, 1951

2,542,660

UNITED STATES PATENT OFFICE

2,542,660

ROTARY CAR DUMPER

Robert L. Glover, Poland, Ohio, assignor to The Car Dumper Corporation, Youngstown, Ohio, a corporation of Ohio

Application September 23, 1946, Serial No. 698,697

9 Claims. (Cl. 214—55)

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This invention relates to car dumpers and, in particular to dumpers of the rotary type, i. e., those having a car-receiving cradle mounted for rotation about its longitudinal axis whereby the car may be tilted sidewise for dumping.

Various forms of rotary car dumpers have been known heretofore and it is the general object of my invention to provide an improved dumper characterized by simplicity of construction and rapidity of operation. A further object is to provide a dumper having car clamps and side sills operating automatically to engage the top and one side of a car as the cradle starts to rotate, to hold the car in fixed position relative to the cradle while it is inverted. I thus insure proper clamping and side support of the cars regardless of variations in their height and width.

In a preferred embodiment, my invention comprises a rotary cradle including spaced rings connected by longitudinal frame members; car clamps on both sides and adjacent each end of the cradle; and side sills on the dumping side of the cradle spaced along the length thereof. Levers adapted to engage fixed abutments are pivoted to the cradle for operating the clamps and side sills through ropes reeved over guide sheaves. Other levers pivoted to the cradle and provided with counterweights actuate locking means for securing the clamps and side sills in engagement with the car. The locking means are automatically released when the car is righted, and the clamps are raised and the side sills withdrawn, permitting immediate replacement of the empty car with a loaded one.

The locking means for the car clamps becomes effective only after rotation of the cradle through a substantial angle, say 80°. In this position of the cradle, the car springs have been substantially relieved of the load of the car body and contents. This is necessary to facilitate disengagement of the clamp-locking means when the car is righted. I provide novel clamp-locking means including a toothed bar adapted to be engaged by a rocking dog to hold the clamp in car-engaging position when the cradle turns beyond the 80° position. On further rotation of the cradle, a counterweighted eccentric becomes effective to shift the dog to the extent necessary to cause it to bear tightly against the tooth of the bar which is nearest the face of the dog when the clamp is arrested by engagement with the side of the car. The car when clamped is thus tightly held on the cradle against movement as the cradle turns to dumping position and back. A similar toothed bar and pivoted dog serve to lock each of the side sills in extended position as soon as tilting of the cradle commences.

A complete understanding of the invention may be obtained from the following detailed description and explanation which refer to the accompanying drawings illustrating a present preferred embodiment. In the drawings,

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Figure 1 is a side elevation of my improved car dumper as viewed from the driving side;

Figure 2 is a side elevation thereof as viewed from the other or dumping side;

Figure 3 is a section taken along the plane of line III—III of Figure 1 showing the side sills, other parts being omitted for the sake of clearness;

Figure 4 is a section similar to Figure 3 showing the parts in dumping position;

Figure 5 is a partial section to enlarged scale, similar to Figure 3 but largely diagrammatic, showing the construction of the side sills in greater detail and the reeving of the ropes for operating them;

Figure 5A is a portion of Figure 5 to enlarged scale;

Figure 6 is a partial plan view showing one of the side sills and associated parts;

Figure 7 is a transverse section taken along the plane of line VII—VII of Figure 1 showing only one of the car clamps, viz., that on the dumping side;

Figure 8 is a view similar to Figure 7 showing the parts in dumping position;

Figure 9 shows the car clamp on the dumping side and the locking mechanism therefor to enlarged scale;

Figure 10 is a partial side elevation corresponding to Figure 9;

Figure 11 is a section taken along the plane of line XI—XI of Figure 10 showing the locking mechanism for the clamp on the dumping side to enlarged scale;

Figure 12 is a view similar to Figure 11 showing the parts in dumping position;

Figure 13 is a sectional view similar to Figure 7, taken along the plane of line XIII—XIII of Figure 1, showing the car clamp on the non-dumping side;

Figure 14 is a view similar to Figure 13 showing the parts in dumping position;

Figure 15 is a view similar to Figure 9 showing the clamp on the non-dumping side;

Figure 16 is a partial side elevation corresponding to Figure 15;

Figure 17 is a sectional view taken along the plane of line XVII—XVII of Figure 16 showing the locking means for the clamp on the non-dumping side to enlarged scale; and

Figure 18 is a view similar to Figure 17 showing the parts in dumping position.

