

No. 721,323.

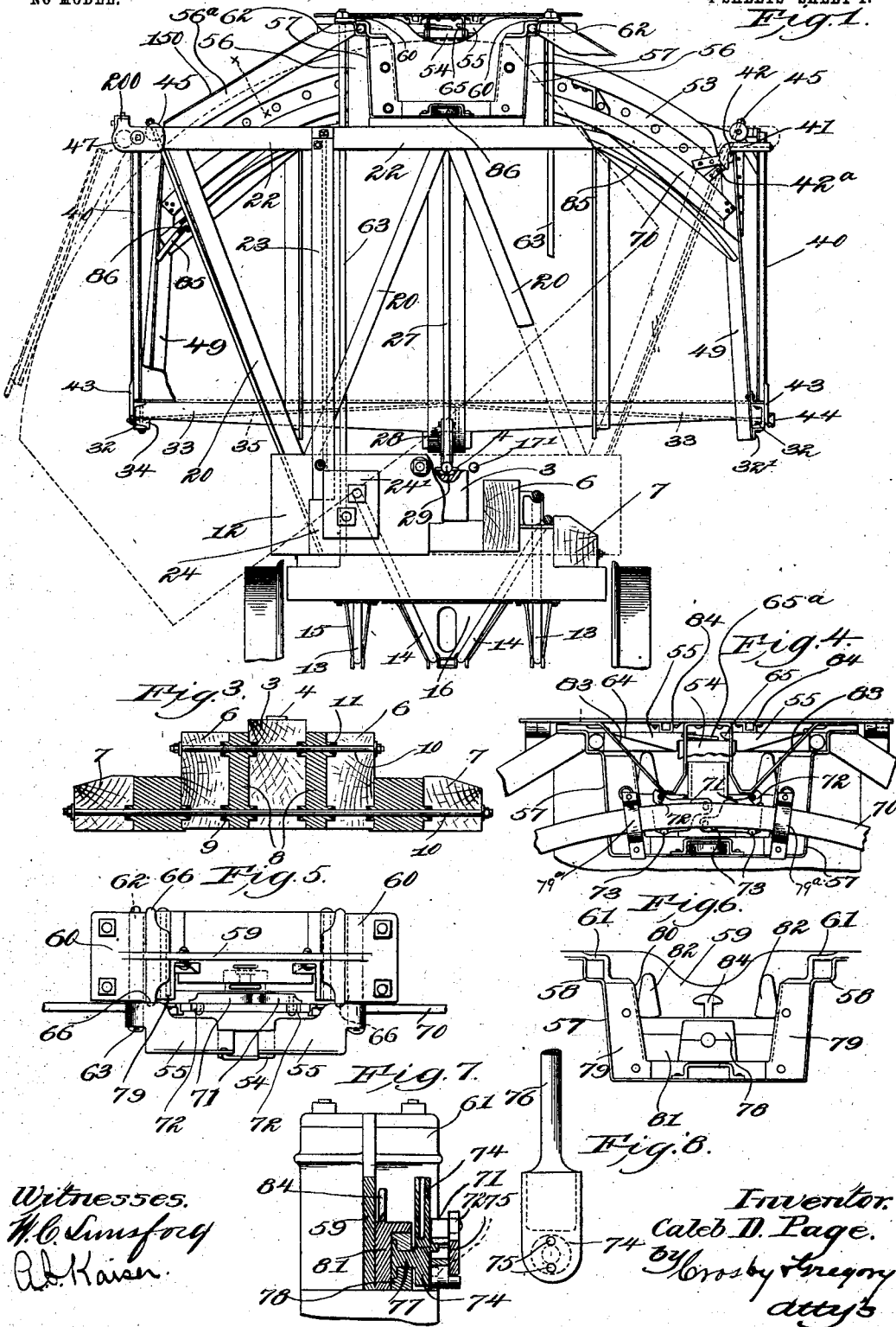
PATENTED FEB. 24, 1903.

C. D. PAGE.
DUMPING CAR.

APPLICATION FILED SEPT. 30, 1901.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses.
H. C. Simpford
A. Kaiser.

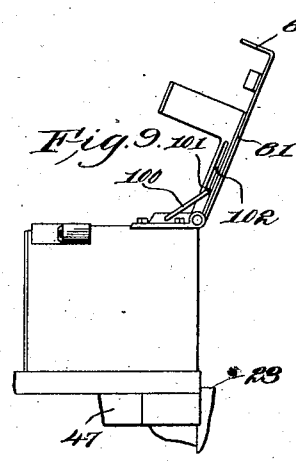
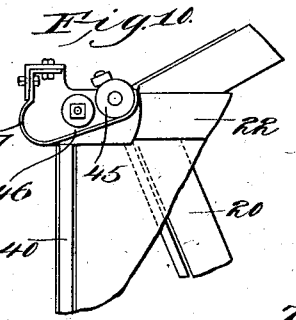
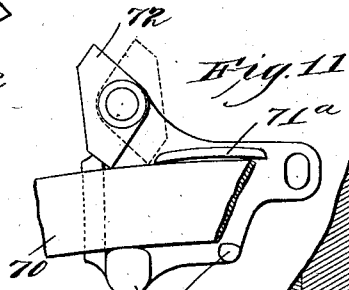
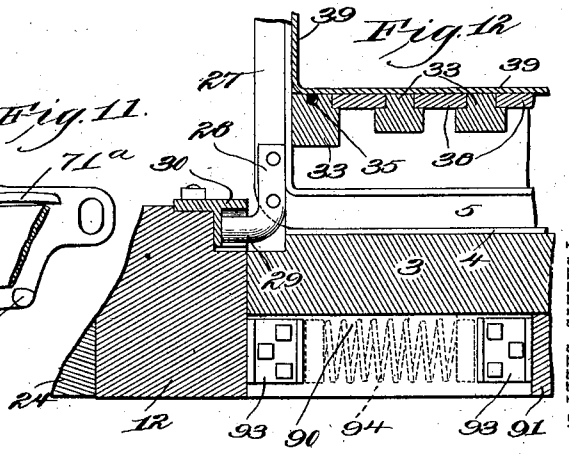
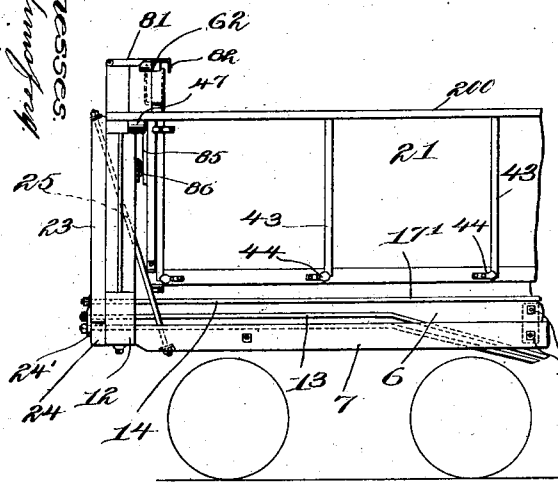
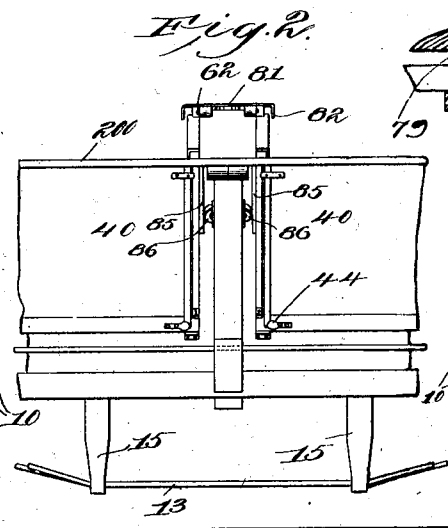
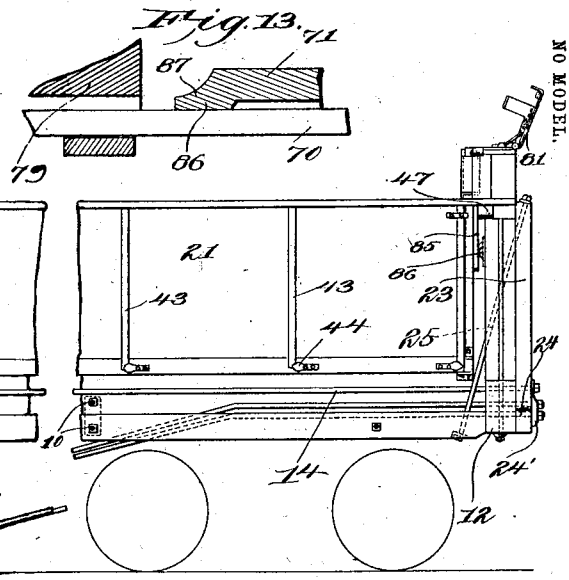
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O. D. PAGE,
DUMPING CAR.

