Nov. 28, 1939. J. H. SLAKER 2,181,629

DUMP CAR

Filed Jan. 31, 1927 2 Sheets-Sheet 1

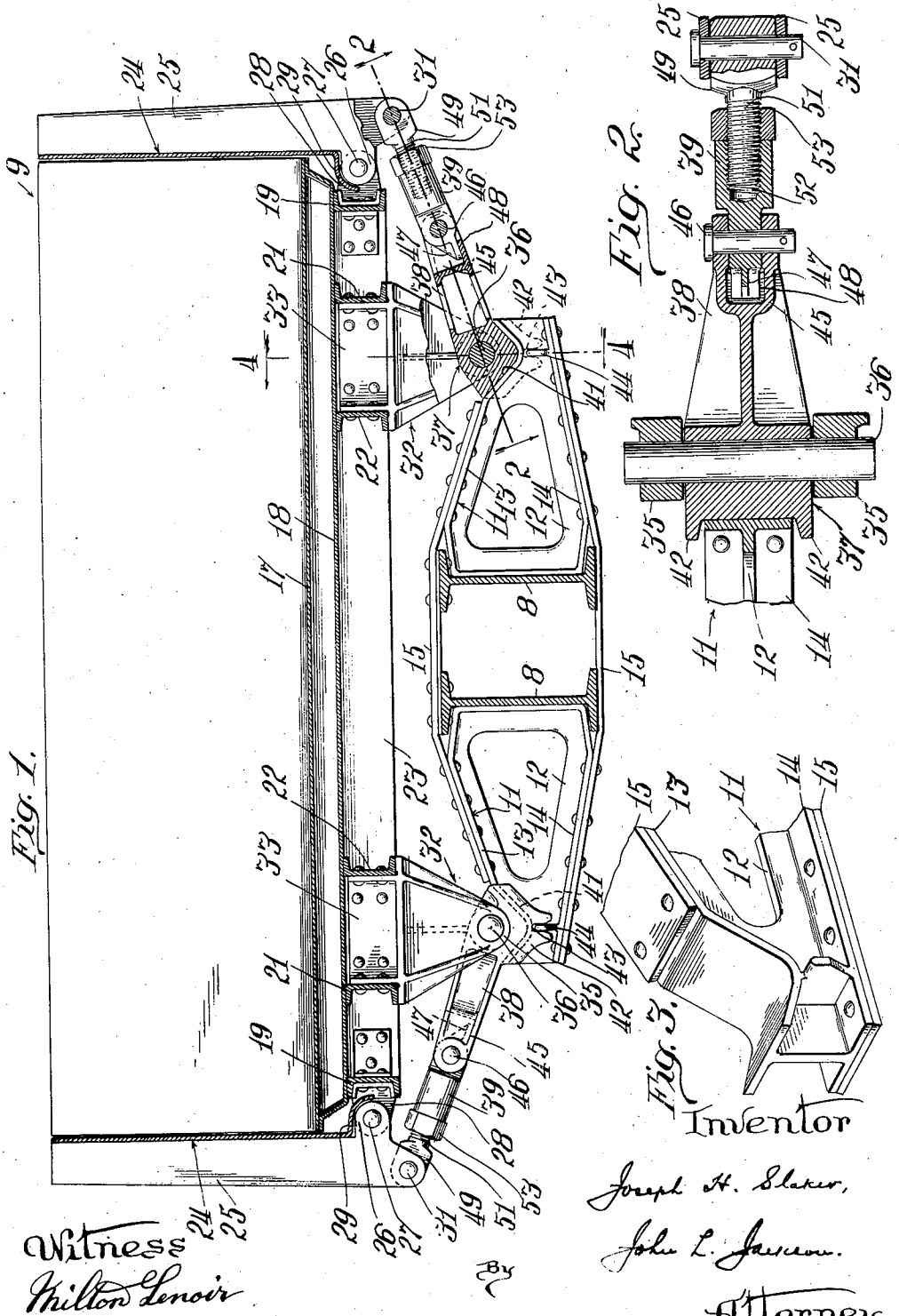


Fig. 1.

Fig. 2.

Fig. 3.

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Filed Jan. 31, 1927 2 Sheets-Sheet 2

Fig. 4.

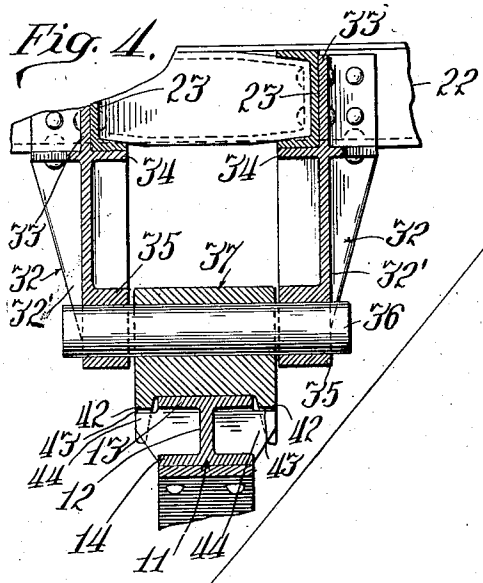


Fig. 5.