Referring in detail to the drawings, the car dumper of my invention comprises a cradle 10 adapted to be mounted on a foundation 11 in which are formed pockets or hoppers 12 for receiving the material dumped from gondola or hopper-bottom cars.

Cradle construction

The cradle 10 comprises end rings 13 connected by longitudinal frame members 14, 15 and 16 on the non-dumping side and similar members 17, 18 and 19 on the dumping side. The rings 13 are of box section and are fabricated from plate. They are provided with bearing tracks 20 which engage supporting wheels 21 and 21*a*. The wheels 21 and 21*a* are journaled in pairs between spaced plates 22 pivotally mounted on bearings 23. The bearings 23 are supported by cross beams 24 embedded in the foundation 11. The wheels 21*a* have flanges which prevent axial movement of the cradle. Longitudinal beams 25 extending between and beyond the rings 13 carry a movable rail section 26 adapted to be alined with fixed rails 27 on the foundation whereby railroad cars such as indicated at 28 may be entered into the cradle for dumping and removed therefrom. The cradle is rotated from its normal position shown in Figures 1, 2 and 3 to dumping position shown in Figure 4 by a rope 29 extending partway around one of the rings 13 and around a drum 30 driven by a motor and gear-reducer indicated at 31. In all the figures of the drawings, the direction of rotation of the cradle to dump a car is counterclockwise, as indicated by the arrow in Figure 3.

Vertically extending side sills 32 are mounted in spaced relation on the dumping side of the cradle for movement into engagement with the side of a car in the cradle to prevent lateral shifting of the latter as the cradle turns. Vertically reciprocable car clamps 33 are mounted adjacent the rings 13 on the dumping side of the cradle and similar clamps 34 are mounted on the other side of the cradle at points spaced inwardly from the clamps 33. The side sills and clamps are operated automatically by counterweights, levers and rope rigging to be described in detail shortly, in such manner that, when a car has been disposed within the cradle and the cradle started turning toward dumping position, the side sills first move into engagement with the dumping side of the car and are locked in extended position. After the cradle has rotated through an angle, say 80°, such that the car springs have been substantially relieved from the load of the weight of the car body and contents, the car clamps descend until their overhanging hook portions 35 engage the upper edges of the sides of the car. The clamps are then locked in this position to hold the car firmly fixed relative to the cradle during continued rotation thereof to final dumping position. On reverse rotation of the cradle, the clamps are unlocked and raised automatically before the cradle returns to normal or starting position and the side sills are retracted as the return rotation is completed, thus freeing the car for removal and replacement by a loaded car.

Side sills and mechanism for operating and locking them

The details of the construction of the side sills 32 are shown in Figures 5 and 6. As there illustrated, each sill 32 comprises a pair of parallel beams 36 having an angle 36*a* welded thereto and adapted to bear against one side of the car. The beams 36 are mounted on the common pivots 39 of upper and lower sets of toggle links 37 and 38. The links 38 of the two sets are pivoted to fixed bearings 40 and 41 on pins 42 secured to the longitudinal members of the cradle 18 and 19.

The links 37 of the two sets are pivoted to a vertically slidable ratchet bar 43 by pins 44. The bar 43 slides up and down along a cross beam 45 extending between the upper and lower longitudinal members 17 and 19. Angles 46 secured to the cross beam confine the bar 43 laterally. It will be apparent that when the bar 43 is permitted to descend between the angles 46, the sets of toggle links will advance the parallel beams 36 until the angle 36*a* strikes the side of the car or until the toggle links have been fully extended. Conversely, when the bar 43 is pulled up, the beams 36 will be retracted.

When the cradle is in normal position, the bar 43 is held in its uppermost position as shown in Figure 5, by a rope 47 secured thereto. This rope is trained over a sheave 48 mounted on the upper longitudinal beam 17 and extends thence downwardly around a guide sheave 49 mounted on the lower longitudinal beam 19. The rope then extends around a sheave 50 to a sheave block 52.