APPLICATION FILED SEPT. 30, 1901.

NO MODEL.

4 SHEETS—SHEET 2.



Witnesses:
H. G. King
C. J. ...

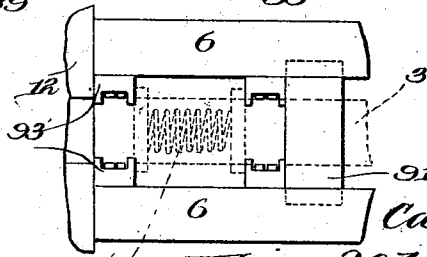
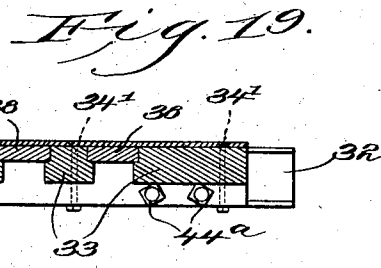
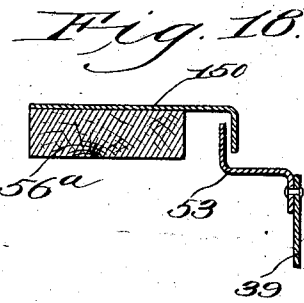
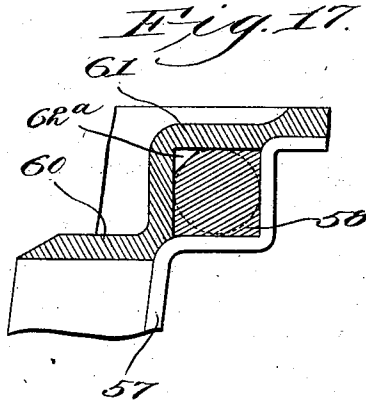
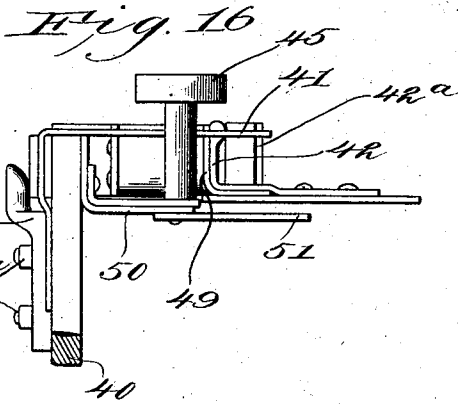
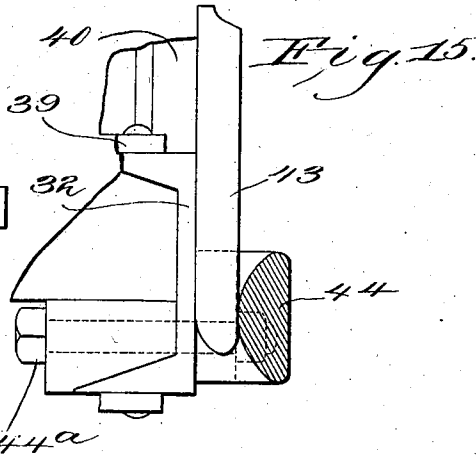
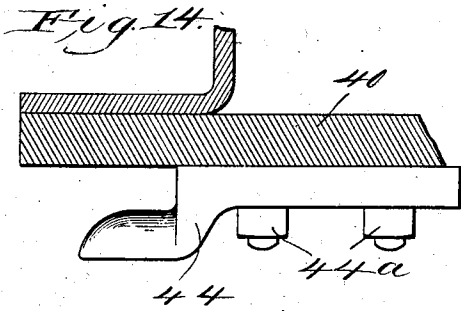
Inventor:
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C. D. PAGE.
DUMPING CAR.

APPLICATION FILED SEPT. 30, 1901.

NO MODEL.

4 SHEETS—SHEET 3.



Witnesses.
 W. C. Sunsford
 A. H. Kaiser

Inventor.
 Caleb D. Page.
 64 Fig. 20. by *bristly & inquiry*
atly's

No. 721,323.

PATENTED FEB. 24, 1903.

C. D. PAGE.
DUMPING CAR.

APPLICATION FILED SEPT. 30, 1901.

NO MODEL.

