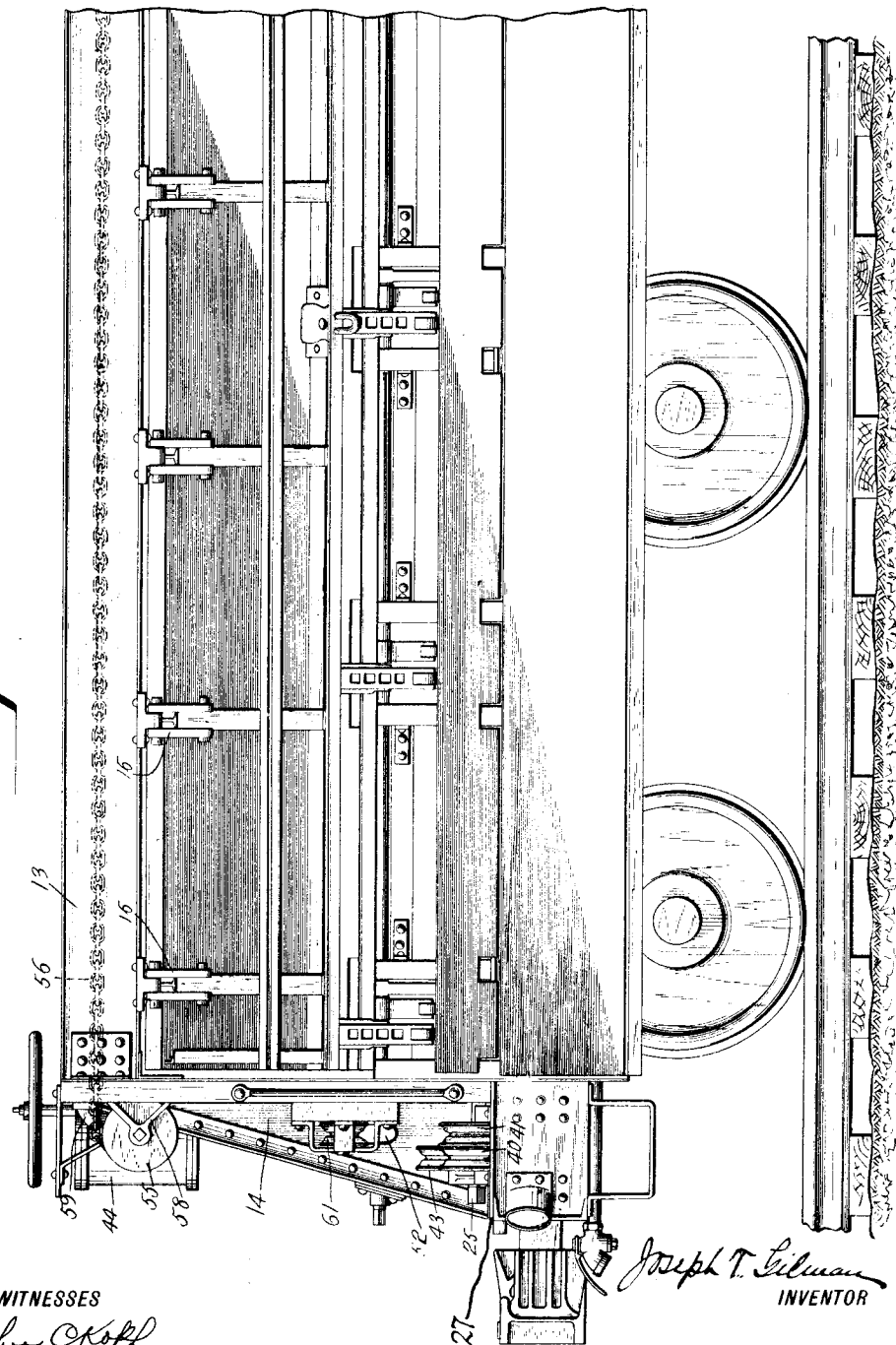


1,066,100.

Patented July 1, 1913.