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UNITED STATES PATENT OFFICE

2,181,629

DUMP CAR

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Application January 31, 1927, Serial No. 164,740

50 Claims. (Cl. 105—276)

My invention relates to dump cars of the type in which the load carrying body or bed of the car is tiltably mounted on the under frame of the car in order to dump the load laterally to either side of the car, and in which this load carrying body or bed is provided with side gates or doors mounted to swing outward and downward to a position approximately level with or slightly below the bottom or floor of the bed to form a lateral extension thereof, thereby serving as a chute to direct the load out away from the car, so that it will not be deposited on the road bed. Dump cars having this arrangement of side gates or doors are frequently referred to as drop door cars. More specifically, my invention relates to these drop door cars of the above general description wherein tilting movement of the load carrying bed to dumping position at either side of the car occurs about fulcrums which are spaced laterally from the longitudinal center line of the car. The provision of the laterally spaced fulcrums avoids the severe dumping shock which is an objectionable characteristic of drop door cars wherein the entire tilting movement of the bed occurs around a centrally disposed hinge or pivot axis. In such latter type of center hinge cars, the outward and downward folding movement of the gate or door at the dumping side causes the weight of the door to add to the unbalanced condition of the bed, and to this is still further added the weight of the load pressing outwardly against the downwardly folding door, and sliding outwardly over said door as the bed approaches its final dumping angle, the weight of the door and load tending to cause the bed to drop down with a severe dumping shock in the center hinge type of car. The provision of the laterally spaced fulcrums in the car herein disclosed avoids this dumping shock, and results in other advantages which will hereinafter appear. In the preferred embodiment of my invention herein disclosed, the bed is normally supported in stable equilibrium on the laterally spaced fulcrums, although this is not essential.

The general object of the present invention is to provide an improved dump car of the above general description, characterized particularly by the provision of improved controlling mechanism for controlling or actuating the side gates. This mechanism operates to hold the gates effectively closed when the bed is in its normal or horizontal position; and, in the dumping operation, permits the gate at the dumping side to swing outwardly and downwardly to a position substantially in prolongation of the floor of the bed, while maintaining the gate at the opposite side in its closed position. Other objects and advantages of my invention will appear from the following detail description and accompanying drawings disclosing one preferred embodiment of my invention.

In the accompanying drawings,

Fig. 1 is a transverse sectional view through a car embodying my invention, certain parts being broken away fragmentarily, and the running gear being omitted;

Fig. 2 is a longitudinal sectional view through one of the toggle mechanisms, corresponding to a section taken on the plane of the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary perspective view illustrating one of the V-shaped bearing seats in which the bearing blocks of the bed engage;

Fig. 4 is a vertical sectional view through one of the rocker brackets and the bearing block mounting of the bed on the under body of the car, corresponding to a section taken on the plane of the line 4—4 of Fig. 1; and

Fig. 5 is a fragmentary view similar to Fig. 1, illustrating the bed in dumping position.

The car bed, and the under body or frame that supports it, may be of any desired construction, and the bed may be mounted on the under body to swing laterally either about fixed pivots or about laterally spaced fulcrums, but in the accompanying drawings I have chosen to illustrate my improvements applied to a car having the latter construction. The operation of dumping the car bed may be performed manually or through power derived from air or steam cylinders having operative connection to raise either side of the bed. This practice of employing power cylinders for tilting the bed is well-known, and inasmuch as this apparatus forms no particular part of the present invention I have not shown the same.

Referring now to the drawings, which illustrate one of various ways in which my improvements may be embodied in practical form, 8 indicates two longitudinally disposed I-beams which constitute the center sill of the under body of the car. This center sill is mounted on trucks in the usual way and supports the car bed 9 through transversely extending frame members 11 which are secured to the outer sides of the sill beams at different points along the length of the car. As shown in Fig. 3, each of these frame members comprises a central web portion 12 and upper and lower flanges 13 and 14. These frame members may be secured to the sill beams in any suit-

able manner; in the construction shown, heavy straps or plates 15 extend across the upper and lower sides of the sills and are riveted to the flanges thereof and to the flanges 13 and 14 of the frame members.

The car bed 9 comprises any suitable floor construction, in the embodiment shown, consisting of spaced plates 17 and 18 which are joined along the lateral margins of the floor. This car bed is built upon a frame comprising a plurality of longitudinally extending channel beams 19, 21, and 22, which are cross-connected at different points along the length of the car by transversely extending channel beams 23. The sides of the car bed are adapted to be closed by gates 24 which are pivotally connected to the frame of the bed below the level of the floor 17, 18.

Secured to the outer sides of the gates are vertically extending bars 25 that project down below the lower margins of the gates for making pivotal connection with the frame of the bed, and also for making pivotal connection with the toggle linkage to be hereinafter described. These bars are preferably of channel formation to provide two outwardly projecting spaced flanges. Pivot lugs 26 extend inwardly from these flanges for receiving pivot pins 27 which are mounted at their ends in brackets 28 secured to the outer sides of the channels 19. The sheet metal siding of each gate is preferably formed with curved tongue portions 29 which extend down over the pivot lugs 26 and pivot pins 27 to prevent the entrance of dirt to the bearing surfaces of the pivots. The bars 25 extend down below the pivot lugs 26 to support pins 31 to which the toggle linkage has pivotal connection.