4 SHEETS—SHEET 4.

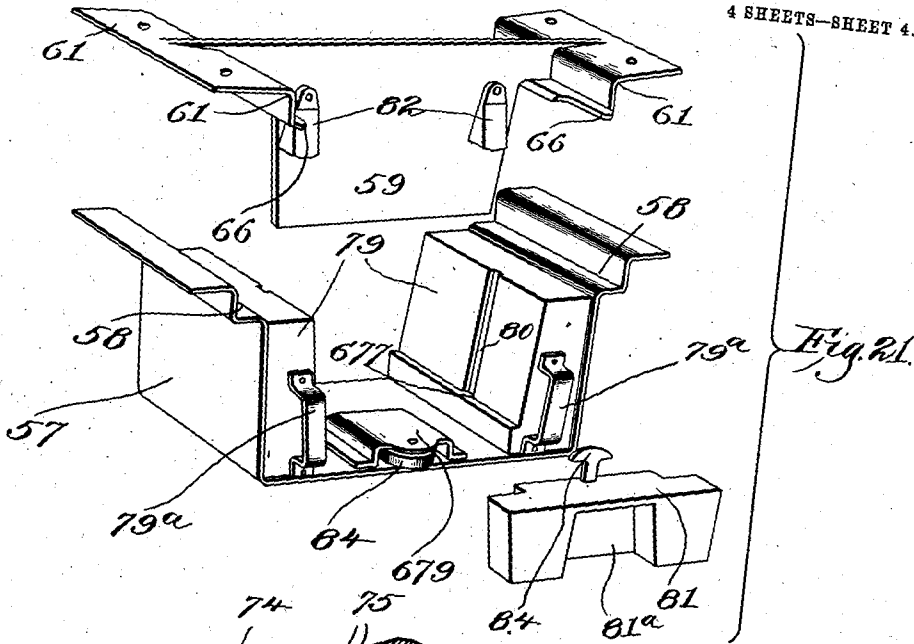


Fig. 21.

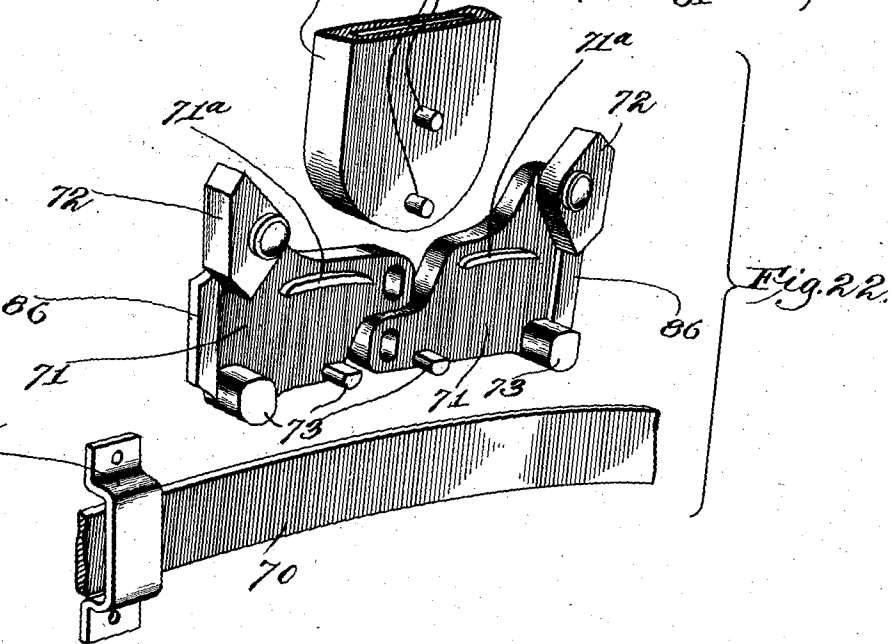


Fig. 22.

*Presses:
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Sartoris.*

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UNITED STATES PATENT OFFICE.

CALEB D. PAGE, OF GREELEY, COLORADO, ASSIGNOR TO PAGE CAR COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 721,323, dated February 24, 1903.

Application filed September 30, 1901. Serial No. 76,991. (No model.)

To all whom it may concern:

Be it known that I, CALEB D. PAGE, a citizen of the United States, and a resident of Greeley, county of Weld, State of Colorado, have invented an Improvement in Dumping-Cars, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to dumping-cars, and is an improvement on the invention described and claimed in my Patent No. 559,402, dated May 5, 1896. In that patent is illustrated a dumping-car comprising a body mounted on suitable trucks, which body has, rising from either end thereof, vertical frames, between which the tilting box of the car is pivoted. An axis-bar in the form of a T-bar or other suitably-shaped iron is secured to the bottom of the box and extends longitudinally thereof at its central portion, and the vertical flange of the T or other angle iron rests upon the base portion of the body of the car and forms a rocking support for the tipping box. While the car illustrated in said patent is suitable for cars of small carrying capacity, I have found that in order to adapt the features of my former invention to cars of the standard size, such as are used on steam-railways, several changes in construction become necessary. Accordingly I have constructed a car-body with the vertically-arranged frames between which the tipping boxes are pivotally mounted and have provided means for longitudinally bracing the frames in order to strengthen the car. I have also devised a novel form of lock for locking the box of the car in its vertical position and have employed a novel form of jack for turning the car about its axis to dump the same.

My invention also comprises various other features, which will be more fully hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is an end view of my improved car, showing a portion of the end frame of the body broken out to better show the construction of the box. Fig. 2 is a side elevation of my improved car. Fig. 3 is a cross-sectional view of the sills of the car-body. Figs. 4, 5, 6, 7, and 8 are details of the jack for turning the car. Fig. 9 is a de-

tail of the shield. Fig. 10 is a detail of the track for supporting the doors. Fig. 11 is an enlarged detail of a portion of the jack. Fig. 12 shows the pivotal connections at one end of the box. Fig. 13 is a detail of the brake mechanism. Figs. 14 and 15 are enlarged views of the keepers, which engage the straps on the door. Fig. 16 is a top plan view of a corner of the door and the box end. Fig. 17 shows one way of securing the latch projections in position. Fig. 18 is a view of the fixed shield on line *x x*, Fig. 1. Fig. 19 is a detail of floor construction, and Fig. 20 is a detail of the draft mechanism. Figs. 21 and 22 are views showing the different parts of the jack mechanism in perspective and separated from each other.

The body of the car comprises the base, upon which the tipping boxes are pivotally supported, as hereinafter described, and the vertical frames, between which the boxes are received, as in my former patent.

The base of the car-body comprises the central sill 3, running longitudinally of the car and having secured thereto the metallic plate 4, upon which the thin edge of the longitudinally-extending T-bar 5, secured to the under side of the car-body, rests, as in my before-mentioned patent, the two draw-sills 6, which are parallel to the center sill 3 and also extend the full length of the car-body, the said draw-sill having the draft devices connected thereto, as will be hereinafter described, and the outside sills 7, also extending lengthwise of the body. Inasmuch as in this type of car the entire weight of the tipping box and the load is supported by the center sill 3, I prefer to tie the center sill to the draft and side sills of the body, so that any strain to which the center sill is subjected by reason of the load will be partially borne by the other sills.