5 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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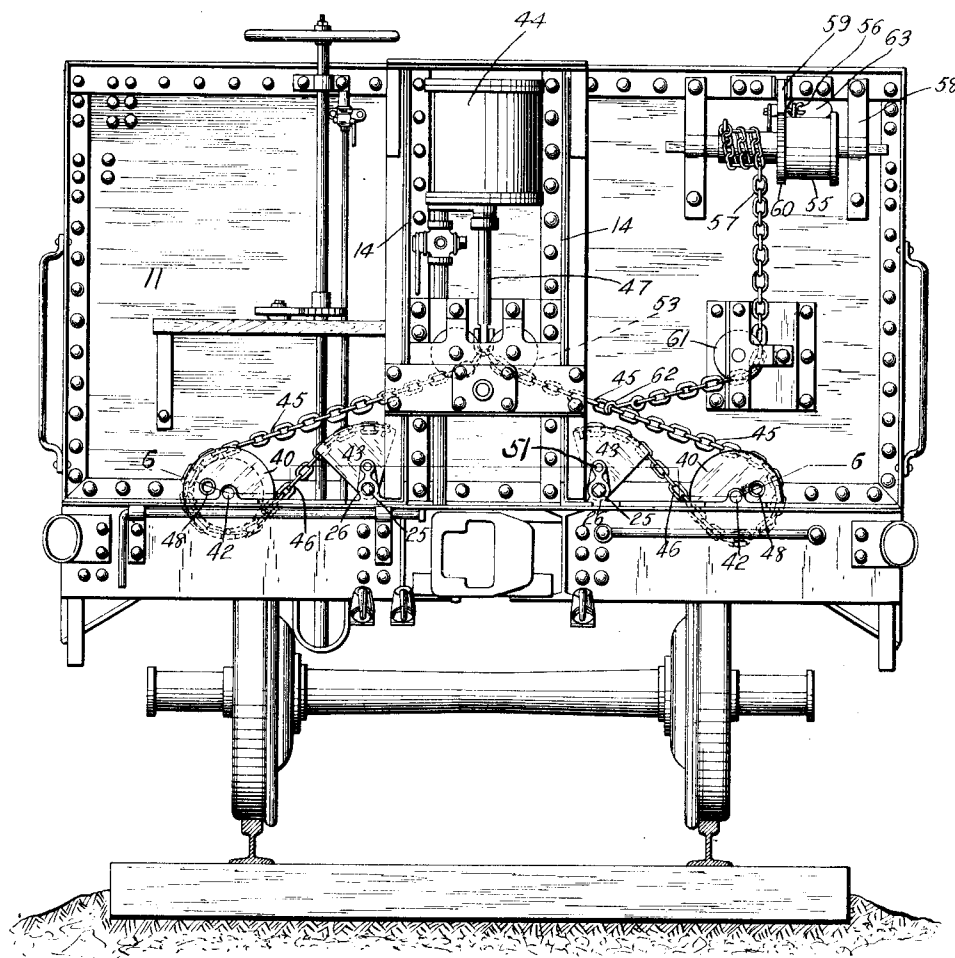
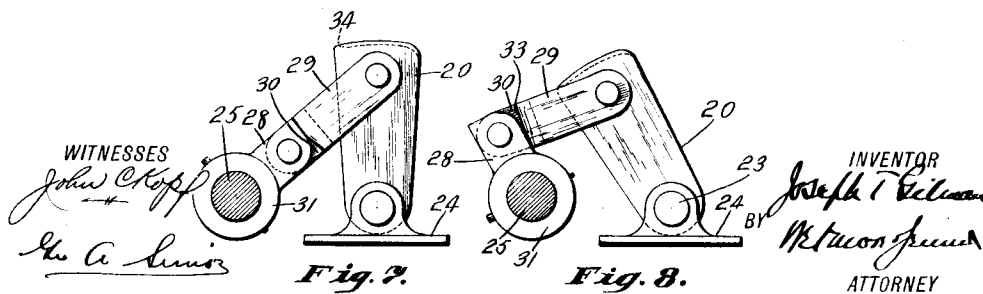
1,066,100.

J. T. GILMAN.
DUMPING VEHICLE.
APPLICATION FILED AUG. 23, 1912.

Patented July 1, 1913.

5 SHEETS—SHEET 2.

Fig. 2.



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Fig. 7.

Fig. 8.