A counterweight 51 slides on an arm 53 which is pivoted at 54 to one of the longitudinal beams 25. A rope 55 dead ended on the cradle at 56 is trained around a sheave 50′ on the counterweight 51. The rope then extends around a sheave 57 on the pivot 54 of the arm 53. From sheave 57 the rope extends to a sheave 58 journaled on one of the beams 25 and thence around a sheave 59 journaled on a tilting lever 60. The lever 60 is pivoted to the cradle at 61 and has a roller 62 at its outer end adapted to engage a fixed abutment 63. From the sheave 59, the rope 55 extends around a guide sheave 64, around the sheave of block 52, thence around a second guide sheave 64′ coaxial with the sheave 64. Both these sheaves are mounted on the cradle. The rope then extends upwardly around a guide sheave 65 on the cradle and around a sheave 66 mounted on the longitudinal member 14 of the cradle. From the sheave 66, the rope extends downwardly to a counterweight 67 slidable between vertical guide rails 68 extending between cradle beams 14 and 16.

It will be apparent form Figure 5 that, when the cradle starts to tilt, the lever 60 turns clockwise about its pivot 61, slacking the rope 55. This permits the block 52 to move to the left, lowering the bar 43. This causes the toggle links 37 and 38 to be extended and the beams 36 of the side sill to advance the angle 36*a* into engagement with the side of the car. After the sills have thus become seated against the car, further slacking of the rope 55 is taken up by counterweight 51 until the lever 60 reaches the limit of its tilting movement as shown in Figure 4. This may conveniently be a fixed mechanical stop (not shown). The weight of the beams 36 of the side sill and the bar 43 is much greater than that of the counterweight 51 so the latter will not start to descend until the sills have engaged the side of the car.

The bar 43 has its inner face toothed as at 69. A detent or pawl 70 is fixed to a shaft 71 pivoted in fixed bearings 40. A counterweight lever 72 is also secured to the shaft 71. When the cradle is in the normal position, the lever 72 tends to hold the detent away from the teeth 69. After the cradle has tilted through a small angle (about 30°), however, the lever 72 swings clockwise and forces the detent into engagement with one of the teeth, thus locking the bar 43 against upward movement and preventing retraction of the side sills. It will be noted that

there are two groups of teeth of different sizes, the upper group of teeth being larger or coarser than the lower group. This permits satisfactory locking of the sills, both in the initial portion of their travel in which the vertical movement of the bar 43 is relatively slight as well as in the latter portion of the travel of the sills in which a considerable collapsing of the toggle links is necessary to extend the sills a given amount.

When the cradle is returned to normal position, the reverse swinging of lever 72 causes detent 70 to disengage the toothed surface of the bar 43. When the roller 62 on the lever 60 strikes the abutment 63, the resulting counterclockwise movement of the lever causes the rope 55 to be taken up. The first result thereof is that the counterweight 51 is raised to the limit of its movement after which the rope 47 is taken up to raise the bar 43 and retract the side sill. The counterweight 67 is heavy enough to overcome the weight of the side sill on the rope 47, considering that the former operates on a two-part line while the weight of the side sill and its operating bar are effective through a single-part line. The counterweight 67 thus does not ordinarily have much movement but prevents overstressing of either of the ropes in case the moving parts should be blocked by any obstruction.

Car clamps on dumping side and mechanism for operating and locking them

The car clamps 33 and 34 on opposite sides of the cradle hold the car in place as the cradle rotates. The construction and operation of the clamps 33 will be explained by reference to Figures 7 through 12 showing a single clamp and its operating and locking mechanism. The clamp 33 slides up and down along a cross beam 75 extending between longitudinal members 17 and 18. A bracket 76 extending outwardly from the shank of the clamp carries a roller 77 which rides on the outer flange of the beam 75. The clamp is normally held in elevated position by a rope 78 secured to the lower end thereof and reeved in about the same manner as the rope 47 which operates the side sills. The rope passes over a guide sheave 79, thence under a sheave 80. The end of the rope 78 is secured to a block 83. A rope 84 passing through the block 83 is reeved in exactly the same manner as the rope 55 and it is unnecessary, therefore, to repeat the detailed description thereof. The various parts are designated by the same reference numerals used in Figure 5.

It will be evident that, when the cradle is in normal position, as shown in Figure 7, the counterweight 67 acting on the rope 84 and, through block 83 on rope 78, holds the clamp in its uppermost position. As soon as the cradle starts to turn, the movement of the lever 60 permits the counterweight 67 to descend to the bottom of its path. Thereafter, further slacking of the rope 84 permits the clamp 33 to descend until the hook portion 35 engages the upper edge of the side of the car. Further slacking of the rope 84 is taken up by movement of a counterweight 81. The counterweight is slidable on an arm 82 pivoted to the cradle.