As illustrated in Fig. 3, suitable metallic spacing-blocks 8 are placed at intervals between the adjacent sills; the said spacing-blocks preferably having bosses 9 extending from opposite sides thereof, which bosses are received in suitable recesses in the sills, whereby the sills and spacing-blocks are interlocked together.

In order to tie the sills together, the trans-

versely - extending tie - rods 10 are passed through the sills and through the spacing-blocks 8, the said tie-rods preferably passing through the bosses of the spacing-blocks, as shown in the drawings. Preferably the said bosses will have the openings therethrough tapered, as seen at 11, Fig. 3, in order to assist in inserting the tie-rods 10. As seen in Fig. 3, the upper tie-rod passes through the center sill and the draft-sills 6, while the lower tie-rod passes through all of the five sills forming the body.

I will place the spacing-blocks at intervals throughout the car, as seen in Fig. 2, the number of blocks depending somewhat upon the length of the car.


Secured to the end of the longitudinally-extending sills of the body are the transverse end sills 12, and to stiffen the body the truss-rods 13 and 14 are provided, the said truss-rods 13 being carried over vertically-extending queen-posts 15, while the truss-rods 14 are carried toward the center of the car at their central portion and are supported upon the central queen-posts 16. The end sills of the body are further tied together by the longitudinally-extending tie-rods 17', as seen in Fig. 2, said tie-rods being preferably situated either side of and adjacent the trunnions of the boxes (hereinafter described) to prevent the bearings for said trunnions from separating. The car-body is therefore trussed both longitudinally and transversely and is better adapted to withstand the strain incident to tipping the boxes. Each end of the center sill is cut away, as at 90, and in said cut-away portion is placed a cross-piece 91, which is secured at its ends to the draft-sills and which forms with the end sill a draft-spring pocket, in which the usual draft - bar stops 93 and draft-spring 94 are located.

In this embodiment of my invention I have illustrated a car-body adapted to support two tipping boxes, though I desire it understood that my invention also contemplates a car having only one tipping box or more than two, if desired.

When the car is constructed with two tipping boxes, as illustrated, the base or sill portion of the body has rising from each end thereof and also from the central portion thereof the transverse vertical frames between which the tipping boxes 21 are supported. The said frames may be of any suitable shape, and they are illustrated as comprising the inclined struts 20, connected at their lower end to the end sill 12 of the body, and the cross-piece 22, upon which the latches to hold the tipping boxes in their vertical position and the jack, hereinafter described, are supported.

Where the car is made of the standard size used on steam-railways, it has been found necessary to brace the vertical frames to restrain them against longitudinal movement and prevent them from racking, and I therefore secure to the outside of said frames the

vertical posts 23, which rest at their lower ends upon the dead-wood 24, said posts being held in place by the plates 24', through which the truss-rods 13 and 14 pass. A diagonal brace-rod 25 connects the upper end of the posts 23 with the sill portion of the body, said diagonal brace being so inclined as not to interfere with the swinging motion of the box, but operating to hold the said frames against longitudinal strain. By tightening up the nuts upon the ends of said braces the said frames may be maintained taut. The frames may be further braced by the longitudinal tie-bars 200, which are shown as angle-iron pieces extending the length of the body and connected to the ends of the cross-pieces 22.

Each tipping box 21 has extending longitudinally beneath the same and secured thereto an axis-bar, shown as the T-iron 5, as in my above-mentioned patent, and which forms a rocking support for the box, and in order to strengthen the box against torsional strain I may bend the said T-iron vertically upward at the ends of the box, as at 27, to form a center post, which is riveted to the box end, or I may make said center post separate from the axis-bar 5 and rigidly secure the latter to the lower end of the post by any suitable means. In order to hold the box in its position on the sill portion of the frame, I have illustrated trunnion-pieces 28, which are secured in any suitable way to the T-bar 5 at the ends of the box and which carry the trunnions 29, situated in the line of the axis of the box, the said trunnions projecting beyond the ends of the box, as illustrated in Fig. 12, and being received by hoods 30, which are secured to the end sills 12. The hoods 30, which receive the trunnions 29, serve to maintain the tipping boxes in their proper position while the boxes tip or rock about the lower edge of the T-bar 5. The boxes 21 have extending longitudinally thereof at their lower corners the channel-irons 32, which receive the ends of the cross or floor sills 33, and by the term "channel-iron" as herein used I mean a beam or girder having a general  shape regardless of the particular metal of which it is composed. Preferably I support upon the lower flange of each channel-iron a sill-support 34, which is slightly wedge-shaped, and confine the ends of the floor-sills 33 between said sill-support and the upper edge of the channel-iron, the said channel-irons being tied together by the transverse tie-rods 35. (Shown in dotted lines, Fig. 1.) The said sill-support may be held in position in any suitable way, as by vertical tie-bolts 34'. As illustrated, the said tie-rods 35 have their ends secured to the channel-irons near the lower edges thereof and are deflected upward in their central portion, whereby the said tie-rods have the function to some extent of a truss-rod.

As illustrated in Fig. 12, the floor-sills 33 are rabbeted out at their upper corners to receive the floor-boards 38, the said floor-boards

coming just flush with the top of the sills, whereby the floor of the car is composed partly of sills and partly of floor-boards. The floor thus constructed is preferably covered
 5 by a sheet-metal covering 39, which is bent upward to form the ends of the box. The ends of the box are stiffened by the corner-posts 49, preferably of angle-iron, which are riveted to the box end and are secured at
 10 their lower ends to the ends of the channel-irons 32 by means of suitable angle-pieces 32'. The upper portions of the ends of the box are stiffened by riveting thereto the curved Z-iron 53, the said Z-iron being on an arc of a
 15 circle the center of which is the axis of the box. The sides of the boxes are open, as in my above-referred-to patent, and are adapted to be closed by suitable doors 40, which may be made of any suitable material and which
 20 have extending inwardly therefrom the hooks 41, which when the door is closed engage suitable lugs 42, projecting from the side of the box end, said hooks being held against the lugs 42 by the keepers 42^a, the said keepers
 25 preventing any lateral vibration of the door. The lower portion of the door is provided with the straps 43, which pass behind the horizontally-arranged keepers 44, secured to the channel-iron beams of the box by means of bolts
 30 44^a, which bolts also pass through and help secure the sill-supports in place. Extending from the upper end of the door are projections carrying rollers 45, which are situated above an inclined track 46, supported on the
 35 ends of the cross-piece 22 of the frame. With this construction whenever the box is tilted about its axis to dump the load the rolls 45 will engage the track 46 and pass down the same until the upturned end 47 of the track is
 40 reached, at which time the hooks 41 are disengaged from the lugs 42 and the straps 43 are clear of the keepers 44, when further tipping movement will carry the box entirely away from the door, which remains suspended
 45 on the tracks, as seen in dotted lines, Fig. 1. The tracks 46 are so positioned with relation to the rolls 45 that the instant the box begins its tipping movement the rolls are brought into engagement with the tracks, and the in-
 50 clination of the said tracks is such that during the first or initial tipping movement of the box the said box begins to move away from the door, the door in the meantime being carried down the inclined tracks out-
 55 wardly from the box. The inclination of the tracks, however, is not sufficient to allow of the door having as great a downward movement as the box, and consequently the door begins to separate from the box the instant
 60 that the box begins to tip. The separation, however, is gradual until the rolls reach the lower end of the track 46, at which point the downward movement of the door ceases. After the load is dumped and when the box
 65 is returned to its vertical position the hooks 41 are automatically engaged by the lugs 42 and the straps 43 again enter the keepers 44.