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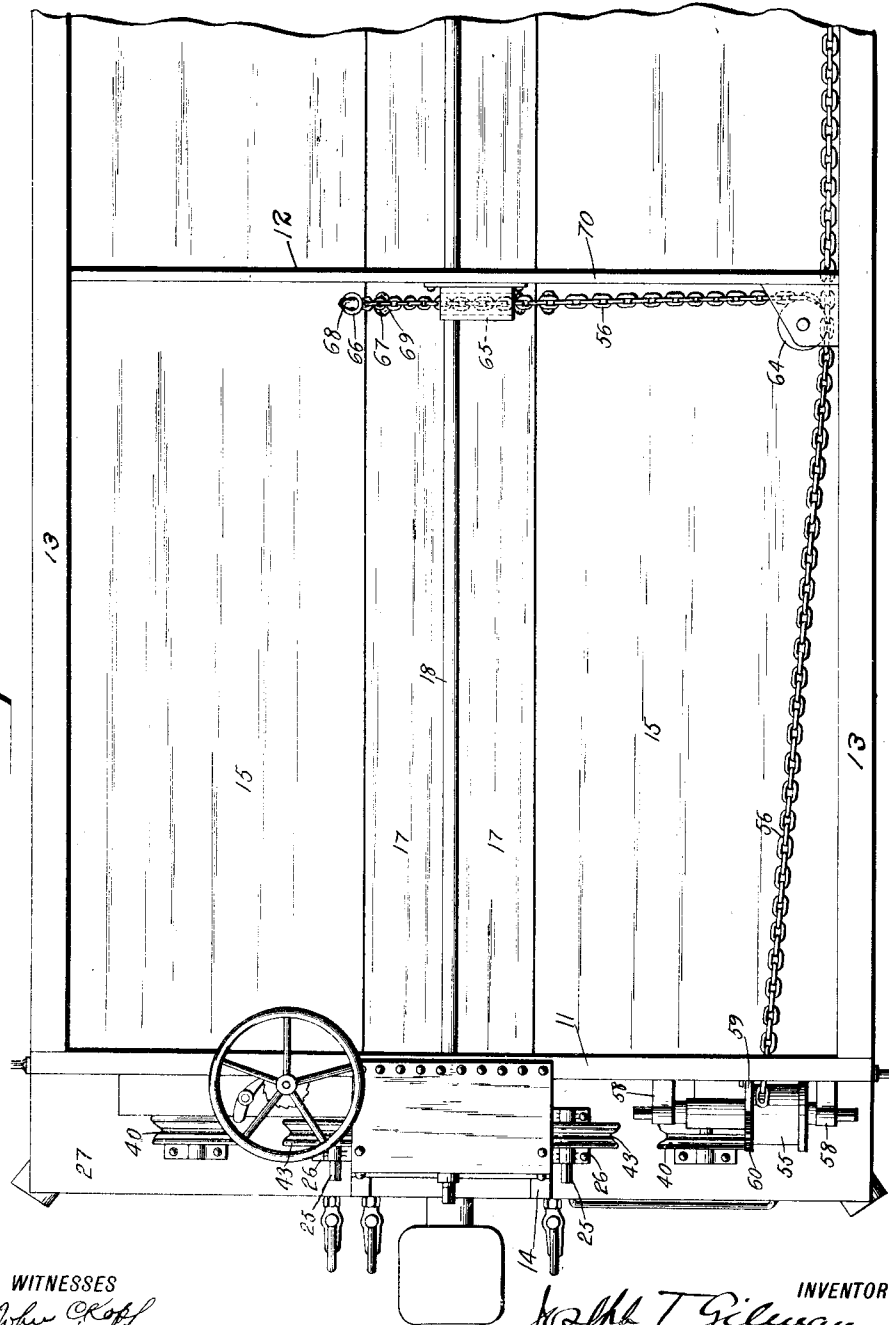
J. T. GILMAN.
DUMPING VEHICLE.
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1,066,100.

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5 SHEETS—SHEET 2.

Fig. 3.



WITNESSES
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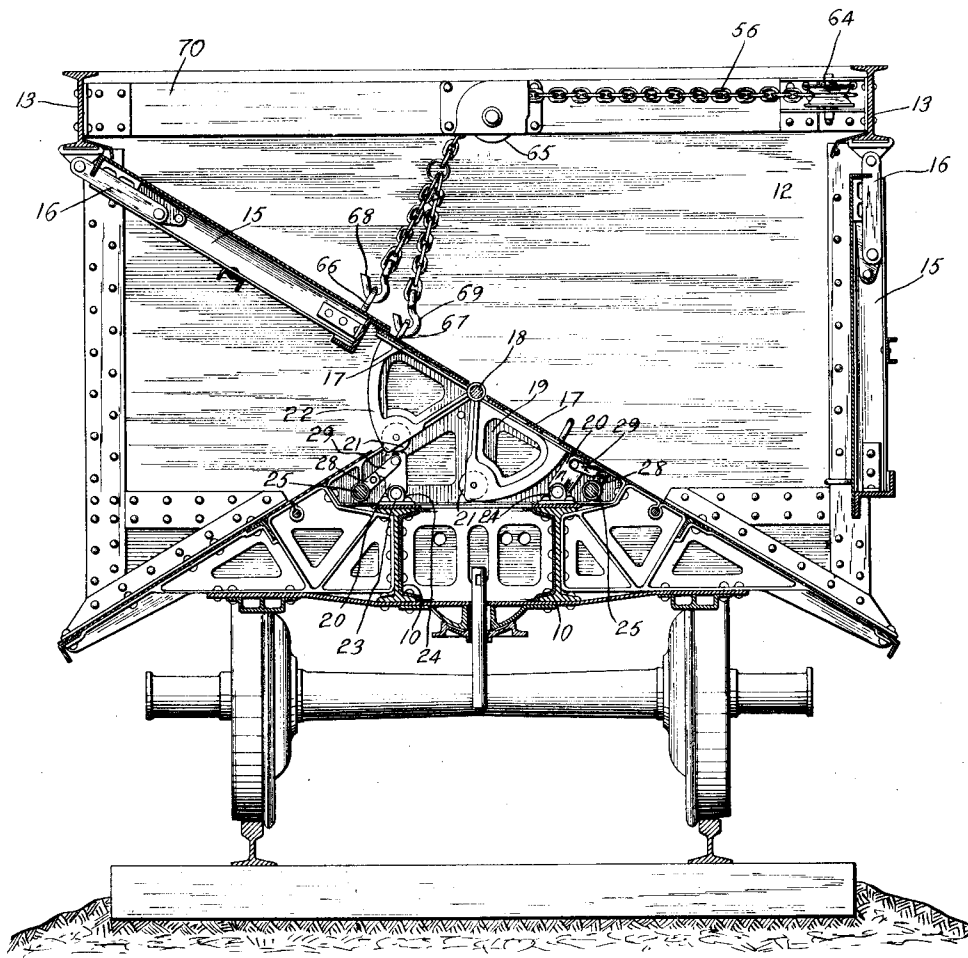
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Patented July 1, 1913.
5 SHEETS—SHEET 4.