The clamp 33 is provided with a toothed or ratchet bar 85 adapted to be engaged by a locking detent or pawl after the cradle has been turned through a sufficient angle, say 80°, to relieve the car springs of the weight of the car body and contents. The locking mechanism is supported on spaced plates 86 secured to the longitudinal member 18 and extending downwardly therefrom. A shaft 76*a* extending between the plates 86 across the inner face of the clamp shank is provided with a roller 77*a* against which the clamp bears. Downwardly extending levers 87 having counterweights 87*a* thereon are pivoted to the plates 86 on a through pin 88 and are connected by a pin 89 rotatable in bearings carried by the levers. Bell cranks 90 are pivoted on the plates 86 on a pin 91 and have counterweights 92 on an arm 90*a*. Upwardly extending levers 93 are pivoted to the plates 86 on a pin 94. The pin 94 passes through eccentric slots 95 in arms 96 of the bell cranks 90. The plates 86 have slots 86*a* generally parallel to the shank of the clamp 33 to permit movement of the pin 94 on rotation of the bell crank 90. The curvature of the slots 95 is such as to force the pin 94 downwardly on clockwise rotation of the arms 96.

A cross bar 97 extends between and is secured to the lever 93 and ties them rigidly together. A shaft 98 is journaled in downwardly projecting arms 99 of the levers 93 and has a detent or pawl 100 formed intermediate the latter for engagement with one of the teeth of the bar 85. The detent has a face 100*a* adapted to engage one of the tooth faces 85*a*. Levers 101 secured to the shaft 98 are adapted to turn the latter so that the detent is brought into position for engaging a tooth when the levers 93 pass dead center. The levers 101 normally bear against the pin 89 and are thus actuated when the levers 87 swing outwardly.

It will be apparent from the foregoing description that, as the cradle turns, the first operation will be the lowering of the clamp as above explained. Next, the counterweights on the levers 87 cause them to move clockwise, thereby lifting the levers 101 and turning the detent 100 into locking position. The detent does not engage a tooth on the bar 85, however, until the cradle has turned through a sufficient angle, say 80°, to cause the counterweights 92 on the levers 93 to pass dead center. This throws the detent into engagement with the toothed portion of the bar 85. Locking of the clamps is thus deferred until the car springs have been relieved of their load. The face 101*a* of the detent will not come against the face 85*a* of the tooth, except perhaps fortuitously. This engagement is obtained, however, on further turning of the cradle such as to cause the bell cranks 90 to turn clockwise. The eccentric slots 95 thereof move the pin 94 downwardly in its slots 86*a* in the side plates 86 carrying the levers 93 and the detent 100 with it, until the lower face of the detent firmly engages a tooth face 85*a*.

When the cradle has been turned to the position shown in Figure 8, the clamps 33 hold the car tightly. The mechanical advantage of the linkage including the detent 100, the pin 94 and the slots 95 in the levers 96 is such that the counterweights 92 need not be excessively heavy in order, with the aid of the friction in the moving parts, to prevent releasing movement of the clamps.

On reversal of the cradle, the levers 90 first return to normal, relieving the holding pressure of the detent on the tooth of the bar 85. Thereafter, the levers 93 swing back moving the detent bodily away from the bar and finally the plates 87 swing toward the clamp permitting the levers 101 to swing downwardly and turn the detent into releasing position. After the clamp has thus been fully unlocked, the engagement of roller 62 with

abutment 63 takes up the ropes 84 and 78, thereby lifting the clamp and freeing the car for removal.

Car clamps on driving side and mechanism for operating and locking them

The clamps 34 on the driving side of the car and the locking mechanism thereof are generally similar to the clamps 33 and their locking mechanism, as shown in Figures 13 through 18. Each clamp 34 slides on a cross beam 105 extending between the longitudinal members 14 and 15. Arms 106 extending outwardly from the shank of the clamp have a roller 107 journaled therein which rides on the outer flange of the beam 105. A bar 108a on the clamp shank has teeth formed in a portion thereof for engagement by a locking detent.

The clamp 34 is normally held in uplifted position by a rope 108, reeved somewhat similar to the rope 84 for operating clamp 33. The rope 108 is dead-ended on the cradle at one end and extends around a sheave 109 on a counterweight 110 sliding on an arm 111 pivoted to the cradle. The rope then extends around a sheave 112 turning on the pivotal axis of the arm 111 and thence around a sheave 113 on the cradle and a sheave 59 on an arm 60 pivoted to the cradle. Thence the rope extends around a guide sheave 114 on the cradle and a sheave 115 mounted on the longitudinal member 16. The rope then travels around a pair of sheaves 116 journaled on brackets 117 secured to the lower end of the clamp 34. The rope then extends upwardly around a sheave 118 mounted on the longitudinal member 14 and thence downwardly to a counterweight 119 traveling between guides 120.