Secured to the under side of the bed frame are a plurality of rockers 32 which carry the weight of the bed. These rockers are arranged in transversely alined pairs, spaced relatively far apart, and two or more of such pairs of rockers are provided adjacent the ends of the car and at any desired intermediate points. Referring to Fig. 4, each of these rockers comprises two spaced brackets 32', suitably secured to the frame of the bed, such as by having vertically extending flanges 33 riveted to the vertical sides of the frame channels and having horizontally extending flanges 34 riveted to the bottom flanges of said channels. The lower ends of these brackets are provided with bosses 35 through which a heavy bearing pin 36 is extended. Pivotally mounted on this bearing pin between the pair of brackets 32' is a bearing block 37 which is adapted to seat on one of the transversely extending frame members 11. This bearing block is also formed integral with the innermost link of a pair of toggle links 38 and 39, the operation of which I shall presently describe. The bottom surface of this bearing block is formed with a wedge-shaped contour, as best illustrated in section in Fig. 1, and this wedge-shaped surface is adapted to seat in a V-shaped socket or recess 41 formed in the outer end of the adjacent frame member 11. As shown in Fig. 3, this socket is provided by forming a V-shaped depression in the upper flange 13 of the frame member. Extending downwardly from each side of the wedge-shaped bearing surface are flanges 42, the inner sides of which are sloped outwardly, as best shown in Fig. 4. In the tilting of the bed, the bearing blocks at one side of the car are lifted bodily out of their seating sockets 41, and in the return movement of the bed to horizontal position the sloping flanges 42 aid in properly centering the bearing blocks in their movement back into the sockets. At each side of the bearing block these flanges are provided with vertical slots 43 adapted to embrace ribs or shoulders 44 extending laterally from the frame members 11 just below the bottoms of the bearing seats 41. The lower ends or throats of these slots are flared outwardly to facilitate the engagement of the slots over the ribs 44 in the return movement of the bed to normal position.

As above described, each bearing block 37 is formed as an integral part of a toggle link 38, which link extends outwardly and upwardly from between the rocker brackets 32'. The outer end of each link is forked as indicated at 45 in Fig. 2, to receive the cooperating end of the outer toggle link 39. A pivot pin 46 extends through this bifurcated end 45 and through the end of the link 39 to form an intermediate pivot or knuckle joint for the toggle. It is desirable that downward hinge movement of this knuckle joint be limited to a locking position just past center, and to this end a lug 47 is extended from the end of the link 39 in position to bear against a web portion 48 formed at the under side of the link 38 in the bifurcated portion 45. The outer toggle link of each pair is constructed so that its effective length can be conveniently adjusted for securing proper closure of the gate 24. To this end, such link comprises an eye bolt 49 having a threaded shank 51 which screws into a threaded socket 52 formed in the inner member of the link. A lock nut 53 serves to secure this extensible adjustment at its desired setting. The eye portion of this eye bolt extends between the side flanges of the associated gate bar 25 and receives the pivot pin 31. It will be understood that the foregoing description, specific to one of the rockers, bearing blocks and associated linkage, is applicable to all of these units, as they are all substantial duplicates. These bearing supports and toggle mechanisms may be confined to the end portions of the car, or any desired number of such units may be located at different intermediate points along the length of the car. It is possible to locate the gate controlling toggle mechanisms 37, 38, 39, etc., at different intermediate points along the length of the car by reason of the fact that all parts of said gate controlling mechanisms are always below the plane of the load carrying surface of the bed 9 in all positions of the bed.

When the bed 9 is in its normal horizontal position with the bearing blocks 37 at each side resting in their bearing sockets 41, the toggle mechanisms 38, 39 will be straightened out with each knuckle joint 46 moved slightly past center, as represented by the section line 2—2 in Fig. 1. This corresponds to a locked condition of the toggle mechanism, with the lug 47 of the outer link bearing against the stop surface 48 of the inner link and preventing downward folding of the knuckle joint. Hence, with the bed in this position, the gates 24 will be locked against outward swinging movement, even under the relatively heavy pressure of a large load bearing outwardly against the gates. It will be evident that this outward pressure will merely exert an inwardly acting end thrust on the toggle linkage, which is now in a locked position with the lug 47 bearing against the stop surface 48. By virtue of this locking action of the toggle mechanism the necessity of latches for the gates is avoided.

The dumping operation is performed by rocking the bed upwardly at either side around the bearing pins 36, as shown in Fig. 5. The toggle linkage at the elevated side of the bed does not change its position relative to the bed in such upward swinging movement, the wedge-shaped bearing block 37 merely lifting straight out of its socket 41, and the slots 43 moving clear of the ribs 44 without causing any pivotal movement of the toggle link 38 relative to the bearing pin 36. The action of gravity on the two parts 38 and 39 holds these parts in locking relation at the rising side of the bed so that the gate at this side remains locked in closed position. At the lower or dumping side of the bed, however, the inner link 38 maintains a stationary position so that the knuckle joint 46 remains at a fixed point in space relative to the bed 9. This naturally follows from the fact that the weight of the bed, acting through the rocker brackets 32', holds the wedge-shaped bearing block 37 in firm seating engagement in the V-shaped seating socket 41; and the engagement of the slots 43 over the ribs 44 also positively locks the bearing block and toggle link 38 against pivotal movement. The pivotal movement of the bed occurs around the axis of the bearing pin 36. With the toggle link 38 and knuckle pivot 46 remaining in a stationary position, it will be evident that as the hinge center 27 of the lower gate swings downwardly around this knuckle center the pivot point 31 will be drawn inwardly and upwardly relative to the gate hinge 27 through the link 39. This will cause the gate to swing outwardly until, when the bed is in its fully tilted position, the gate will extend downward and outward therefrom substantially in continuation of the bed, whereby the gate will serve as a chute to direct the load out away from the car. In the return movement of the bed to horizontal position, the toggle links at the dumping side will straighten out and compel the return of the lower gate to closed position.

It will be observed from Fig. 5, that by virtue of the present mounting of the bed on the two widely spaced rockers, the bed can be tilted to an acute dumping angle without interference with the under body. It will also be noted that the channels 21 terminate at the sides of the brackets 32' to leave open spaces in the under side of the bed for accommodating the ends of the link arms 38 in the tilting of the bed.

The invention herein disclosed is an improvement upon the invention disclosed in my copending application Serial No. 67,523 filed November 7, 1925, issued as Patent No. 1,977,836 October 23, 1934. The broad claims to subject matter common to the two applications have been made in the prior application Serial No. 67,523.