Fig. 4.



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Patented July 1, 1913.

5 SHEETS—SHEET 5.

1,066,100.

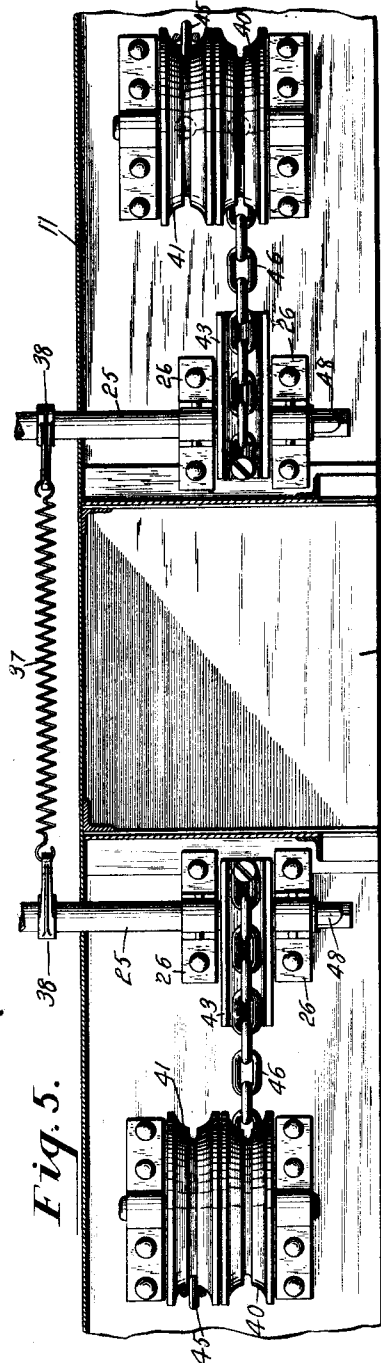


Fig. 5.

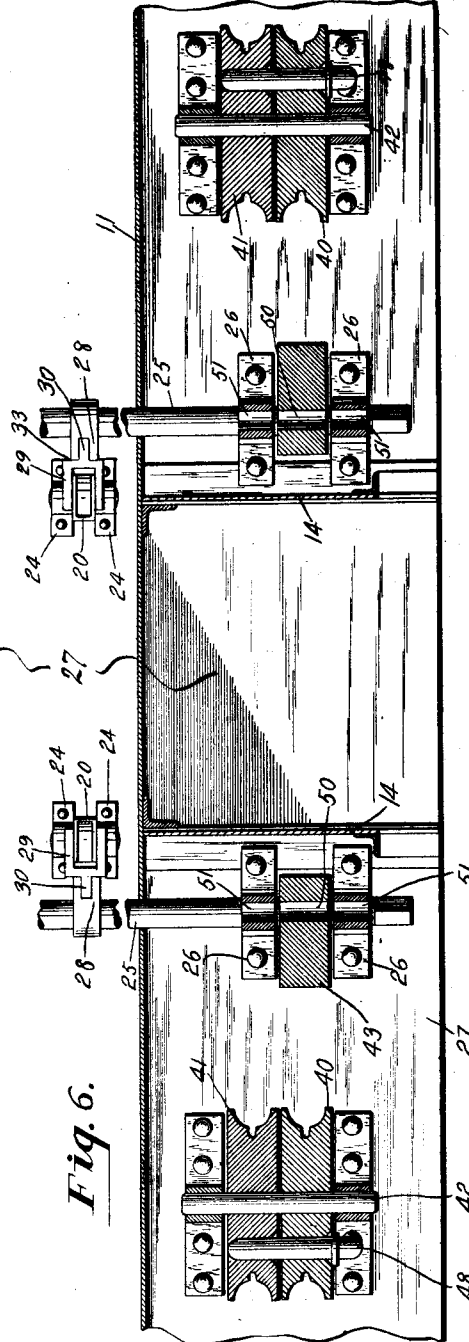


Fig. 6.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH T. GILMAN, OF CHICAGO, ILLINOIS.

DUMPING-VEHICLE.

1,066,100.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed August 23, 1912. Serial No. 716,574.

To all whom it may concern:

Be it known that I, JOSEPH T. GILMAN, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Dumping-Vehicles, of which the following is a full, true, and complete specification.

This invention relates to dumping vehicles and the improvements included therein are designed more especially with reference to that type of dumping vehicle known as Goodwin cars, the distinguishing features of which are well known to those skilled in the art. These improvements comprise a simple and effective reorganization of the detent mechanism for the center dumping valves; also the disposition and combination therewith of improved operating means at the end of the car for actuating the detents; also improved means whereby the same instrumentalities by which the valves are released may be employed for replacing them in closed position, as well as other combinations and sub-combinations of various parts, as will be pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a car embodying the invention, part of its length being broken away; Fig. 2 is an end elevation thereof; Fig. 3 is a partial plan view; Fig. 4 is a vertical transverse section through the car; Fig. 5 is a plan view of the detent-operating mechanism located on the platform outside the end bulk-head of the car; Fig. 6 is a section on the line 6-6 of Fig. 2; and Figs. 7 and 8 are detail views showing a detent and its operating link connection in valve-supporting and in released position.