As in the case of the clamps 33, the clamps 35 are held in their uplifted position by the counterweights 119. When the cradle starts to turn, movement of the arm 60 slacks the rope 108, permitting the counterweight 119 to drop to the bottom of its path, after which further slackening of the rope permits the clamp 34 to descend until its hook portion 35 engages the upper edge of the side of the car. Thereafter, the counterweight 110 takes up any further slack created in the rope 108 until the lever 60 reaches its limit of movement.

Referring now more particularly to Figures 15 through 18, the clamp-locking mechanism is mounted on a pair of spaced side plates 121 secured to the longitudinal member 15 and depending therefrom. A roller 106a journaled in these plates engages the inner face of the shank of the clamp. Downwardly extending levers 122 having counterweights 122a are pivoted to brackets 123 secured to the longitudinal member 15. Each lever 122 is connected by a link 124 to one of a pair of links 125 pivoted to brackets 126 secured to the longitudinal member 15 and spaced outwardly from the plates 121. Rollers 127 journaled between each pair of links 125 operate levers 128 secured to a shaft 129 having a detent 130 adapted to engage the teeth on the bar 108a. The shaft 129 is journaled in downwardly and laterally extending levers 131 pivoted on a pin 132. The levers 131 are connected by a cross bar 131a and have portions 131b provided with counterweights 131c. The ends of the pin 132 extend through slots 121a in the side plates 121 parallel to the clamp shank and also through eccentric slots 133 in the arms 134 of bell cranks 135 having counterweights 137. The bell cranks 135 are pivoted to the side plates 121 on a pin 136.

The operation of the locking mechanism for the clamps 34 is generally similar to that of the corresponding mechanism for the clamps 33. Referring to Figures 13 and 14, it will be noted that, as the cradle turns counterclockwise, the clamp 34 descends into engagement with the upper edge of the side of the car as explained above. After the cradle has turned through a small angle, the counterweights 122a become effective to swing the levers 122 clockwise. This causes the links 125 to swing clockwise and the resulting movement of the pins 127 tilts the levers 128 counterclockwise, thereby turning the face 130a of the detent 130 into position for engaging the face 110a of one of the teeth on the bar 108a. After continued rotation of the cradle through an angle of about 80° sufficient to relieve the car springs of their load, levers 131 are tilted clockwise by their counterweights 131c. This moves the detent 130 bodily toward the toothed bar 110. The face 130a of the detent will not firmly engage a cooperating tooth face 110a, except perhaps fortuitously. Further rotation of the cradle, however, swings the bell cranks 135 clockwise and the eccentricity of the slots 133 therein forces the pin 132 downwardly in the slots 121a in the plates 121, thereby bringing the face 130a of the detent into firm engagement with the tooth face 110a.

It will thus be apparent that the clamps 34 are automatically caused to engage the car and lock only after the cradle has turned through an angle of about 80°. The clamps move upwardly a few inches as the car springs expand and the clamps are therefore under little or no tension when the cradle returns to normal position and may easily be unlocked and raised. In the reverse rotation of the cradle, the bell cranks 135 first release the detent 130 from engagement with the face of a tooth on the bar 108a. Thereafter, the levers 131 move the detent bodily away from the bar 108a and then the levers 122 swing the links 125 outwardly permitting the levers 128 to turn the detent 130 back to the position in which it is shown in Figure 17. Next, the engagement of the roller 62 with abutment 63 causes the lever 60 to take up on the rope 108. This first lifts the counterweight 110 to the limit of its movement, then raises the clamp 34 and finally lifts the counterweight 119 slightly above the bottom of its track.

It will be evident from the foregoing that the invention provides a car dumper having clamps and side supports characterized by numerous advantages over similar structures known previously. The car clamps are effective to engage the sides of the car despite variations in height and hold it firmly to the cradle on rotation thereof. The clamps are positively locked by mechanical means so that the car is safely held even of the contents be frozen. While counterweights are employed for tensioning cables and actuating the locking pawls, they are not relied on to exert the holding force. The side supports are also held in operative position by mechanical locking means against any possibility of yielding until the dumper is righted. The clamps and side sills are wholly automatic, their operation being controlled solely by rotation of the cradle. The counterweight levers for operating the locking mechanism are simple, effective and not likely to get out of order, so that proper operation is practically assured at all times.