What I claim as my invention and desire to secure by Letters Patent, is—

1. A dump car comprising a tilting bed, an under body on which said bed is supported, coacting laterally spaced fulcrums operative between said bed and said under body for normally holding said bed in substantially stable equilibrium, said bed tilting about said fulcrums in the dumping operation, a side gate for said bed mounted to swing outward and downward from its closed position, a toggle adapted to hold the gate closed, comprising a movably mounted toggle pivot, and means adapted to engage the under body for holding said pivot at the dumping side of the car in stationary position in the dumping operation, said means being automatically separable entirely from said under body upon the tilting of said bed in the opposite direction.

2. A dump car comprising a tilting bed, an under body on which said bed is supported to tilt about laterally spaced fulcrums, a side gate for said bed mounted to swing outward and downward from its closed position, toggle means remaining below the plane of the load carrying surface of said bed and adapted to hold the gate closed, said toggle means comprising an intermediate knuckle joint, and means effective upon the tilting of said bed for holding said knuckle joint in stationary position.

3. A dump car comprising a tilting bed, an under body on which said bed is supported, coacting laterally spaced fulcrums operative between said bed and said under body for normally holding said bed in substantially stable equilibrium, said bed tilting about said fulcrums in the dumping operation, a side gate for said bed mounted to swing outward and downward from its closed position, and gate opening mechanism comprising a pair of connected links having operative connection with said gate, and means automatically separable entirely from said under body and effective upon the tilting of said bed for holding one of said links in stationary position.

4. A dump car comprising a tilting bed, an under body on which said bed is supported, coacting laterally spaced fulcrums operative between said bed and said under body for normally holding said bed in substantially stable equilibrium, said bed tilting about said fulcrums in the dumping operation, a side gate for said bed mounted to swing outward and downward from its closed position, a pair of toggle links adapted to hold the gate closed, and means automatically releasable entirely from said under body and effective upon the tilting of said bed for holding one of said links in stationary position.

5. A dump car comprising a tilting bed, an under body on which said bed is supported, coacting laterally spaced fulcrums operative between said bed and said under body for normally holding said bed in substantially stable equilibrium, said bed tilting about said fulcrums in the dumping operation, a side gate for said bed mounted to swing outward and downward from its closed position, gate opening mechanism comprising outer and inner links pivotally connected together and operative to move said side gates from open to closed position, said outer link being connected to said gate, and said inner link comprising means for establishing a locking relation with said under body and effective when said bed is in transport position, said means being releasable entirely from said under body when the bed is tilted.

6. A dump car comprising a tilting bed, an under body on which said bed is supported, coacting laterally spaced fulcrums operative between said bed and said under body for normally holding said bed in substantially stable equilibrium, said bed tilting about said fulcrums in the dumping operation, a side gate for said bed mounted to swing outward and downward from its closed position, gate opening mechanism comprising inner and outer toggle links, a knuckle joint connecting said links, said inner link being connected to said under body, means pivotally connecting said outer link to said gate, and means for stationarily locking said inner link to said under body to break said knuckle joint and per-

mit the gate to open when the bed is tilted to discharge its load.

7. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported on laterally spaced fulcrums, side gates for said bed mounted to swing outward and downward from their closed position, operating mechanism for each of said gates, each of said operating mechanisms comprising a link connected to its gate and a movably mounted pivot for said link, and means establishing locking engagement with the under body at the dumping side of the car and effective upon the tilting of said bed for holding said pivot at the dumping side substantially stationary, the corresponding locking means at the opposite side of the car operating to automatically unlock itself from the under body to permit the pivot of the operating mechanism for the other gate to rise with its connected link in the dumping operation.

8. A dump car comprising an under body, a car bed having rocking support thereon at opposite sides of its center, side gates pivotally connected adjacent to their lower edges to said bed to swing outward and downward from their closed position, gate controlling mechanism including devices supported independently of the under body, and connected with the side portions of the bed to swing therewith for holding the gate at the high side closed during dumping, and including means established engagement with said under body for holding the gate controlling device at the dumping side of the car substantially stationary.

9. A dump car comprising a bed having rocking support at opposite sides of its center, an under body on which said bed is supported, side gates for said bed adapted to swing outward and downward from their closed position, toggle devices connected with said gates and with the side portions of said bed to swing therewith, and holding means on said under body individual to each gate and disposed on the same side of said under body as said gate for holding parts of the toggle devices at the dumping side against movement during the dumping operation, said holding means automatically releasing said toggle devices at the opposite side of the car in the dumping operation.

10. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported on laterally spaced fulcrums, side gates for said bed mounted to swing outward and downward from their closed position, inner and outer toggle links for each of said gates, the outer toggle link of each pair being pivotally connected to said gate, the inner toggle link of each pair being pivotally connected to said bed, and means for preventing tilting of the inner toggle link at the dumping side of the bed with the tilting of said bed to dumping position, said means being releasable in its entirety from said under body.

11. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, cooperating laterally spaced fulcrums on said bed and on said under body for normally holding said bed in substantially stable equilibrium, said bed tilting on said fulcrums in the dumping operation, side gates for said bed mounted to swing outward and downward from their closed position, a pair of toggle links for holding each of said gates closed, and means for locking the inner toggle link at the dumping side of the bed to said under body with the tilting of said bed to dumping position, said means being automatically releasable in its entirety from said underbody.

12. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, bearing members supported independently of the under body and movably connected to said bed on laterally spaced axes maintained in fixed relation to the bed, said bearing members adapted to rest on said under body, said bed tilting laterally in either direction about said bearing members, and means operating under said bed and utilizing the relative movement between one of said bearing members and said bed in the tilting of the latter for controlling the opening of the gate at the dumping side of the bed.

13. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, bearing members suported independently of the under body and pivotally connected to said bed, on laterally spaced axes maintained in fixed relation to the bed, said bearing members adapted to rest on said under body, said bed swinging about one or the other of said bearing members in its tilting movement, and toggle link mechanism actuated by relative pivotal movement between said bed and one of said bearing members for operating the gate at the dumping side of said bed.

14. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, bearing members pivotally connected to said bed and rockable into and out of resting support on said under body in the tilting of said bed, means for preventing rotation of said bearing members when resting on said under body, said means being automatically releasable in its entirety from said under body, and means disposed under said bed and utilizing relative rotative movement between said bearing members and said bed for opening said gates.

15. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, bearing members pivotally connected to said bed and adapted to rest on said under body, said bearing members being separable from said under body, an arm extending from each of said bearing members, and links connecting said arms with said gates.

16. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, bearing members pivotally connected to said bed and adapted to rest on said under body, an arm extending from each of said bearing members, links pivotally connected to said gates, and knuckle joints between said links and said arms.

17. In a dump car, the combination of an underframe, a tilting bed, fulcrum supports fixedly secured to said underframe and fulcrums fixedly secured to said bed, said fulcrums and fulcrum supports being spaced laterally from the longitudinal medial plane of the car, said fulcrums adapted to engage said fulcrum supports to hold said bed in substantially stable equilibrium, said bed tilting to dumping position at either side of the car about said fulcrums and fulcrum supports, side gates connected with opposite sides of said bed and adapted to swing outward and downward from their closed positions, a separate gate controlling mechanism for each gate, each of said gate controlling mechanisms comprising a pivoted member individual to each gate pivotally mounted on said bed on an axis intermediate the longitudinal medial plane of the bed and the gate controlled by that pivoted member, the relative angular position between said bed and said pivoted member controlling the position of said gate, locking jaws on the inner portions of said pivoted members, and locking devices on said underframe for each of said locking jaws, the locking jaw on the pivoted member at the dumping side of the bed engaging its associated locking device for controlling the position of the dumping gate, and the locking jaw on the pivoted member at the rising side of the bed separating from cooperative relation with its associated locking device on the underframe, said latter pivoted member maintaining the gate at the rising side of the bed closed during dumping.

18. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, a pair of laterally spaced rockers secured to said bed, bearing members pivotally mounted on said rockers and adapted to seat in sockets on said under body, an arm extending from each of said bearing members, links pivotally connected to said gates, pivots connecting said links with said arms, and means limiting pivotal movement between each of said arms and its associated link in one direction.

19. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, rockers secured to said frame at laterally spaced points, wedge shaped bearing members pivotally supported on said rockers and adapted to seat in V-shaped sockets in said under body, a link arm extending from each of said bearing members, and links connecting said link arms with said gates.

20. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, bearing members pivotally connected to said bed and adapted to rest on said under body, shoulder means on each of said bearing members adapted to engage shoulder means on said under body for preventing rotative movement of said bearing members when resting on said under body, and link mechanism utilizing the relative rotative movement between said bed and one of said bearing members for opening the gate at the dumping side of said bed when the latter is tilted to dumping position.

21. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, brackets secured to said bed, bearing members pivotally mounted on said brackets and adapted to rest on said under body, a shoulder on each of said bearing members adapted to engage shoulders on said under body to prevent rotation of said bearing members when resting on said under body, an arm extending from each bearing member, and links pivotally connecting said arms with said gates.

22. In a dump car, the combination of an underframe, a tilting bed, fulcrum supports fixedly secured to said underframe and fulcrums fixedly secured to said bed, said fulcrums and fulcrum supports being spaced laterally from the longitudinal medial plane of the car, said bed tilting to dumping position at either side of the car about said fulcrums and fulcrum supports, side gates connected with opposite sides of said bed and adapted to swing outward and downward from their closed positions, a separate gate controlling mechanism for each gate, each of said gate controlling mechanisms being disposed below the load carrying plane of the bed and comprising a pivoted member pivotally mounted on said bed on an axis intermediate the longitudinal medial plane of the bed and the gate controlled by that pivoted member, a locking formation on each of said pivoted members, and locking devices on said underframe for each of said locking formations, the locking formation on the pivoted member at the dumping side of the bed engaging its associated locking device, and the locking formation on the pivoted member at the rising side of the bed separating from cooperative relation with its associated locking device on the underframe, said latter pivoted member maintaining the gate at the rising side of the bed closed during dumping.

23. A dump car, comprising a bed adapted to tilt laterally in either direction from its normal position, an under body, laterally spaced fulcrums for said bed, stationary fulcrum supports at opposite sides of said under body for receiving said fulcrums, the fulcrum support at the dumping side of the car holding its fulcrum against lateral movement when the bed moves relatively to the under body, side gates for said bed mounted to swing outward and downward from their closed position, and a separate gate controlling mechanism for each gate disposed entirely under said bed and including a member adapted to have operative connection with the under body solely at that side thereof on which the gate is disposed for holding said member substantially stationary at the dumping side in the dumping operation.

24. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an underbody, laterally spaced fulcrums for said bed, stationary fulcrum supports at opposite sides of said underbody for receiving said fulcrums, the fulcrum support at the dumping side of the car holding its fulcrum against lateral movement when the bed moves relatively to the underbody, side gates for said bed, and a separate gate controlling mechanism for each gate adapted to have operative, separable connection with the underbody solely at

that side thereof on which the gate is disposed, and operating to move the gate at the dumping side from open to closed position in the righting of the bed, each of said gate controlling mechanisms having all parts thereof remaining below the load carrying surface of the bed in the different positions of the bed.