As is well understood the framework of the car comprises a center sill structure 10, end and intermediate bulkheads 11, 12, mounted thereon, and side girders 13 supported by the bulkheads. The invention is also applicable to marine conveyances or even stationary bins, and in such cases, of course, the center sill structure will be counterpart and equivalent to any main support for the receptacle of the apparatus. In the car illustrated, the end bulkheads are strengthened on their outer sides by angle reinforcements fixed rigidly to the end of the center-sill and to the outer face of the bulkhead, the same comprising two upright spaced plates or stanchions 14 of suitable construction. The side dumping valves or drop-

doors 15 are double-hinged to the side girders by means of the links 16 and the center or detent valves 17 are pivoted on a central longitudinal shaft 18, the latter being carried by saddle frames 19 spaced at suitable intervals along the base support or center-sill. These center valves are adapted to engage the free inner edges of the side valves 15 to hold them in the closed condition shown at the left of Fig. 4. Dropping of the detent valves at either or both sides permits the corresponding side valve or valves to swing downward and outward, as shown at the right of Fig. 4, all as is well understood in the art.

The center or detent valves 17 are supported in their raised or closed positions by movable detents or thrust members 20, which when erect receive the thrust of bearing rollers 21 carried by the strut frames 22 which are fixed to the under side of said valves. In Goodwin car construction these tiltable detents have heretofore been mounted on longitudinal valve-releasing shafts, the rocking of which from the end of the car moved the detents outward from beneath the bearing members or rollers 21 of the strut frames so as to permit the latter and the valve to drop, and as a consequence of the severe load often imposed on the valves these longitudinal rock shafts were apt to become distorted, which of course rendered them difficult to operate.

In the present invention the detents and their controlling means or rock-shafts are so related that the latter are free of the load on the detents, and the detents are mounted so as to transmit the load directly to the center sill, this being a principle of the new construction which is susceptible of embodiments in various forms. In the particular construction shown in Figs. 4, 6, 7 and 8 such detents are individually and pivotally supported on the center sill by means of short trunnions 23 journaled in the strap brackets 24, the latter being riveted or otherwise permanently fixed to the upper sides of the sills, or to special bearing plates fastened thereon. The rock-shafts 25, by which these detents are operated, are located at their outer sides and extend the length of the car through the end bulkheads, where their ends are journaled in brackets 26 on the operating platforms 27. The shafts are connected to the detents by means of connections, each of

which includes a crank arm 28 fixed to the rock shaft and a link 29 pivoted to such arm and to the upper part of the detent, the said links 29 being preferably bifurcated so as to straddle the detents, and having a flat blade portion 30 which is received between corresponding bifurcations of the crank arm 28. These arms are conveniently formed on a collar 31 which is pinned to the shaft as indicated in the drawing, and the arrangement of the links and cranks is such that with the detents in normal or valve supporting position the crank will be in line with the link or carried slightly past center, in which position the locking shoulders 33 of the link 29 will abut solidly against the ends of the crank arms 28, thus forming a knuckle or knife joint. This form of joint is specially suited for the present purpose in that it not only serves to limit the rotation of the rock-shaft in one direction and the corresponding inward movement of the detent, but also serves as a positive locking means, absolutely preventing outward movement of the detent until the joint is broken by the rotation of the rock-shaft. It is thus rendered impossible for any force acting on the detent to move it until the releasing shaft has been rotated in its journals. The detents cannot start the rock-shaft in rotation. As an additional safeguard to this action of the detent operation, the top bearing surface of each detent, which is preferably grooved to receive the roller 21, terminates at the rear or outer side in a stop projection 34, so that excessive inward swinging of the detents is thus doubly prevented. When the center detent valve on one or both sides has been released or dumped, as by the rotation of the rock-shaft from the position indicated by Fig. 7 to that indicated in Fig. 8, the detents are held against replacement to erect position, by the edge of the strut frame 22, as shown at the right hand side of Fig. 4. The edge or outer side of the strut frame is curved in the arc of a circle about the axis 18 as a center, and its conformation is such that its curved surface in effect forms a track, which slides against the detent when the valve 17 is being raised, and thereby prevents the detent moving prematurely inward or interfering with the closing of the valve. Each detent, moreover, is under the influence of means tending to restore it to erect position. Such means may be gravity if desired, but is preferably a tension spring such as 37 (Fig. 5) connected to and between the arms 38 fixed to the detent shafts. This spring tends to rotate either or both shafts to the positions in which they close their knuckle-jointed connections with their respective detents, but as above stated the curved edge of the strut member 22 prevents such closing until the roller 21 passes

the upper end of the detent, whereupon the valve is automatically locked closed.