I will preferably make my keepers 44 with a convex spherical inside surface, as shown
 in Figs. 14 and 15, such convex surface serv- 70
 ing to deflect any coal or other material which may be deposited on the keeper when the car is dumped, and thus preventing the said material from being crowded between the keeper and box by the strap where it reënters the
 75 keeper. This construction also enables the strap to more easily enter the keeper.

It will be seen on referring to Fig. 1 that while the door 40 is supported in a substantially vertical position the end post 49 of the
 80 box is inclined toward the center of the car at its upper end, thus leaving a triangular opening between the door and the box side. To prevent the material in the car from falling out this opening, the door has secured
 85 thereto at its ends the vertical angle-iron 50, one flange of which is sufficiently wide to substantially close the said triangular opening, and in order to fully close the same at the upper end I may, if desired, rivet to the angle-
 90 iron the triangular filling-piece 51.

The purpose of spacing the door at its upper end from the top of the box is to reduce the friction between the box and the door as
 95 the said box tips to dump the load, for with the construction shown it will be seen that as the car tips the upper corner of the box will strike the door on an incline and gradually crowd the latter outward, the top of the box
 100 ends riding against the angle-iron 50 on the door. This construction obviates the danger of the upper end of the box binding against the door, as would be the case if the box side were parallel to the door.

In order to hold the car tightly in its verti- 105
 cal position, I find it is desirable to place the latches as near together as possible, so that any loose play due to shrinkage of the framework of the car will affect the operation of the latches as little as possible. Accordingly
 110 I have provided the ends of each box, at their upper sides and centrally thereof, with the offset or projection 54, preferably of metal, and I pivot to the frames of the car-body, in a
 115 manner hereinafter described, the oppositely-disposed latches 55, which are adapted to engage the opposite sides of the projection 54, as seen in Fig. 4. The latches, therefore, are the maximum distance away from the axis of
 120 the box, and since they both act upon the same lug or projection any shrinkage of the timbers of the car will have no appreciable effect thereon.

Referring to Fig. 1, it will be seen that extending upwardly from the cross-piece 22 of
 125 each frame are the posts 56, which are braced by the braces 56^a, the said posts receiving between them a lining member 57, of sheet metal, which is secured to said posts and cross-piece, said lining member forming a pocket in which
 130 the jack mechanism hereinafter described is mounted. The lining member 57 is provided with the angular recesses 58, and a king-piece casting having a central vertical fin or web

59, from the ends of which extend transverse flanges 60, is seated in said pocket; the said flanges 60 having the angular recessed portion 61, which forms, with the recessed portion 58 of the lining, a square aperture to receive suitable pins, to which the latches 55 are pivoted. The flanges 60 of the casting rest upon the top of the vertical frames and are held in position by means of tie-rods 63, which extend vertically of the frame and through the said flanges, the said king-piece casting thus operating to tie together the upper ends of posts 56 and being rigidly held in position by the braces 56^a. The ends of the square pins or latch-journals 62 which project beyond the casting are turned round and have supported thereon the latches 55, said latches being held in position by any suitable means, such as cotter-pins 63. Preferably the latch-journals will each be provided with a notch in which fits a fin or web 62^a on the under side of the flange 60, as seen in Fig. 17, this construction locking the said journals against longitudinal movement.

Referring to Fig. 5, it will be seen that the latches 55 are offset from their pivotal point, this being necessary in order to provide clearance room to allow the projection or lug 54 on the box to pass said pivot-pins 64 as the box tips. Each latch 55 has the under side of its offset portion tapered or inclined, as shown at 64, while the under side of the nose of the latch is inclined upwardly, as at 65. When it is desired to release either of the latches, a suitable tool may be placed beneath the inclined surface 65 of the latch-nose, when the latch may be pried up out of engagement with the lug or projection 54, and to support said latch in its disengaged position I preferably pivot to the end of the same a supporting-strut 65^a, which by its engagement with the projection 54 maintains the latch raised. When the box is being restored from its dumping to its vertical position, the projection 54 rides underneath the inclined portion 64 of the latch, thus automatically raising the latter, and when the box has assumed its normal position the latch will drop back into engagement with the projection 54 by gravity. I preferably provide the flanges 60 of the casting with the projections or stops 66, which are adapted to be engaged by the latch 55 to limit its swinging movement in either direction.

The jack mechanism which I employ to tilt the box is contained in the pocket formed by the lining 57 and operates upon a curved jack-bar 70, secured to the end of the box, said jack-bar being bent on an arc of a circle whose center is the axis of the box.

I will here remark that by the term "jack mechanism" and similar expressions as hereinafter used I mean a machine or device of that class generally referred to as "jack" and comprising a combination of simple mechanical elements whereby the power expended is multiplied in its application.

Referring to Figs. 4 to 8, inclusive, and to Fig. 21, it will be seen that the jack comprises two oppositely-disposed jaws 71, each carrying the reversible pawl 72, which is adapted to engage the upper side of the jack-bar 70, while the lower side of said jack-bar is engaged by lugs or projections 73, integral with the jaw 71. A suitable rib 71^a, projecting from the face of each jaw 71, rests on the top of the jack-bar 70 and operates to hold the jaw in operative position. The inner ends of the jaws 71 are provided with apertures which receive pins or lugs 75 upon a socket-piece 74, which is adapted to receive an operating-lever 76, the said socket-piece having projecting from the opposite side thereof the fulcrum 77, which is mounted for rotation in a split bearing 78, supported as hereinafter described. The pins 75 are on opposite sides of the fulcrum, as seen in Fig. 8, so that as the operating-lever 76 is vibrated the jaws 71 are moved toward and from each other alternately. Under normal conditions the pawls 72 will be so turned as to grip the bar when the jaws 71 are moving in the same direction, said pawls slipping over the upper surface of the bar 70 when the jaws are moved in the opposite direction. When, therefore, the left-hand jaw 71 is moved to the left—Fig. 4, for instance—the pawl 72 will grip the jack-bar 70 and carry the same with the jaw, and since the jack-bar is secured to the box end the box will be tilted about its axis. At the same time that the left-hand jaw 71 is moving to the left the right-hand jaw will be moving to the right, and when the direction of movement of the operating-lever is reversed the right-hand jaw will grip the jack-bar 70 and continue moving the same to the left, the left-hand jaw meanwhile slipping along the jack-bar. By making the pawl 72 reversible it is merely necessary to reverse their position when it is desired to tip the box to the right.