Although I have illustrated and described but a preferred embodiment of the invention, it will be recognized that changes in the details of the construction disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and having side sills mounted on one side of the cradle adapted to move inwardly into engagement with a side of a car in the cradle, the improvement in means for moving the sills comprising toggle links connected to the sills and to the cradle, a lever pivoted adjacent one end and rotated about its pivot by rotation of the cradle, and means operatively connecting the free end of the lever to the toggle links whereby rotation of the lever causes movement of said toggle links to move the sills against the car.

2. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and having side sills mounted on one side of the cradle adapted to move inwardly into engagement with a side of a car in the cradle, the improvement in means for moving the sills comprising toggle links pivotally connected to the sills and to a vertically slidable bar whereby lowering the bar moves the sills towards the car, and means for holding the bar in its uppermost position when the cradle is at rest and allowing the bar to move downwardly upon rotation of the cradle.

3. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and having side sills mounted on one side of the cradle adapted to move inwardly into engagement with a side of a car in the cradle, the improvement in means for moving the sills comprising toggle links pivotally connected to the sills and to a vertically slidable bar whereby lowering the bar moves the sills towards the car, a lever pivoted adjacent one end and rotated about its pivot by rotation of the cradle and a cable secured to the bar and operatively connected to the lever whereby rotation of the lever creates slack in the cable and permits lowering of the bar.

4. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and having side sills mounted on one side of the cradle adapted to move inwardly into engagement with a side of a car in the cradle, the improvement in means for moving the sills comprising toggle links pivotally connected to the sills and to a vertically slidable bar whereby lowering the bar moves the sills towards the car, means for holding the bar in its uppermost position when the cradle is at rest and allowing the bar to move downwardly upon rotation of the cradle, ratchet teeth on the bar, and a pawl actuated by rotation of the cradle to engage the ratchet teeth and to restrain upward movement of the bar during dumping movement of the cradle.

5. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and having side sills mounted on one side of the cradle adapted to move inwardly into engagement with a side of a car in the cradle, and means for moving the sills, the improvement comprising a lever pivoted adjacent one end and rotated about its pivot by rotation of the cradle, a cable operatively connected to the sill moving means and to a counterweight, said cable also being operatively connected to the lever whereby rotation of the lever releases the cable and initiates operation of the sill moving means.

6. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and a clamp for holding the car on the cradle, the improvement in means for locking the clamp including a toothed bar on the clamp, a rotatable and shiftable detent for engaging the bar, counterweight means for turning the detent into bar-holding position, counterweight means for shifting the detent toward the bar, and counterweight means for shifting the detent along the bar until it firmly engages the face of a tooth, said counterweight means operating successively as the cradle rotates to dump a car therein.

7. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and a clamp for holding the car on the cradle, the improvement in means for locking the clamp including a toothed bar on the clamp, a rotatable and shiftable detent for engaging the bar, a lever for turning said detent into bar-holding position, a counterweight lever for actuating said first mentioned lever, and a counterweight lever on which said detent is journaled for shifting said detent toward said bar, said counterweight levers operating successively as the cradle rotates to dump a car therein.

8. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and a clamp for holding the car on the cradle, the improvement in means for locking the clamp including a toothed bar on the clamp, a rotatable and shiftable detent for engaging the bar, a lever for turning said detent into bar-holding position, a counterweight lever for actuating said first mentioned lever, and a counterweight lever on which said detent is journaled for shifting said detent toward said bar, counterweight bell cranks pivotally mounting said lever in which the detent is journaled, said bell cranks having eccentric means effective on swinging of the bell cranks to shift said lever and the detent until the detent firmly engages the face of a tooth of said bar, said counterweight levers and bell cranks operating successively as the cradle rotates to dump a car therein.

9. In a rotary car dumper having a cradle adapted to receive a car and rotate about its own longitudinal axis and a clamp for holding the car on the cradle, the improvement in means for locking the clamp including a toothed bar, a detent having a cut-out portion adapted to extend around the teeth of the bar and a tooth engaging face adapted to engage a tooth of the bar upon rotation of the detent, and counterweight means operating successively on rotation of the cradle for turning the detent into holding position, shifting it toward the bar and forcing it against a tooth thereof.

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