The ends of the shafts 25 which extend through the wall of the end bulkhead 11, and alongside of the stanchions 14, are there provided each with operating members through which they receive the rocking motion which opens the detents. These operating members are mounted on the rock shafts between the bearings 26, and are formed as sectors or drum segments 43, fast to such shafts. Through these sector crank arms, the rock-shafts on both sides of the car may be operated by means of an operating power device 44 which is common to both of them. This common operating means in the present case is an air cylinder, the piston rod 47 of which is connected by chains 45 and 46, or like flexible connections, with the said sectors. The chain 45 extends around a sheave 53 to a drum or sheave 41 to which it is permanently secured. This drum or sheave is loosely mounted on a short shaft 42 supported on the platform 27 and adjacent to a second similar drum 40 also loosely journaled on the same shaft. The chain or flexible operating connection 46 is permanently connected both to the drum 40 and to the sector arm 43, and a pin 48 is adapted to be thrust through registering holes in the adjacent drums when in certain positions, so that they will be thereby caused to rotate together, as a single drum. It will be evident from this construction that when the two drums are thus coupled and fluid pressure is admitted to the piston of the cylinder 44 the resulting motion thereof will be transmitted to the sector arm 43 in a direction to rotate the rock shaft and its detents outwardly, that is, to release and dump the corresponding center valves. As the rock shafts on both sides of the car are thus equipped with a line of power transmission from the central actuating device, it will be further evident that by inserting the pin 48 in one or both pairs of drums, one or both sides of the car may be dumped as desired. When it is not desired to release the center valve on either side, the pin 48 is removed and inserted in the hole 51 of one of the shaft brackets 26 and pushed through into a registering hole 50 in the adjacent sector arm, thereby holding and safeguarding the rock-shaft against accidental rotation. It will be apparent that the drums 40 and 41 need not have complete circular peripheries and that any available source of power may be used for actuating the chains. In the present case it is intended that the cylinder 44 be supplied with compressed air, bled into a special dumping reservoir, not shown, from the regular train line. The cylinder is mounted between the stanchion plates 14 above referred to and the chain sheaves 53 are carried on cross braces

secured to the edges of such plates as indicated in the drawings. The chains 45 pass to their sheaves through holes 52 cut or provided in the stanchions. In place of the pin 48, any other suitable device may be employed for connecting and disconnecting the two stretches of chain. The pin however is preferred in that it is interchangeable and can be used also to lock the rock shaft which of course is desirable to be done whenever the drums 40 and 41 are not connected.

The same means that effects the slight movement of the detents 20 sufficient to release the center valves also serves to produce the considerable movement necessary for their replacement, and the preferred embodiment of means whereby the air cylinder 44 is capable of this second function is shown in illustration of this part of the invention and consists in a simple form of hoist involving a form of multiplying gearing adapted for use with chain connections. This multiplying gearing comprises a drum 55 of two diameters, about the larger and smaller portions of which respectively are wrapped the chains 56 and 57. The shaft of the drum is suitably journaled in brackets 58 fixed to the upper part of the end bulkhead and at one side, and the drum is held against retrograde movement by a retaining pawl 59, which engages with a ratchet 60 formed on one of its flanges. The chain 57 passes downward and around an idler pulley 61 and is provided at its end with a hook 62 whereby it may be engaged with and disengaged from one of the valve-releasing chains 45. The chain 56 passes through an opening 63 in the bulkhead and thence extends longitudinally within the top of the car to an idler pulley 64 journaled in a cross brace 70 whence it passes to a central idler 65 on the said cross brace and thence downward. Another branch of the chain may pass on to another bulkhead 12, and there over pulleys similar to 64, 65, to engage valves farther along the car. The detent valves 17 as well as the side valves 15 can be replaced by this mechanism and to this end both valves are provided with suitable drop eyes 66, 67, adapted to be engaged by hooks 68, 69 on the ends of the forked branches of the chain 56. These hooks may be engaged with the eyes of the valves at either side of the car. The presence of the pawl and ratchet 59 and 60 is important in that they prevent slack chain inside the car.

In operation the chain 57 may be normally disengaged from the chain 45 so as to avoid useless operation of the drum 55 in releasing the valves. To replace the valves after the car has been dumped, the hooks 68, 69 are engaged with the eyes 66, 67, and the chain 57 is connected with the chain 45. The

pins 48 are of course removed so that the detents will be free to return to valve-supporting position at the conclusion of the replacing operation. Upward movement of the piston within the cylinder 44 then pulls downward on the chain 57 which is thereby unwound from the smaller part of the drum 55, causing the chain 56 to be wound up on the larger part, so that by a comparatively short piston movement the valves are moved through the considerable distance necessary to restore them to normal position. As soon as the valves 17 are replaced the detents 20 return automatically to supporting position by virtue of the spring 37 above referred to. It will be observed that the main power device, consisting in the present case of the power cylinder 44 thus operates the dumping mechanism of the vehicle through its lines of power transmission to the two detent shafts and through its third line of transmission to the valve hoisting or replacing apparatus, each of these lines being conveniently and readily disconnectible so that only that member that is desired, need be operated. Movement in one direction at the cylinder, that is to say, the upward movement of the piston, serves either to release the valves or to replace them.