25. In a dump vehicle, a frame, a dump body tiltable for dumping at either side about widely spaced fulcrums, downfolding side doors pivoted to said body at each side thereof, gravity held locking means for each door connected to said body and the respective door to hold the door at the rising side of the body closed while the body is being tilted about the fulcrum on the side opposite said door, means on the frame to release said holding means when the body turns about the fulcrum at the side adjacent said door, said gravity held locking means including means for moving the door at the dumping side of the body from open to closed position in the righting of the body.

26. In a dump car, the combination of an underframe, a car body rockable selectively about fulcrums at opposite sides of said underframe, a side door for said body pivoted thereto at each side thereof, a door controlling member for each door including a member secured to said body at the side adjacent the door controlled thereby and contained entirely between the longitudinal medial plane of the car and the door controlled thereby, the member controlling the door at the lower side of the tilted car body maintained in engagement with and in substantially fixed relation with the underframe while the member controlling the door at the other side remains in substantially fixed relation with the car body, so that the door at the upper side of the car body is maintained closed during dumping.

27. A dump car comprising an under body, laterally spaced fulcrum supports on said under body, a car bed, laterally spaced fulcrums on said bed operative to engage said fulcrum supports to hold the bed in substantially stable equilibrium, said bed tilting to dumping position about stationary axes defined by said fulcrums and fulcrum supports, side gates connected with opposite sides of said bed and adapted to swing outward and downward from their closed positions, and controlling mechanism for each gate comprising a member supported independently of the under body and pivotally connected with the side portions of the bed to swing therewith at the rising side of the bed, means on the under body at the dumping side thereof engaged by said member to hold the outer end thereof substantially stationary in the dumping operation, and means disposed below the plane of the load carrying surface of said bed and effective between the outer end of said member and the adjacent gate for controlling said gate.

28. A dump car comprising an under body, a car bed, laterally spaced fulcrum supports fixedly secured to said under body, fulcrums mounted in laterally fixed relation on said bed, said fulcrums adapted to engage said fulcrum supports to hold said bed in substantially stable equilibrium, said bed tilting to dumping position at either side of the car about laterally spaced stationary axes defined by said fulcrums and fulcrum supports, side gates connected with opposite sides of said bed and adapted to swing outward and downward from their closed positions, and a mechanism for controlling each gate disposed entirely at the same side of the bed as the door controlled thereby and below the plane of the load carrying surface of the bed, each mechanism comprising a member supported independently of the under body and pivotally connected with the bed, and means on the under body at the dumping side thereof engaged by said member to hold the outer end thereof substantially stationary in the dumping operation for controlling the movement of the gate at the dumping side of the car.

29. In a dump car, the combination of an underframe, a tilting bed, laterally spaced fulcrum supports fixedly secured to said under frame, fulcrums mounted in laterally fixed relation on said bed, said bed tilting to dumping position at either side of the car about laterally spaced stationary axes defined by said fulcrums and fulcrum supports, a side gate for said bed pivoted thereto at each side thereof, a gate controlling mechanism for each gate contained entirely between the longitudinal medial plane of the car and the door controlled thereby, each of said gate controlling mechanisms including a member which, in the case of the mechanism controlling the gate at the lower side of the tilted bed is maintained in engagement with and in substantially fixed relation with the underframe for controlling the gate at the dumping side, while the corresponding member in the case of the mechanism controlling the gate at the other side remains in substantially fixed relation with the bed, so that the gate at the upper side of the bed is maintained closed during dumping.

30. In a dump car, the combination of an underframe, a tilting bed, laterally spaced fulcrum supports fixedly secured to said underframe, fulcrums mounted in laterally fixed relation on said bed, said fulcrums adapted to engage said fulcrum supports to hold said bed in substantially stable equilibrium, said bed tilting to dumping position at either side of the car about laterally spaced stationary axes defined by said fulcrums and fulcrum supports, a side gate for said tilting bed at each side thereof, and independent controlling mechanisms for each gate connected to said tilting bed, located beneath the same, separable from the underframe, and extending from one side of the longitudinal medial plane through the car to the adjacent gate for independently and selectively moving said respective gates from opened to closed position during the return of the bed from tilted position.

31. A dump car comprising an under body, a car bed, laterally spaced fulcrum supports fixedly secured to said under body, fulcrums mounted on said bed in laterally fixed relation thereto, said bed tilting to dumping position at either side of the car about laterally spaced stationary axes defined by said fulcrums and fulcrum supports, side gates pivotally connected adjacent to their lower edges to said bed to swing outward and downward from their closed position, and toggle devices supported independently of the under body, and remaining below the load carrying surface of the bed in the different positions of the bed, said toggle devices being connected with the bed to swing therewith for holding the gate at the high side closed during dumping, and for moving the gate at the dumping side to closed position during righting to the bed.

32. A dump car comprising an under body, a car bed, laterally spaced fulcrum supports fixedly secured to said under body, fulcrums mounted

in laterally spaced relation on said bed, said fulcrums adapted to engage said fulcrum supports to hold said bed in substantially stable equilibrium, said bed tilting to dumping position at either side of the car about laterally spaced stationary axes defined by said fulcrums and fulcrum supports, side gates pivotally connected adjacent to their lower edges to said bed to swing outward and downward from their closed position, toggle devices supported independently of the under body, and pivotally connected with the bed and adapted to swing therewith at the rising side of the bed for holding the gate at the high side closed during dumping, and means coacting between said toggle devices and said under body for causing said toggle devices to move the gate at the dumping side from open to closed position during righting of the bed.

33. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body, laterally spaced fulcrum supports fixedly secured to said under body, fulcrums mounted in laterally fixed relation on said bed, said fulcrums adapted to engage said fulcrum supports to hold said bed in substantially stable equilibrium, said bed tilting to dumping position at either side of the car about laterally spaced stationary axes defined by said fulcrums and fulcrum supports, side gates for said bed connected thereto to swing outward and downward from their closed positions, and separate toggle mechanisms for each gate operative to control the opening and closing movements of the gate at the dumping side of the car, each of said toggle mechanisms being supported independently of the under body and having the outer end portion thereof connected to swing upward with the bed for holding the gate at the high side closed during tilting.

34. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body, laterally spaced fulcrums on said bed, laterally spaced stationary fulcrum supports on said under body, said fulcrums normally engaging said fulcrum supports to hold the bed in stable equilibrium, each of said lateral fulcrums in its rocking movement on the cooperating lateral fulcrum support being held against lateral motion relatively to the under body, side gates for said bed mounted to swing outward and downward from their closed positions, and a separate toggle mechanism for each gate operative to move the gate at the dumping side from open to closed position during the righting of the bed, each of said mechanisms being pivotally supported on the bed and adapted to have operative connection with the under body solely on that side thereof on which its gate is disposed.

35. A dump car comprising an under frame, a bed adapted to tilt in either direction from its normal position about laterally spaced fulcrums relative to said under frame, side gates for said bed mounted to swing outward and downward from their closed position, toggles adapted to hold said gates closed, each of said toggles comprising inner and outer links, and means engaging between the underframe and the inner link of the toggle for holding said inner link substantially stationary at the dumping side of the car to break the corresponding one of said toggles to permit the gate at the dumping side to open upon the tilting of the bed to discharge its load at either side of the car, and to operate through said toggles for causing the gate at the dumping side to move to closed position in the righting of the bed.

36. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an under body on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, toggles connected with the side portions of the bed adapted to hold said gates closed when they are moved upward from their normal position, means mounted on the under body at opposite sides of the car and independent of the toggles operating to break said toggles to permit the gate at the dumping side to open upon the tilting of the bed in either direction, and to operate through said toggles for causing the gate at the dumping side to move to closed position in the righting of the bed.

37. A dump car comprising an under frame, a bed adapted to tilt about laterally spaced fulcrums relative to said under frame, said bed being normally supported in stable equilibrium on said fulcrums, a side gate for said bed mounted to swing outward and downward from its closed position, a toggle adapted to hold the gate closed when the bed is tilted in one direction, and means on the under frame operating to break said toggle and to hold the inner link thereof substantially stationary to permit the gate to open upon tilting of the bed in the opposite direction.

38. A dump car comprising an under frame, a tilting bed mounted on said under frame and adapted to rock to dumping position about two rocking fulcrums spaced laterally from the center of said bed and fixedly secured thereto, side gates connected with opposite sides of the bed to swing downwardly into open position, and gate operating mechanism comprising outer links operatively connected with each of said gates, inner links mounted at their inner ends on the side portions of the bed and pivotally connected at their outer ends with said outer links, stop means for limiting the relative pivotal movement between said links in one direction, and means operating through said links for causing the gate at the dumping side of the car to move from open to closed position as the bed is righted.

39. A dump car comprising an under frame, a tilting bed mounted on said under frame for lateral dumping movement in either direction, laterally spaced fulcrum members fixedly secured to said bed and on which said bed is adapted to tilt, side gates connected with opposite sides of the bed to swing downwardly into open position, and gate operating mechanism for each gate comprising an outer link operatively connected with its associated gate, an inner link pivotally connected at one end to said outer link, means pivotally supporting the other end of said inner link on an axis substantially coincident with the axis of one of said laterally spaced fulcrum members, stop means for limiting the relative pivotal movement between said links in one direction, and means effective between said inner links and the underframe for holding the inner link stationary at the dumping side of the car.

40. In a dump vehicle, a frame, a dump body tiltable for dumping at either side about rocking fulcrums spaced laterally from the center of said under frame, said body being normally held in stable equilibrium by said fulcrum, downfolding side doors pivoted to said body at

each side thereof, gravity held locking means pivotally connected to said body and the respective door to hold said door closed while the body has been tilted about the fulcrum on the side opposite said door, and means on the frame to release said holding means when the body turns about the fulcrum at the side adjacent said door, and to cause said holding means to close the door at the dumping side in the righting of the bed.

41. In a dump vehicle, a frame, a dump body tiltable for dumping at either side about fulcrums on said frame spaced laterally from the longitudinal center thereof, said fulcrums being operative to hold said body in substantially stable equilibrium, downfolding side doors pivoted to said body at each side thereof, gravity held toggle means connected to said body and the respective door to hold said door closed while the body has been tilted about the fulcrum on the side opposite said door, and means on the frame at the dumping side thereof operative to hold part of the toggle means stationary to release said toggle means to permit the door at the dumping side of the body to open, and to cause said toggle means to close the door at the dumping side in the righting of the body.

42. In a dump vehicle, a frame, a dump body tiltable for dumping at either side about fulcrums on said frame spaced laterally from the longitudinal center thereof, downfolding side doors pivoted to said body at each side thereof, gravity held locking means connected to the side portions of said body and the respective door to hold said door closed while the body has been tilted about the fulcrum on the side opposite said door, said gravity held holding means remaining below the plane of the load carrying surface of said body in the different positions of said body, and means on the frame at the dumping side thereof to release said holding means to permit the door at the dumping side of the body to open, and to cause said holding means to close the door at the dumping side in the righting of the bed.

43. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an underbody, laterally spaced fulcrums for said bed, laterally spaced stationary fulcrum supports on said underbody cooperating with said laterally spaced fulcrums, said fulcrums and fulcrum supports being operative to hold said bed in substantially stable equilibrium, the lateral fulcrum support at the dumping side of the car operating to hold its cooperating fulcrum against lateral motion relatively to the underbody in the rocking movement of said fulcrum on said support, side gates for said bed mounted to swing outward and downward from closed positions, and a separate gate controlling mechanism for each gate disposed entirely below the plane of the load carrying surface of said bed and adapted to have separable operative connection with the underbody, solely at that side thereof on which the gate is disposed, said gate controlling mechanism associated with the gate at the rising side of the bed positively holding said gate closed in the tilting of the bed to dumping position, and said gate controlling mechanism associated with the gate at the dumping side of the bed positively closing said gate in the righting of the bed.

44. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, and underbody, laterally spaced fulcrums on said bed, laterally spaced stationary fulcrum supports on said underbody, the lateral fulcrum support at the dumping side of the car operating to hold its cooperating fulcrum against lateral motion relatively to the underbody in the rocking movement of said fulcrum on said support, side gates for said bed mounted to swing outward and downward from their closed positions, and a separate gate controlling mechanism for each gate pivotally mounted on the side portions of the bed adjacent to said gate and adapted to have separable operative connection with the underbody solely at that side thereof on which the gate is disposed, each gate controlling mechanism comprising means whereby in the tilting of the bed toward dumping position the gate at the rising side is positively held closed against dumping of the load and the gate at the dumping side is automatically permitted to open with a gradual movement and is positively moved to closed position when the bed is righted.

45. A dump car comprising an underbody, a car bed mounted on said underbody and adapted to tilt to dumping position at either side of the car about rocker fulcrums spaced laterally from the longitudinal center of said underbody, side gates connected with opposite sides of said bed and adapted to swing outward and downward from their closed positions, and gate controlling mechanisms pivotally mounted on the side portions of the bed and comprising means movable by the tilting thereof into and out of automatic locking engagement with the underbody, the gate controlling mechanism associated with the gate at the rising side of the bed positively holding said gate closed in the tilting of the bed to dumping position, and the gate controlling mechanism associated with the gate at the dumping side of the bed positively closing said gate in the righting of the bed.

46. A dump car comprising a bed adapted to tilt laterally in either direction from its normal position, an underbody on which said bed is supported, side gates for said bed mounted to swing outward and downward from their closed position, pivot members mounted on the side portions of the bed intermediate the longitudinal medial plane of the bed and the side edges thereof, toggles pivotally mounted on said pivot members and operative to hold said gates normally closed and to close the gate at the dumping side of the car in the righting of the bed, and means operating to break said toggles to permit the gate at the dumping side to open upon the tilting of the bed to discharge its load at either side of the car, said toggles being arranged to swing upward from their normal position independently of said toggle breaking means.

47. Mechanism for operating a gate pivoted to a body tiltably mounted above cross members resting on a vehicle frame, said gate having a projection extending below its pivotal axis, said mechanism comprising a link pivoted to the downward projection on said gate, a bearing extending downwardly of the body, a shaft on said bearing, a crank on said shaft pivoted to said link, an arm on said shaft rigid with said crank, and means fixed relative to one of said cross members and free of said arm for engaging said arm to control operation of the gate on a movement of the body, said arm being free to move away from said fixed means.

48. In a dump car, the combination of an under frame, a tilting bed adapted to dump to

either side of the car, mounting means between said bed and said under frame normally holding said bed to a position of substantially stable equilibrium on said under frame and comprising means operative to establish a laterally disposed fixed fulcrum axis around which substantially the entire tilting motion of the bed occurs in a dumping operation to either side of the car, side gates for said bed at each side thereof, and independent devices for each gate connected to said tilting bed, located beneath the same and extending from one side of the longitudinal medial plane through said under frame to the adjacent gate for independently and selectively moving said respective gates from opened to closed position during the return of said bed from tilted position.

49. In a dump car, the combination of an under frame, a tilting load carrying bed adapted to dump to either side of the car, mounting means between said bed and said under frame normally holding said bed to a position of substantially stable equilibrium on said under frame and comprising cooperating pivot members establishing a laterally disposed fixed pivot axis around which substantially the entire tilting motion of the bed occurs in a dumping operation to either side of the car, said pivot members preventing sidewise translatory motion of the bed in its tilting movement around said pivot axis, side gates for said bed at each side thereof, and a seperate gate controlling mechanism for each gate adapted to have operative, separable connection with the under frame solely at that side thereof on which the gate is disposed, and operating to move the gate at the dumping side from open to closed position in the righting of the bed, each of said gate controlling mechanisms having all parts thereof remaining below the load carrying surface of the bed in the different positions of the bed.

50. Mechanism for operating oppositely disposed gates pivoted to each side of a dumping body tiltably mounted above cross members resting on a vehicle frame, said body being adapted for dumping movement to either side of the vehicle, each of said gates having a projection extending below its pivotal axis, said mechanism comprising a link pivoted to the downward projection on each gate, spaced bearings extending downwardly of the body, a shaft carried by each of said bearings, a crank on each of said shafts pivoted to a respective one of said links, an arm on each of said shafts rigid with a respective one of said cranks, and means fixed relative to one of said cross members for effecting engagement with said arms to control operation of said gates on dumping movements of said body, each arm being free to move away from said fixed means at the rising side of said body in a dumping operation.

JOSEPH H. SLAKER.

CERTIFICATE OF CORRECTION.

Patent No. 2,181,629. November 28, 1939.

JOSEPH H. SLAKER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, first column, line 27, claim 8, for the word "mechanism" read mechanisms; line 32, for "established" read establishing; and second column, line 28, claim 13, for "suported" read supported; page 6, second column, line 72, claim 31, for "to the bed" read of the bed; page 7, second column, line 74, claim 40, for "fulcrum" read fulcrums; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of January, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)