If it is desired to lock the box against movement in either direction, it is simply necessary to reverse one of the pawls, so that said pawls will be oppositely disposed, when they will operate to lock the jack-bar against movement in either direction.

Referring now to Figs. 6 and 21, it will be seen that the jack-receiving pocket contains the brake-castings 79, said castings having on their inner surfaces a suitable groove 80 to receive the outer edges of the fin 59, said interlocking connection between the casting 59 and the brake-casting 79 operating to lock the brake-casting against longitudinal movement. Each of said castings 79 has secured to its end a loop 79^a, through which the jack-bar passes and by which it is guided, as seen in Figs. 4 and 22. A removable key member 81 is situated between the castings 79, said key member being sustained upon the shoulders 677, formed in each of the castings 79. The key member 81 has formed in its side a pocket 81^a, in which the journal 77 of the jack-

lever socket is journaled. The split box 78 when in operative position rests upon and is supported by the hood or cover 679 for the guide-roll 84, to be presently described. 5 Either side of the pocket for receiving the split box 78 the said key has lateral projections which are adapted to engage the back side of the jaw 71, thus operating to hold the said jaws in their working position. To hold 10 the key in place, the casting 59 may be provided with suitable pivoted buttons 82, which when in their operative position engage the top of the key 81. If for any reason it is desired to remove the jack or any portion thereof, it is simply necessary to turn back the buttons 82, when the key 81 may be raised by means of the handle 84. After the key 81 has been removed from its position between the castings 79 the lever-socket 74 of the carrier 20 may be moved laterally or toward the fin 59 sufficiently to withdraw the pin 75 from the dogs 71, when the said socket may be removed, if necessary. It will thus be seen that my jack is not only reversible, so that the box may be tipped in either direction, but also is removable, so that jacks of different power may be employed or broken parts of the jacks may be easily replaced. The outer end of 30 each jaw 71 has the rib 86 extending transversely of the jack-bar 70 and engaging the outer face thereof, said rib having its outer face inclined, as at 87, Fig. 13. With this construction if it is found that the box tends to move faster than desired or if it is desired to stop the tipping movement of the box it is simply necessary to give the operating-lever 76 a long enough stroke so as to crowd the inclined or wedge-shaped rib 86 of the jaw 40 into the space between the jack-bar and the brake-casting 79. This operation forces the jack-bar 70 hard against the retaining-loop 79^a, and the wedge-shaped end of the jaw 71 serves to generate sufficient friction between the said jaw and jack-bar and between the jack-bar and the loop 79^a to either entirely stop the movement of the jack-bar, and consequently of the tipping box, or to bring the movement of the box under control. This device is, 50 therefore, in its broad sense a brake mechanism which is applied to the end of the box to control the movement thereof.

It will be understood that I preferably have a jack mechanism at each end of each tipping box, and therefore the jack mechanism at the central portion of the car, where there are two tipping boxes, will be duplicated, there being one jack mechanism each side of the vertical web 59 of the casting. At the ends 60 of the car, however, the jack mechanism will be situated on one side of the casting 59 only, as illustrated in Fig. 5.

To protect the working parts of the jack against injury and to prevent the same from becoming clogged with the material with which the car is being filled, I preferably employ suitable shields or covers for the

pockets, which are pivoted thereto, so as to be removed when it is desired to operate the jack. The shields or covers are designated 70 by 81 and may be pivoted in any suitable way to the end frames to swing about an axis either transverse to the car or longitudinal thereof, the said shields having the tip 82, which when the shield is closed laps over the top of the box. Referring to Fig. 4, it will 75 be seen that each shield has on its under side the W-shaped locking-piece 83, which is so shaped as to engage the pawls 72 and lock them against movement when the shield is closed. The said shield has also on its under side the lugs 84, which are so positioned as to rest on and lock the latches 55 in place when said shield is closed, as seen in Fig. 4. The shields may be held in their raised position 85 by means of the stop-rod 100, which is pivoted at one end to a fixed support and at the other end has an offset 101, which plays in a slot 102 in the shield, the said slot having at one end the offset portion or notch into which the 90 offset 101 drops when the shield is open. This construction affords a simple way of locking the shields open, in which position they serve as guards to prevent the operator who manipulates the jacks from falling. 95

I will preferably employ in addition to the pivoted shields the stationary shields 150, which are secured to the top of the braces 56^a, as seen in Fig. 18, said stationary shields covering the space between the boxes and frames not covered by the pivoted shields. 100 By placing the stationary shields on the braces 56^a they do not interfere in any way with the tipping movement of the box.

To guide each box in its tipping movement 105 I preferably secure to the ends of the same the curved track 85, which bears against anti-friction-rolls 86 on the adjacent frames. The curved tracks or guides 85 serve to hold the box ends properly in alinement, so that as the box is restored to its initial position the lugs 42 on the ends of the box are properly positioned to receive the hooks 41 on the car-door. This guide or track 85 also keeps the box end in the proper position so that the projection 110 54 is properly alined with the latches 55. 115

I desire to state that various changes may be made in the construction of my device without departing in any way from the scope of my invention and that my invention is 120 equally applicable to dumping-cars having one, two, or more tipping boxes or to dumping-wagons or self-propelling vehicles having tipping boxes thereon.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a car, a fixedly-supported body having longitudinally-braced frames rising from the ends thereof, combined with one or more tipping boxes pivotally supported on said body between said frames. 130

2. In a car, a body having two fixed frames rising from the base thereof, and a diagonal

tie brace-rod connecting each of said frames and the base portion of the body, and operating to brace said frames against longitudinal strain, combined with a tipping box pivotally supported between said frames.

3. In a car, a fixed body, having a series of frames, rising from the base portion thereof, and a diagonal brace extending from each of said frames to said base, and operating to brace said frames against longitudinal movement, combined with a tipping box supported between adjacent frames.

4. In a car, a body having a series of frames rising from the base portion thereof, and an adjustable diagonal brace extending from each of said frames to said base, and operating to brace said frames against longitudinal movement combined with a tipping box supported between adjacent frames.

5. In a car, a body comprising longitudinally-extending sills, frames rising therefrom, diagonal brace-rods connecting said frames and sills, and longitudinal tie-bars connecting said frames, combined with a tipping box pivotally mounted on said sills between said frames.