The side-girder construction and certain of the features of the car shown in the drawings form the subject of companion applications for Letters Patent filed herewith.

I claim:

1. In a valved dumping vehicle of the kind described, the combination of a bottom support, side valves, central detent valves adapted to support the side valves, detents supporting said detent valves on said bottom support and adapted to be turned outward to release the same, and longitudinal releasing shafts operatively connected with said detents and free of the load thereon.

2. In a valved dumping vehicle of the kind described, the combination of a center sill or sills, dumping valves at opposite sides of the longitudinal median line and hinged at their inner edges above the sills to swing downward and outward, upright detents interposed as thrust connections between the outer portions of the valves and the center sills, being separate from and adapted to be turned outward to clear the valves in order to release the same, releasing shafts journaled to rotate about fixed axes at the outer sides of said detents beyond the paths of the valves, and connections between said shafts and detents.

3. In a valved dumping vehicle of the kind described, the combination of a bottom support, side valves, central detent valves adapted to support the side valves, and detents individually supported on said bottom support and normally transmitting the load on said detent valves directly thereto.

4. In a valved dumping vehicle of the kind described, the combination of a center sill or sills, side valves, central detent valves adapted to support the side valves, detents pivotally supported on the center sills and projecting upward to support the detent valves, being arranged so as to be swung outside the paths of the detent valves to release the same, longitudinal operating shafts free of the load on said detents, and connections between said shafts and detents.

5. In a valved dumping vehicle of the kind described, the combination of a dumping valve, a support, a detent for supporting said valve, being mounted on said support separate from the valve, a rock-shaft for releasing such detent and an automatically locking operating connection between said shaft and detent whereby the detent can not rotate the rock-shaft.

6. In a valved dumping vehicle of the kind described, the combination of a base support, side valves, central detent valves adapted to support the side valves, detents transmitting the load on the detent valves to the base support and adapted to be moved to release the valves, a shaft to operate the detents free of the load thereon, and means acting on said shaft to restore the detents to valve-supporting position.

7. In a valved dumping vehicle of the kind described, the combination of a dumping valve, a support, a detent for supporting valve, being mounted on said support separate from the valve, a rock shaft having a crank arm thereon, and a link knuckle-jointed to said arm and connecting the same to move the said detent from valve-supporting to valve-releasing position.

8. In a valved dumping vehicle of the kind described, a dumping valve, a support, a detent for supporting the valve, being mounted on said support separate from the valve, and means for operating said detent comprising a knuckle-jointed operating connection arranged when straightened past the center line to maintain the detent in valve supporting position.

9. In a valved dumping vehicle of the kind described, the combination of a dumping valve, one or more detents for supporting and releasing the same, an operating shaft for releasing the detents, locking connections between the shaft and detents, and spring means for urging said shaft in a direction to restore the detents and to cause said connections to lock against reverse movement.

10. In a valved dumping vehicle of the kind described, the combination of dumping valves, one or more detents for supporting and releasing the same, a releasing shaft connected with the detents, means for urging said shaft in a direction to restore the detents to valve-supporting position, and

means for holding the detents against return to said position while the valves are open.

11. In a valved dumping vehicle of the kind described, the combination of a dumping valve, detents for supporting and releasing the same, a detent-controlling means free from the load on said detents, and spring means for urging the detents in a direction to restore them to their valve-supporting position.

12. In a valved dumping vehicle of the kind described, the combination of dumping valves on either side of the axis of the vehicle, detents therefor, longitudinal rock shafts at opposite sides of said axis for releasing said detents, and a spring connecting said shafts and urging the same in reverse directions to restore the detents.

13. In a valved dumping vehicle of the kind described, the combination of a center sill support, dumping valves on either side of the axis of the vehicle adapted to dump downward and outward, detents mounted on said support and projecting upward to support said valves, said detents being mounted so as to turn outward clear of the valves so as to release the same, longitudinal rock-shafts mounted to turn about fixed axes at the outer sides of said detents, and connections between said detents and shafts to withdraw the detents outward.

14. In a valved dumping vehicle of the kind described, the combination of dumping valves having bearing rollers, and tilting detents beneath said valves having surfaces to receive the thrust of said rollers, stop elevations terminating said surfaces at the rear, and means separate from the detents for moving them from supporting engagement with said rollers.

15. In a valved dumping vehicle of the kind described comprising detent-supported dumping valves, the combination of means tending to urge the detents toward their valve-supporting positions, and operating means for moving said detents in the opposite direction and adapted to lock the detents automatically when moved by the aforesaid means to valve-supporting position.

16. In a valved dumping vehicle of the kind described, one or more valve supporting detents, a valve supported thereby having a strut frame adapted for engagement with the detent and serving to obstruct return movement thereof, means tending to return the detent and means including a knuckle-joint for moving the detent in the opposite direction.

17. In a valved dumping vehicle of the kind described, the combination of a dumping valve having a strut-frame on the under side thereof, a detent separate from and supporting the strut frame, adapted to be

turned to allow the valve and frame to be dropped, said frame being formed to engage and hold the detent in its said turned position until the valve is replaced.