6. In a car, a body comprising a central longitudinal sill, and sills parallel to and either side thereof, a tipping box resting entirely on said central sill, and means extending transversely of the car-body and operating to rigidly tie all of said sills together.

7. In a car, a body comprising a plurality of longitudinal sills, spacing-blocks between said sills, said blocks each having bosses which are seated in recesses in the sills, and transverse tie-rods extending through said sills and blocks, combined with a tipping box supported on said sills.

8. In a car, a body having two longitudinally-braced frames rising from the base thereof, combined with a tipping box pivotally supported between said frames, and antifriction-guides between the frames and ends of the box.

9. In a car, a body having two longitudinally-braced frames rising from the base thereof, combined with a tipping box pivotally supported between said frames, guides extending across the box ends, and antifriction-rolls on the frames engaging said guides.

10. In a dumping-car, a body having vertically-disposed longitudinally-braced end frames, one or more tipping boxes between said frames, said tipping boxes each having one side open, a door to close said open side of each box, means for detachably sustaining each door from the box when said box is in its normal position, means for supporting each door on the frame as the box tips, and means to guide the box ends whereby as each box is returned to normal position the said box automatically picks the door off the frame.

11. In a car, a body having longitudinally-braced frames rising from the base thereof, a tipping box supported between adjacent

frames, the side of the boxes being removable and forming a door, projections extending from said door, and adapted to engage said frames when the box is tipped, whereby the door is withdrawn automatically.

12. In a car, a body having frames rising therefrom, an open-sided tipping box supported between said frames, a door to close the open box side, said door having projections extending from the ends thereof, inclined tracks secured to the frame, the position of the tracks being such that the initial tipping movement of the box brings the projections on the door into engagement with the tracks, and the inclination of the tracks being such that during said initial tipping movement the door is caused to move outwardly from the box whereby the door begins to open during the initial tipping movement of the box.

13. In a dumping-car, a body, an open-sided tipping box supported on said body, a door to close the open side of said box, said door being supported by the box when the latter is in its normal position, means carried by the body to support the door when the box is tipped, said means including devices to engage said door and give to the door a downward movement in a direction at an angle to the path of movement of the box as the box begins its tipping movement.

14. In a dumping-car, a body having frames rising from the base thereof, an open-sided tipping box supported between said frames, a door to close the open side of said box, means to support the door on the box when said box is in its normal position, devices on the frames to engage said door as the box begins its tipping movement, said devices operating to sustain the door while the box moves away therefrom as it tips, and to give to the door a slight downward movement as it leaves the box.

15. In a car, a body, a tipping box having a longitudinally-extended T or angle axis-bar beneath the same and centrally thereof, the vertical flange of said bar resting on the body and forming a fulcrum for the car in its tipping movement, a center post rigid with the axis-bar at each end, said center post supporting the box ends, a trunnion secured to said bar at each end of the box and in line with the box-axis, and hoods secured to the car-body and receiving said trunnions.

16. In a car, a body, a tipping box supported thereon, said box having longitudinally-extending channel-iron beams on opposite sides thereof, transverse floor-sills extending entirely across said box and having their ends connected to said channel-iron beams, and an axis-bar extending transversely of the floor-sills, said axis-bar resting upon the body and forming a fulcrum about which the box is tipped.

17. A box for a dumping-car having longitudinally-extending channel-iron beams on opposite sides thereof, transverse floor-sills

extending entirely across the box and having their ends connected to said channel-iron beams, and an axis-bar extending longitudinally of the floor-sills and forming a fulcrum about which the box is adapted to tip.

18. In a car, a box adapted to be pivoted to a car-body to turn about a longitudinal axis beneath the box, said box having longitudinally-extended channel-iron beams on opposite sides thereof, transverse floor-sills extending entirely across the box and directly connecting said channel-iron beams, and transverse tie-rods securing said beams together.

19. A box for a dumping-car having longitudinally-extending channel-iron beams on opposite sides thereof, floor-sills extending transversely of the box and supported at their ends in said beams, said floor-sills being rabbeted to receive the floor-boards, and transverse tie-rods securing said beams together.

20. A box comprising in its construction longitudinally-extending channel-iron beams on opposite sides thereof, floor-sills extending transversely of the box and supported at their ends in said channel-iron beams, and transverse tie-rods connecting the lower edges of said beams, said tie-rods being deflected upward at their center.

21. A box for a dumping-car, having channel-iron beams extending longitudinally thereof on opposite sides, a sill-support resting on the lower flange of each of said channel-iron beams and secured to the same, floor-sills extending transversely of the box, and having their ends confined between the sill-support and the upper edges of the channel-iron beams, and transverse tie-rods tying the channel-iron beams together.

22. A box for a dumping-car, having channel-iron beams extending longitudinally thereof on opposite sides, transverse floor-sills having their ends supported on said channel-iron beams, transverse tie-rods connecting said beams, a central angle or T bar extending longitudinally of the box and forming a rocking support therefor, the ends of the said bar being bent upward and secured to the box ends, and vertical metal corner-posts secured at their lower ends to the ends of the channel-iron.

23. In a dumping-car, a body, a box pivoted thereto to turn about an axis beneath the box, a stop secured to the upper side of the box, and oppositely-disposed latches pivoted to the body and engaging said stop, said latches operating to hold the box from movement in either direction.

24. In a dumping-car, a body, a box pivoted thereto to turn about an axis beneath the box, a stop secured to the upper side of the box, and oppositely-disposed latches pivoted to the body and engaging said stop, the noses of said latches inclining upward from the stop whereby a lever may be inserted under the nose to release the latch from the stop.

25. In a dumping-car, a body, a box pivoted

thereto to turn about an axis beneath the box, a projection secured to the upper side of the box, oppositely-disposed latches pivoted to the body and engaging said stop, said latches operating to hold the box from movement in either direction, and supporting-struts pivoted to the ends of the latches, said struts operating to hold the latches out of contact with the projections.

26. A box for a dumping-car, having an open side, a removable door adapted to close said open side, said door engaging the box at its lower edge, but being spaced therefrom at its upper edge to form a triangular opening between the box end and door, supporting-hooks at the upper edge of the door, and lugs on the box, adapted to be engaged by said hooks, said door having flanges at its ends to close the triangular opening.

27. In a dumping-car, a body, a box pivoted thereon, and manually-operated jack mechanism for turning the box about its pivot, said mechanism including a jack-lever pivoted to a fixed portion of the body.

28. In a dumping-car, a body, a box pivotally mounted thereon to turn about a fixed axis, and manually-operated jack mechanism having a fixed position on the body and adapted to engage the box whereby the box may be turned about its pivot.

29. In a dumping-car, a body, a box pivotally mounted thereon, a jack-bar on one of said parts, and a jack on the other of said parts, said jack including jaws cooperating with the bar.

30. In a dumping-car, a body, a box pivotally supported thereon, a jack-bar on one of said parts, and a jack removably supported on the other of said parts and comprising jaws cooperating with said bar.

31. In a dumping-car, a body, a box pivotally mounted thereon, and a removably-supported manually-operated jack mechanism for turning the box about its pivot, said mechanism including a pivoted jack-lever, and jaws operated thereby.

32. In a dumping-car, a body, a box pivoted thereon, manually-operated jack mechanism removably supported in a fixed position on the body and adapted to engage the box, whereby the box may be turned about its pivot.

33. In a dumping-car, a body having vertical frames at its ends, a tipping box between said frames and mounted to turn about an axis beneath the box, and jack mechanism for tipping the box, said jack mechanism being removably mounted on the upper portion of one of the frames.

34. In a dumping-car, a body, a box pivoted thereon, a jack-bar secured to the box, said jack-bar being bent on the arc of a circle whose center is the axis of the box, and a jack on the body and adapted to engage said bar, whereby the box may be tilted.

35. In a dumping-car, a body, a box pivotally supported thereon to turn about a fixed

- axis, and a reversible jack removably supported in a fixed position on said body, and adapted to engage the box end whereby the box may be tipped in either direction.
- 5 36. In a dumping-car, a body, a box pivotally supported thereon, a jack-bar secured to the box, said jack-bar being bent on the arc of a circle whose center is the axis of the box, and a removable jack mounted on the 10 body and engaging said jack-bar.
37. In a dumping-car, a body, a box pivotally supported thereon, a jack mounted on the body and engaging the box end, said jack operating to tip the box, and a brake device 15 connected with the jack, whereby the movements of the box may be controlled.
38. In a dumping-car, a body having vertical frames at its ends, a tipping box between said frames and mounted to turn about an 20 axis beneath the box, a jack mounted on the upper portion of one of said frames and engaging the box end, and a shield pivoted to said frame and adapted to cover the jack.
39. In a dumping-car, a body having vertical frames at its ends, a tipping box between 25 said frames and mounted to turn about an axis beneath the box, a jack mounted on the upper portion of one of said frames and engaging the box end, and a shield pivoted to 30 said frame and adapted to cover the jack, and means connected with the shield and adapted to engage and lock the jack when said shield is closed.
40. In a dumping-car, a body having vertical frames at its ends, a tipping box between 35 said frames and mounted to turn about an axis beneath the box, a jack mounted on the upper portion of one of said frames and engaging the box ends, and a combined shield 40 and lock for the jack.
41. In a dumping-car, a body having transverse vertical frames, a tipping box between said frames, and turning about an axis beneath the box, latches pivoted to the upper 45 portion of said frames, and adapted to engage the box, a jack also supported on said frames and adapted to engage the box, and a pivoted shield or cover for said latches and jack, said cover having means to engage and 50 lock both the latches and jack when said cover is closed.
42. In a dumping-car, a body having transverse vertical frames, a tipping box between 55 said frames, and fixed shields supported on said frames and covering the space between the frames and box.
43. In a car, a fixed body comprising longitudinally-extending sills, transverse end sills, longitudinally-braced transverse frames 60 rising from said sills, and longitudinal tie-rods connecting said end sills, combined with a tipping box supported on said sills between the said frames.
44. In a car, a fixed body comprising longitudinal sills, transverse end sills, longitudinally-braced transverse frames rising from 65 said sills, means to truss said longitudinal sills both longitudinally and transversely, combined with a tipping box supported between said frames. 70
45. In a car, a fixed body comprising longitudinal sills, transverse end sills, longitudinally-braced transverse frames rising from said sills, longitudinal tie-rods connecting 75 said sills, combined with a tipping box supported on said sills between said frames, said box having an axis-bar secured to the under side thereof and resting upon one of the sills, said longitudinal tie-rods being situated 80 either side of said axis-bar and central of the ends of the sills.
46. In a car, a body comprising longitudinal sills, transverse end sills, a plurality of pairs of truss-rods connecting said end sills, one pair of truss-rods having the central portions thereof carried toward the center of the 85 car whereby said car is braced both longitudinally and transversely.
47. A box for a dumping-car, said box having an open side, a door to close said open 90 side, the upper edge of said door being spaced from the box ends, and means to lock said door against lateral movement.
48. In a dumping-car, a body having fixed vertical frames rising therefrom, a tipping 95 box supported between said frames, a jack mechanism to tip said box and means on the frames for controlling the tipping movement.
49. In a dumping-car, a body having fixed vertical frames rising therefrom, a tipping 100 box supported between said frames, means to tip said box, and a manually-operated brake mechanism on the frames for controlling the tipping movement of said box.
50. In a dumping-car, a body having fixed 105 transverse frames rising therefrom, a tipping box supported between said frames, and shields pivoted to the frames to turn about an axis parallel to the box-axis, said shields when closed operating to partially close the 110 space between the box and frames.
51. In a dumping-car, a body having fixed transverse frames rising therefrom, a tipping box supported between said frames, shields pivoted to said frames and adapted to close 115 the space between the box and frame, and a stop-rod pivoted to the frame and engaging each shield, said stop-rod operating to lock said shield in its open position.
52. In a dumping-car, a body having fixed 120 transverse frames rising therefrom, a tipping box supported between said frames to turn about an axis beneath said box, and means to tip said box, said frames having their upper ends formed to afford safe standing-room 125 for the operator.
53. In a dumping-car, a body having fixed transverse frames rising therefrom, a tipping box supported between said frames to turn about and beneath the box, jack mechanism 130 at the upper ends of the frames for tipping said box, said frames having their upper ends formed to afford safe standing-room for the operator.

54. In a dumping-car, a body, a box pivoted thereto to turn about an axis beneath the box, a projection on said box and oppositely-disposed latches pivoted to a fixed support and adapted to engage said projection, said latches having inclined surfaces under which the projection passes as the box is brought into its upright position.

55. In a dumping-car, a body having fixed transverse frames rising therefrom, a tipping box supported between said frames, and jack mechanism to tip said box, said jack mechanism having a fixed position on one of said frames and being removably supported thereon.

56. In a dumping-car, a body, a tipping box supported thereon, jack mechanism carried by the body and operating to tip the box, said jack mechanism including a plurality of

jaws, a pivoted member on which said jaws are secured, said member having a socket, and an operating-lever removably sustained in said socket.

57. In a dumping-car, a body, a box pivotally mounted thereon, and manually-operated jack mechanism to turn the box about its pivot, said mechanism including an oscillatory jack-lever, and means between said lever and the box whereby the oscillatory movement of the lever operates to give the box a continuous tipping movement.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CALEB D. PAGE.

Witnesses:

LOUIS C. SMITH,
GEO. W. GREGORY.