18. In a valved dumping vehicle of the kind described, the combination of a detent member movable into and out of valve-supporting position, a valve supported on such detent and released by the movement thereof, and means on the valve for obstructing return movement of the detent while the valve is in open or intermediate positions, and until it is closed.

19. In a valved dumping vehicle of the kind described, the combination with an end bulkhead and a bulkhead angle reinforcement comprising spaced upright plates, of valve-releasing shafts projecting at the outer sides of said plates, a piston and a cylinder between said plates and flexible operating connections extending from said piston, through the plates to the ends of said shafts and adapted to rotate the latter.

20. In a valved dumping vehicle of the kind described, the combination with an end bulkhead and a bulkhead reinforcement comprising spaced upright angle members, of valve-releasing shafts projecting at the outer sides of said angle members, pivoted shaft operating members disposed outboard of said shafts, means to connect and disconnect said operating members with the shafts, and means located between said angle members for actuating the pivoted members at both sides of said reinforcement.

21. In a valved dumping vehicle of the kind described, the combination of a longitudinal valve-releasing shaft, an operating device, members movably supported at a point removed from said shaft, means for connecting and disconnecting said members, and motion-imparting connections on the one hand, between said device and one of said members, and on the other hand between the other member and said shaft.

22. In a valved dumping vehicle of the kind described, the combination with an end bulkhead, dumping valves, and detents, of a longitudinal detent-releasing shaft projecting beyond the plane of said bulkhead, an actuating power device also outside the bulkhead, an intermediate actuating member pivotally supported on an axis parallel to and removed from that of said shaft, and means for connecting and disconnecting said member from said shaft.

23. In a valved dumping vehicle of the kind described, the combination of two valve-releasing shafts, sector levers associated therewith, a central actuating device, drum members at the outer sides of said shafts, and flexible connections extending outward from said actuating means to said drum members and from the drum members inward to said sector levers.

24. In a valved dumping vehicle of the kind described, the combination of a valve-releasing shaft, a sector arm thereon, drum members supported side by side on a common axis, means for connecting and disconnecting them, actuating means, a flexible connection between said actuating means and one of said drum members, and a flexible connection between the other drum member and said sector arm.

25. In a valved dumping vehicle of the kind described, the combination of a valve-releasing shaft having an arm, pivotally-supported co-axial members, means for actuating one of said members, and an element interchangeably adapted to couple said members together or to lock the said arm against turning.

26. In a valved dumping vehicle of the kind described, the combination with dumping valves, detents therefor, and an end bulkhead, of an actuating device, valve-releasing shafts projecting outside the bulkhead, upwardly-projecting arms attached to the ends of said shafts, pivoted members at the outer sides of said shaft ends, and flexible connections extending from said actuating device outward to said members and thence inward to said arms.

27. In a valved dumping vehicle of the kind described, the combination with the dumping-valves and valve-supporting detent mechanism including a pair of rock-shafts extended to the end of the vehicle, of a power device having disconnectible lines of power transmission to each of said shafts whereby either or both may be operated to dump one or both sides of the vehicle, and a valve-hoist for replacing said valves, including a disconnectible line of power transmission from said power device to the said valves.

28. In a valved dumping vehicle of the kind described, the combination with the dumping valves, detents and detent operating shafts, of a power device having disconnectible lines of power transmission to said shafts whereby either or both may be operated, and a line of power transmission to said valves whereby they may be replaced, said latter line including motion multiplying apparatus.

29. In a valved dumping vehicle of the kind described, the combination with a dumping valve, and valve-releasing and replacing means, of a common operating device therefor and disconnectible lines of power transmission to each of said valve-releasing and replacing means.

30. In a valved dumping vehicle of the kind described, the combination with a dumping valve, of a valve-releasing shaft, valve replacing mechanism, a cylinder constituting common operating means for said shafts and mechanism, and connections

whereby movement in one direction at the cylinder serves either to release or to replace the valve.

31. In a valved dumping vehicle of the kind described, the combination with a dumping valve of valve hoisting means therefor comprising a multiplying drum and an operating power device having connections to said drum for rotating the same.

32. In a valved dumping vehicle of the character described, the combination of a dumping valve, a power device serving both to release and replace the same, a detent for supporting the valve in normal position, and means for automatically returning the detent to valve-supporting position.

33. In a valved dumping vehicle of the character described, the combination with a dumping valve and a detent for supporting the same in closed position, of a power device for releasing said detent to cause the

valve to dump the load, and connections including a motion-multiplying device enabling said power device to replace the valve.

34. In a valved dumping vehicle of the character described, the combination with a dumping valve and a detent for supporting the same, of a power device for releasing said detent, drum and chain mechanism adapted to be operated by said power device to replace the valve, and means cooperating with said drum to prevent presence of slack chain inside the vehicle.

In testimony whereof, I have signed this specification in the presence of two witnesses.

JOSEPH T. GILMAN.

Witnesses:

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H. VAN SCOY.